THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF INFORMATION, COMMUNICATION AND INFORMATION TECHNOLOGY

TANZANIA COMMUNICATIONS REGULATORY AUTHOURITY

National Emergency Telecommunication Plan

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National Emergency Telecommunication Plan

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ABBREVIATIONS

CAP	Common Alerting Protocols
CRASA	Communications Regulators' Association of Southern Africa
DMD	Department of Disaster Management
EGA	Electronic Government Authority
EOCC	Emergency Operational and Communication Centre
EWS	Early Warning System
GST	Geological Survey of Tanzania
ICT	Information and Communication Technology
IOC	Intelligent Operations Centre
ISP	Internet Service Operators
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union -Telecommunication Standardization Sector
MICIT	Ministry of Information, Communication and Information Technology
MNO	Mobile Network Operator
MDAs	Ministries, Departments and Agencies
NETP	National Emergency Telecommunication Plan
NEMC	National Environmental Management Council
NGOs	Non-Governmental Organisations
PMO	Prime Minister's Office
PPDR	Public Protection and Disaster Relief
PORALG	President's Office Regional Administration and Local Government
SADC	Southern African Development Community
SOPs	Standard Operating Procedures
TCAA	Tanzania Civil Aviation Authority
TAA	Tanzania Airport Authority
TASAC	Tanzania Shipping Agencies Corporation
TCRA	Tanzania Communications Regulatory Authority (TCRA)

TMA	Tanzania Meteorological Authority
TPDF	Tanzania People's Defence Force
TRCS	Tanzania Red Cross Society
UAV	Unmanned Aerial Vehicles
UN	United Nations
VSAT	Very Small Aperture Terminal

EXECUTIVE SUMMARY

National Emergency Telecommunication Plan (NETP) is a strategic plan developed to best manage the risk of disaster during the mitigation, preparedness, response, and recovery phase by promoting communication and information sharing across the Government, within the community at risk, and between public and private organizations.

To prevent or minimize fatalities or damage to properties and/or natural resources before, during and after disasters or emergencies, the Disaster Management Department under the Prime Minister's Office, established an Emergency Operational and Communication Centre (EOCC) with its Standard Operating Procedures (SOPs) to guide and manage the 24/7 operations. This is in acknowledgement that when disaster strikes, effective coordination and communication are essential in responding to a disaster in a faster and timely manner.

Every Disaster or Emergency stakeholder has been given roles, responsibilities, and tasks as defined by the SOP where Tanzania Communications Regulatory Authority (TCRA) role falls under Communications and Warnings. TCRA is collaborating with other stakeholders in planning and developing the NETP that would help the Department of Disaster Management (DMD) under the Prime Minister's Office (PMO) to facilitate the smooth coordination of activities during the mitigation, preparedness, response, and recovery phases.

This plan has been developed to:

i. Identify the capabilities needed by emergency responders to ensure the interoperability and availability of communication services before, during and after emergencies and identify obstacles to the deployment and utilization of communication systems.
ii. Recommend installation of essential interoperable communication systems necessary for the emergency response personnel to effectively respond to incidents of different scales and magnitudes regularly in real-time at the scene of an emergency or disaster, maintaining event situational awareness with established command and control structure. This includes recommendations for improving coordination among different stakeholders by clearly describing areas of responsibilities
iii. Set goals and timeframes for the deployment of interoperable emergency communications systems, and recommend measures that emergency response providers should employ to ensure the continued operation of communications infrastructure;

iv. Set the time by which each stakeholder expects to achieve a baseline level of national interoperable communications, and establish benchmarks to measure progress.
v. Allocate roles and responsibilities for the activation of communication alert system together with their maintenance to guarantee that it is working efficiently and effectively before, during and after disasters.

This NETP is an integral part of the National Disaster management plan as per the Disaster Management Act No 6 of 2022. The goals and objectives of NETP cannot be achieved without the support and the coordination of the stakeholders and the response team. NETP assists stakeholders to share a common strategy to compact challenges as a result of disasters and natural events. Below recommended actions will help achieve a unified vision and improve the challenges stated in Information and Communication Technology (ICT) Policy of 2016, through a collective effort to allow emergency responders to communicate as needed on-demand before, during and after disaster or emergencies.

1. INTRODUCTION

Tanzania like any other country is prone to several natural and manmade hazards. The impacts of these hazards can be devastating and actions need to be taken to minimize them. The ability of people to effectively communicate during disaster or emergency is important to our safety and security, as it will minimize the loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption during the disaster.

In light of recent disasters, it has become apparent that there is a need for improving the present communication framework concerning communications during disasters or emergencies. The issue of insufficient telecommunication capabilities and coordination of emergency telecommunications received national attention in many series of events including that of the 2011 Dar es Salaam explosions that occurred in Gongo la Mboto and Mbagala. The lack of an effective and efficient communication plan led to the inability to deliver warning messages to the public in times of disaster.

Because of these factors, the Government has come up with the Disaster Management Policy of 2004 that aims to achieve a safer, more resilient and sustainable Tanzania. The goal of the policy can be reached by the empowerment of communities and institutions so that they can take appropriate action to prevent and mitigate disaster risks and vulnerabilities that result in the reduction of loss of life and injury, property damage and environmental degradation.

The Disaster Management Act No 6 of 2022 provides for the establishment of a Disaster Management Agency, disaster risk management, and coordination mechanism for disaster prevention, mitigation, preparedness, response, and recovery. The Disaster Management Department under the Prime Minister's Office, established an Emergency Operational and Communication Centre (EOCC) with its Standard Operating Procedures (SOPs) to guide and manage the 24/7 operations.

All these efforts are in acknowledgment that when disaster strikes, effective coordination and communication are essential in responding to the disaster in a faster and timely manner. Telecommunication plays a crucial role in every natural disaster. The availability of an effective telecommunication system is indispensable in saving lives during a disaster.

In the SOP, the Tanzania Communications Regulatory Authority (TCRA) has been given the role of Communications and Warnings. It is in this light that TCRA collaborating with stakeholders to plan and develop the National Emergency Telecommunication Plan (NETP) that would help the country manage the risk of disasters.

1.1 Purpose of the National Emergency Telecommunication Plan

Tanzania's National ICT policy of 2016 promotes the use of ICT in disaster management by mandating the Government to first ensure a conducive environment for the effective use of ICT for disaster management and secondly to strengthen cooperation with relevant regional and international organizations in promoting the use of ICT for disaster management.

The policy also highlights the challenges of ICT in disaster management such as the lack of a national framework for use of ICT facilities for disaster management, inadequate capacity in using ICT to handle disasters and in the accessibility of channels for disaster warning, especially in a remote area.

NETP is a strategic plan developed to best manage the risk of disaster during the mitigation, preparedness, response, and recovery phase by promoting communication and information sharing across Governments entities, within the community at risk, and between public and private organizations. The effective management of disaster depends on the timely and effective delivery of information to those who need it in as close to real-time as possible[1].

As a result, this plan has been developed to:

i. Identify the capabilities needed by emergency responders to ensure the interoperability and availability of communication services before, during and after emergencies and identify obstacles to the deployment and utilization of communication systems.
ii. Recommend installation of essential interoperable communication systems necessary for the emergency response personnel to effectively respond to incidents of different scales and magnitudes regularly in real-time at the scene of an emergency or disaster, maintaining event situational awareness with established command and control structure. This includes recommendations for improving coordination among different stakeholders by clearly describing areas of responsibilities
iii. Set goals and timeframes for the deployment of interoperable emergency communications systems, and recommend measures that emergency response providers should employ to ensure the continued operation of communications infrastructure;
iv. Set the time by which each stakeholder expects to achieve a baseline level of national interoperable communications, and establish benchmarks to measure progress.

[1] Global Guidelines to Develop National Emergency Telecommunication Plans, ITU 2019

v. Allocate roles and responsibilities for the activation of communication alert systems together with their maintenance to guarantee that it is working efficiently and effectively before, during and after disasters.

1.2 Scope of the National Emergency Telecommunication Plan

NETP covers emergency telecommunication needs in the country at every level of government, private sector and non-governmental organizations ensuring the ability for emergency responders to exchange information through voice, data, and video in any possible means during an emergency or disaster is guaranteed. The NETP aims at making sure that stakeholders can communicate in a faultless telecommunication system to manage emergency response, establish command and control, maintain situational awareness and function under a common operating figure, for a broad scale of incidents. NETP consist of four primary elements:

i. **Operability** - The ability of emergency responders to establish and sustain communications in support of communication systems.

ii. **Interoperability** - The ability of emergency responders to communicate among disciplines and levels of government, using a range of frequency bands, as needed and authorized.

iii. **Continuity of Communications** - The ability of emergency response agencies to maintain communications in the event of damage to or destruction of the primary infrastructure.

iv. **Warnings** - The ability of service providers and stakeholders to provide the necessary telecommunication warning system needed.

1.3 Goals of the National Emergency Telecommunication Plan

A set of goals have been established to allow a minimum level of interoperable communications. The goals do provide the initial set of operations on emergency communication that can be expanded further through stakeholder engagements. The goals of this NETP are as follows;

i. All places in the country should be able to receive warning alerts in all media of communication (radio, television, social media and phones) as soon as the warning is activated in the respective area.

ii. In case of failure in the telecommunication infrastructure in an affected area, minimum service restoration should be within a minimum period preferably 24 hours.

iii. All emergency responders and the public should be able to demonstrate response-level emergency communications events.

1.4 Objectives of the National Emergency Telecommunication Plan

NETP's main objective is to provide guidance that will lead to the improvement of the country's emergency communications. To achieve that the following objectives are earmarked;

1.4.1 Develop and formalize a decision-making structure with clearly defined roles for coordinating emergency communications capabilities during disasters

During an emergency/disaster, a single entity or an individual cannot be in charge of the response without collaborating with others. Therefore, all entities need to have a planned and developed means which will be used for ensure effective and fully coordinated preparedness response between people, organizations and operators.

a) Needs & Gaps to Drive Action

i. Looking at the past events like explosions that occurred in Gongo la Mboto, Dar es Salaam, 2011; emergence response agency had no proper coordination with other entities including communication operators, which led to poor communication among people leading to a more panicking state. Currently, in Tanzania, there is no automated structured communication system between different key players during an emergency.

ii. Some stakeholders do not consider planning for communications as a priority and therefore do not allocate their resources for participation in planning activities.

b) Initiatives to address Needs & Gaps

i. Facilitate the development of an effective structure of responders (government, agencies, operators, people, and other entities) and designated emergency communications roles which clearly define who is responsible for the issuance of national/regional /district/ ward/ village warnings, irrespective of the source of the warning signal and the procedures to be followed to the public level in an automated manner.

ii. Develop policies and guidelines that promote the participation and coordination of all people and media that are involved in the planning process, combined training, exercises and resource sharing for emergencies.

1.4.2 Enhance the capability of communication systems (Radio, TV, and Telecom) by integrating and improving Service Providers' response to emergencies/disaster.

Currently, in Tanzania's media (TV, radio, and Telecom) have not integrated means of communication during disasters, the EOCC is not integrated with the communication equipment in the way that during a disaster or emergency, the responders cannot quickly share information with the public through these media hence leading to delay in information sharing.

Improvement will be obtained through standards implementation, development, testing, and evaluation of the systems so that the country will have an integrated preparedness, mitigation, response, and recovery capability to communicate during disasters.

a) Needs & Gaps Driving Action
   i. Service providers have not included emergence response technologies in their communication services and there is no appropriate coordination between service providers and the EOCC.
   ii. The public broadcast media (radio & TV) can provide up-to-date information but the information is not always delivered on time.

b) Initiatives to address Needs & Gaps
   i. There is a need to develop, test and evaluate voice, video, SMS and data solutions that need to be incorporated into communication equipment to be used during emergencies or disasters.
   ii. PMO –DMD to have a specific emergency number and full functioning call centre that will be responding to all emergency /disaster incidences and communicating appropriately to responsible agencies.

1.4.3 To ensure that emergency responders can communicate in the event that the primary communication is disturbed

This may require operators to isolate the systems that have a fault and provide an integrated preparedness, mitigation, response and recovery capability communication in an emergency/disaster. There is a need to develop policies and guidelines that promote the coordination and sharing of infrastructure resources. This will greatly assist in a situation when one operator fails and then can make use of the infrastructure of the other operator in an emergency. Furthermore, consideration needs to be done on

telecommunications/ICT licensing or approvals when deemed necessary to support emergency telecommunications /ICT efforts.

a) Needs & Gaps Driving Action

i. The current regulation of infrastructure sharing does not include the active sharing of infrastructure during emergencies or disasters.

ii. The current licensing framework does not allow/provide flexibility in granting on an expedited basis telecommunication service licence.

b) Initiatives to address Needs & Gaps

i. Amend the regulation on infrastructure sharing and put conditions in which when one operator fails during a disaster may be allowed to actively use the infrastructure of the other operator.

ii. Consider National Roaming in a time of disaster.

iii. Streamline or facilitate temporary licenses and type approvals

- Allow a flexible, exceptional expedited licensing procedure free of charge, for use in emergencies/disasters.
- Licenses should be temporary and valid only until the Government has determined that communications networks are restored to response areas and there is no further need for the temporary/redundant service being provided.

iv. Type Approval Certificates

- During disaster response and recovery, type approval requirements for telecommunication/ICT critical equipment can be waived
- Regulatory authorities can recognize foreign-type approvals to expedite the process including by utilizing the guidelines of the ITU Telecommunication Standardization Sector (ITU-T)

v. Importation of equipment

Rules could be in place to:

- Prioritize incoming communications equipment as being essential to response;
- Expedite the importation process of critical telecommunication/ICT equipment for disaster response;
- Exemptions from duties and tariffs, clear expedited processes and streamlined paperwork;
- Have expedited procedures that allow the equipment to be returned to the place of origin.

1.4.4 To provide adequate, continuous training and practise emergency sessions

Emergency responders, agencies and service providers need to do training frequently and practice their resources and how to operate them in emergencies so that they can all have a shared approach, enhanced response and improved technical expertise capabilities. Training and exercises play a very important role in preparedness, readiness, and proficiency in accessing and using communications capabilities during emergency events.

a) Needs & Gaps Driving Action

There is a need for a coordinated drill/exercise for all actors involved in emergency response.

b) Initiatives to address Needs & Gaps

A plan should be put in place for developing training and simulation exercises to convey appropriate knowledge to all emergency responders and actors. This will build competency and awareness in responding to emergency incidents.

1.4.5 International Collaboration

The country needs to take advantage of the existing framework of International Organisations such as ITU for disaster-related issues.

The radio frequency spectrum is a key element in any national disaster management plan. At the regional level, Communications Regulators' Association of Southern Africa (CRASA) members identified the need to harmonise through the Southern African Development Community (SADC) appropriate frequency bands for addressing Public Protection and Disaster Relief (PPDR) requirements. SADC harmonised framework for radio frequencies for PPDR has been developed to allow SADC members to be able to support each other during such disasters on a coordinated and planned basis.

a) Need and Gap Driving Action

i. Tanzania has not yet ratified the Tampere Convention. The ratification of the Tampere agreement will:
    a) Facilitate widespread use of terrestrial and satellite communications facilities to predict, monitor and respond to major disasters throughout the world;

b) Provide the mechanism within the United Nations Disaster Relief Organisation for international sharing of communication resources, personnel and coordination of disaster relief efforts; and

c) Minimise regulatory barriers, such as customs clearance procedures and data protection laws, to the rapid dissemination of information and use of communication resources essential for disaster management.

ii. Stock taking of available compliant equipment for disaster relief.

b) Initiatives to address Needs & Gaps

i. Tanzanian Government to study and ratify the Tampere convention through the incorporation of its provisions into the relevant national telecommunications/ICT legislation and regulations.

ii. Perform the stock-taking of available equipment and have a framework in place that ensure equipment earmarked to be used during the disaster are PPDR band compliant.

2. ROLE OF TELECOMMUNICATIONS IN DISASTER MANAGEMENT

The Disaster Management process consists of four phases[2] mitigation, preparedness, response and relief, recovery and rehabilitation as indicated in **Figure 1.** Telecommunications are critical at all phases of disaster management. This chapter explains the role of Telecommunication/ICTs in every phase during disaster management and disaster risk reduction.

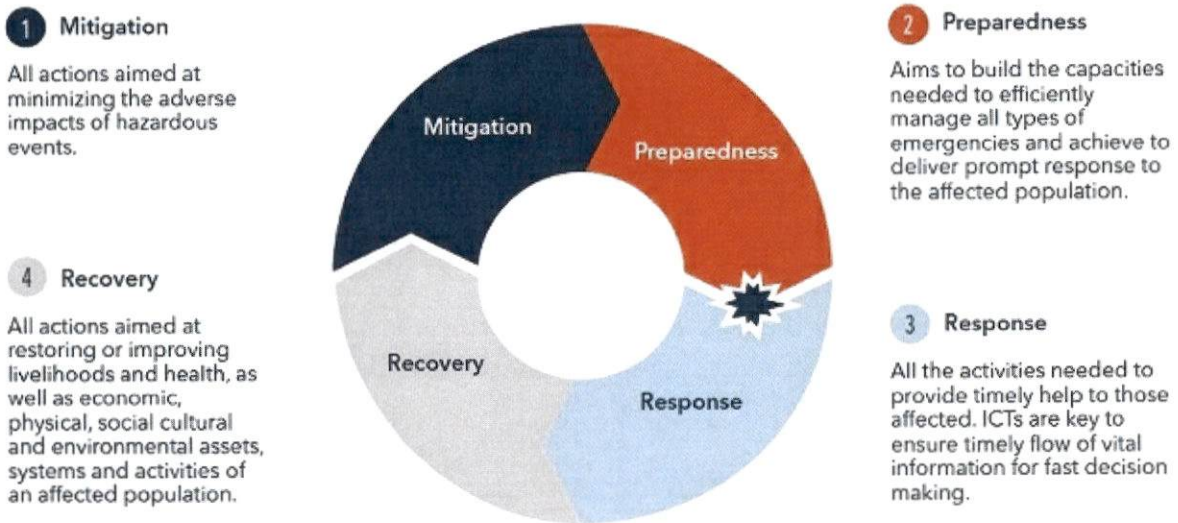

Figure 1: Disaster Management Phases[3]

2.1 Application of Telecommunication in Disaster Mitigation

This phase comprises the activities that seek to prevent disaster or emergency, reduce the likelihood of its occurrence, or limit the negative effects of unavoidable threats. These activities are short-term and long-term multi-sectoral measures to protect human life and reduce or mitigate the damage that could be caused by a disaster or state of emergency. They include;

a) Preparation of the country's updated natural disaster and vulnerability maps/profiles,
b) Vulnerability analysis of critical Telecoms/ICT infrastructure;
c) Improvement of resilience in Telecoms/ICT networks;

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[2] The disaster risk management process adopted internationally by United Nations Office for Disaster Risk Reduction (UNDRR) consists of these four phases. See European Commission, United Nations Development Group and World Bank (2013)

[3] ITU

d) Preparation of legal and regulatory framework to support emergency telecoms/ICT services e.g. regulations, and guidelines;
e) Allocation of financial resources; and
f) Establishment of Public-Private Partnership

2.1.1 Disaster Profiles in Tanzania

In general, a disaster is defined as an unforeseen event that causes great damage, destruction, and human suffering that overwhelms local capacity, necessitating a request at a national or international level for external assistance.

Disasters can be classified into three broad categories: natural disasters, technological disasters, and manmade disasters.

First, natural disasters are divided into three subgroups namely hydro-meteorological disasters including floods, storms, droughts, wind storms, landslides and mudflow; Geophysical disasters including earthquakes, tsunamis, and volcanic eruptions; and Biological disasters such as pandemics (e.g. COVID 19), epidemics (e.g. Cholera), insect infestations and wild animals/plants infestations;

Second, technological disasters are mainly composed of two subgroups: (1) industrial accidents such as chemical spills, collapses of industrial infrastructures, fires, and radiation, and (2) transport accidents by air, rail, road, or water.

Finally, manmade disasters, are disasters composed of two subcategories: (1) economic crises including collapse, hyperinflation, and financial and/or currency crisis, and (2) violence such as terrorism, civil strife, riots, and wars; and call for international assistance. Tanzania is mostly hit by natural disasters.

Figure 2 below provides the number of natural disasters by type for the last two decades from 1997 to 2017 in Tanzania. The figure shows that a large number of fatalities resulted from epidemic disasters which accounted for about 92% of the total disaster deaths. Droughts, on the other hand, affected a larger number of people where 91% of the cases were due to drought.

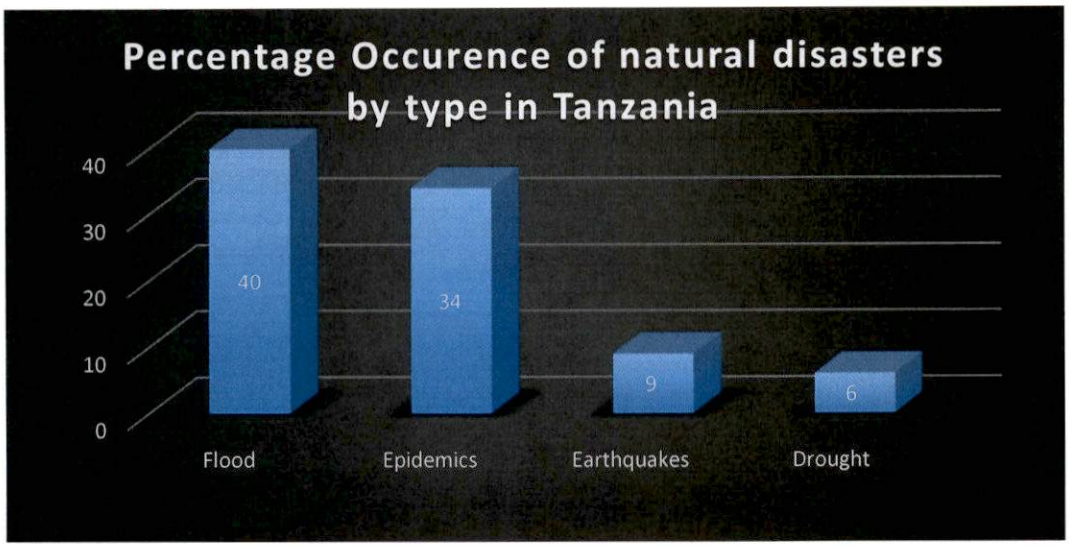

Figure 2: Occurrence of natural disasters by type in Tanzania in the last two decades from 1997 to 2017

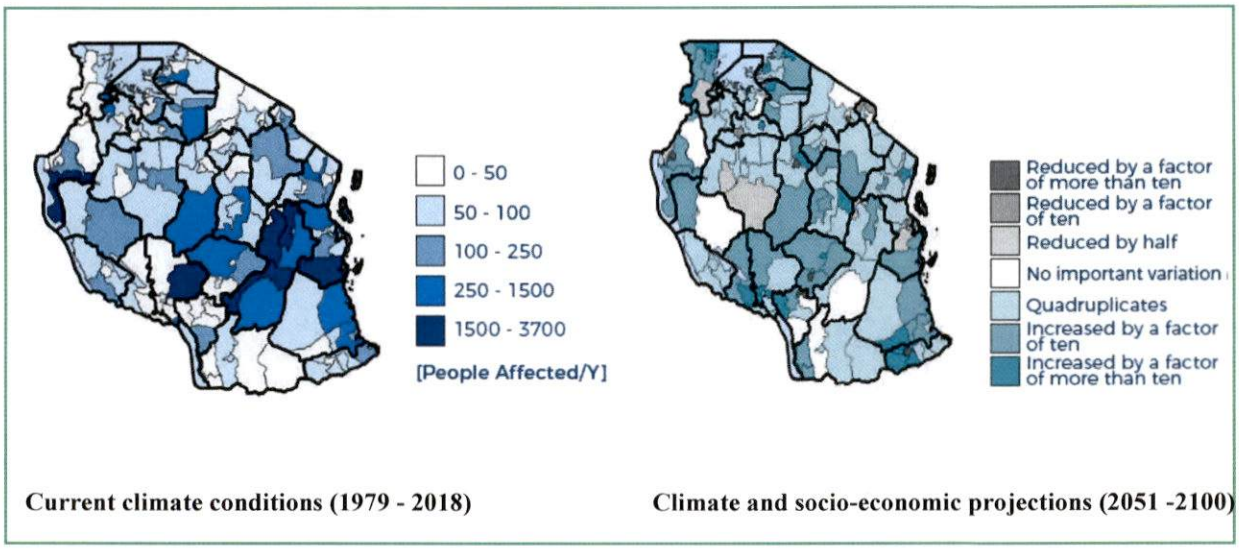

Figure 3: Population affected by floods under present and future climate conditions

(Source: PMO, UNDRR and CIMA, 2019)

Tanzania is classified as the 51st out of 180 countries in the world risk index to natural disasters. The total population is approximately 61.7 million[4], with a population growth rate of around three percent. Tanzania is one of the least prepared according to the Notre Dame-Global Adaptation Index (ND-GAIN). It is ranked 138th out of 182 countries due to its high vulnerability to climate disruptions (2016). The country is ranked 145th out of 182 countries in adaptive capacity. It has a low ability to leverage and convert investments to adaptation actions, as evidenced by its 153rd rank out of 192 countries in readiness.[5]

2.1.2 Risk Analysis of Critical Telecom/ICT Infrastructure

Identifying all critical telecommunication/ICT equipment/infrastructure that is prone to natural disasters, flooding, exposed to cyclones and taking measures that can help in preventing the destruction of communication infrastructure during the disaster.

2.1.3 Reducing the Vulnerability and Improving the Resilience of Telecom/ICT Network

Ensuring that all telecommunication/ICT networks are natural disaster-proof as reasonably practicable and keeping an inventory of back-up equipment that can be utilized among the providers and can be used in the event of a failure in the networks.

2.1.4 Legal and Regulatory Framework

For effective Disaster Mitigation a supportive Legal and Regulatory Framework is needed. It should allow flexibility to support continuous operation and restoration of telecommunication/ICT infrastructure. The regulatory framework should also allow for ICT and broadcasting to play their role in information dissemination to mitigate the impacts of disaster.

A. Telecom/ICT Service Licensing

To have flexibility in granting and on an expedited basis, telecommunication/ICT service licenses, e.g. the use of scarce frequency spectrum and numbering resource licenses, installation and maintenance of electronic communications equipment's licenses or approvals if deems necessary to support emergency telecommunication/ICT efforts. The exceptional expedited licensing procedures should be in place, for the use of emergency/disaster situations, the license needs to be temporary and valid only during the period of disaster response and recovery

[4] https://sensa.nbs.go.tz/
[5] https://gain.nd.edu/our-work/country-index/rankings/

until the Government has declared that there is no further need for the service being provided.

B. Radio Frequency Spectrum Planning, Allocation and Authorisations

Radio Frequency (RF) Spectrum planning and allocation are critical for all four phases of disaster/Emergency management. RF spectrum needs to be available for narrowband and wideband systems, but also for rapidly growing broadband radio communication networks.

Broadband radio communication networks allow for bandwidth-intensive applications to be available to first responders, e.g. streaming real-time video, multimedia capabilities, high-resolution maps and images. TCRA has allocated Public Protection and Disaster Relief (PPDR) spectrum for Public safety providers to use when and where it is needed on a national basis that allows multiple types of applications and services such as voice, compressed pictures or pictures, database access, alarms/alerts, location/tracking and real-time video streaming from narrowband voice services up to broadband-intensive applications.

A list of frequencies that have been assigned as part of the National Frequency Allocation Plan is indicated in Table 2

Table 2: Emergency Frequency Allocation

Frequency	Allocation
380-385 MHz paired with 390 -395 MHz	Narrowband PPDR and Wideband PPDR

C. Sharing of Infrastructure

Allowing active sharing of infrastructure or National Roaming framework to enable operators to share the resources of each other especially when a failure occurs on some links.

2.2 ICTs/Telecommunications in Disaster Preparedness Phase

This phase comprises the measures taken to enhance the abilities of individuals, communities, response teams and businesses to respond to a disaster/emergency. It also involves building the emergency management capacity to effectively prepare for, mitigate against, respond to, and recover from any hazard by planning, training, and exercising.

In this NETP, Disaster preparedness refers to measures taken to prepare for and reduce the effects of disasters aiming to save maximum lives, damages, and livelihoods during any disaster situation, enabling the affected Tanzanians population to get back to

normalcy within a short period. Preparedness activities with reference to telecommunication include;

a) Implementation of NETP;
b) Development of Standard Operating Procedures (SOP);
c) Implementation of Early Warning Systems;
d) Capacity building and training exercise; and
e) Information and knowledge sharing;
f) Implementation and use of new technologies;
g) Preparation of power back up and equipment;
h) Implementation of disaster recovery systems; and
i) Use of satellite imagery.

2.2.1 Disaster Response ICT Framework

ICT through broadcasting (radio, television), mobile communication, internet, very high frequency (VHF), and satellite communication systems (e.g. VSATs) play a major role in educating the public on the risks of a potential or impending disaster.

ICTs can be used for early disaster warning by disseminating information on an impending danger, thereby making it possible to take the necessary precautions to mitigate the impact of these disasters.

TCRA will provide coordination among operators and Emergency Operational and Communication Centre (EOCC) and integrate new operators with EOCC.

Once a valid warning message is drafted by the approved Authority and sent to EOCC; EOCC will send the message to TV and Radio stations operating in the affected area depending on the scale of the disaster. The same will also be sent to Mobile operators who will then disseminate messages alerting people on the disaster. There are two main ways to send messages to the public: by cell broadcast or by Short Messaging Services (SMS) to dedicated subscribers.

The public may notify the EOCC of any developing or occurring disaster through a special number, advertised to the public to use during an emergency.

The high-level diagram of how ICT can be an enabler in the operations of the EOCC and facilitate the flow of information between responsible entities to mitigate the disaster is indicated in Figure 4

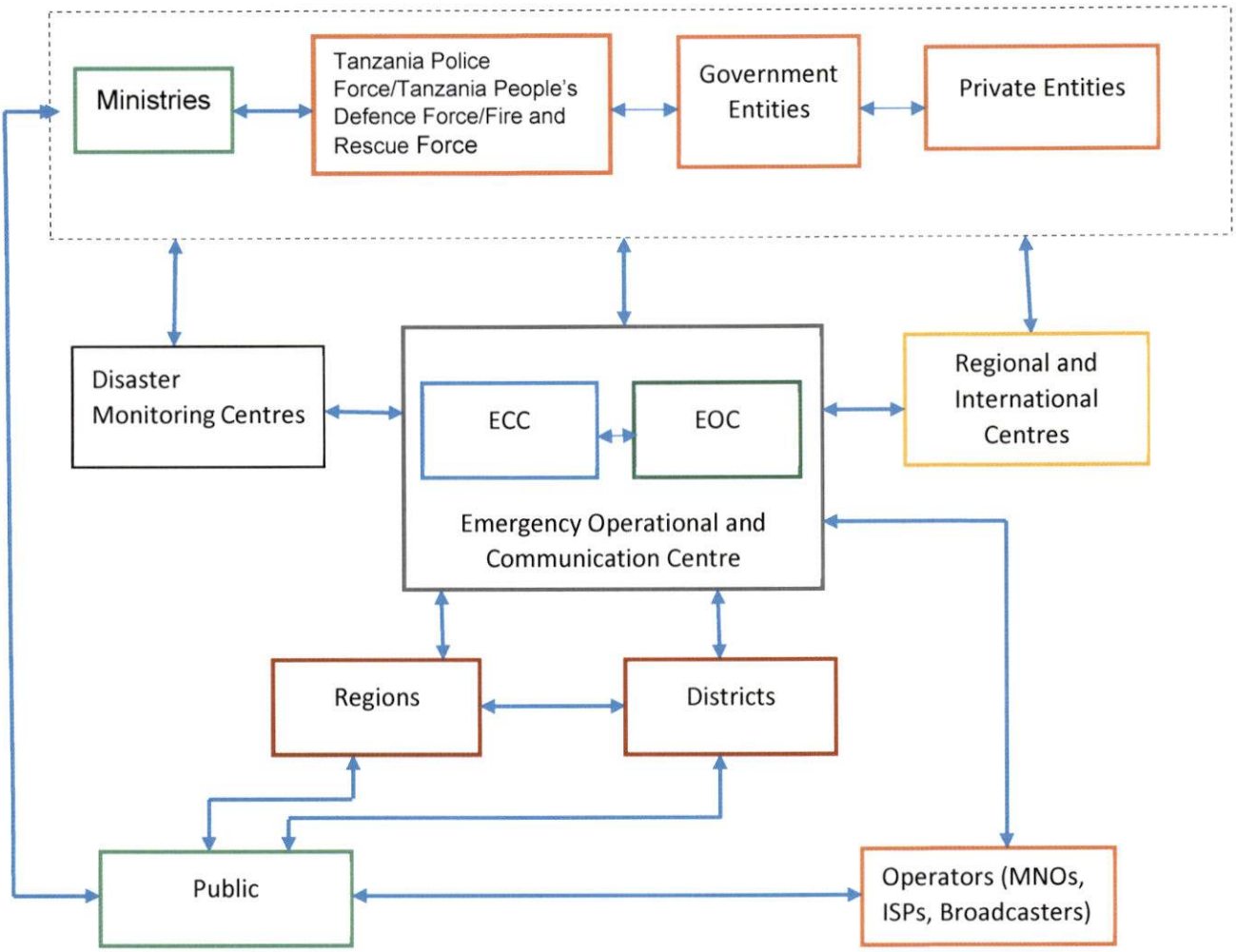

Figure 4: Disaster Response Information Framework

2.2.2 Priority Call Routing

During disasters/emergencies, networks may fail to provide service for different reasons: e.g. power outages, infrastructure collapses and overloaded networks, among others. As a result, networks become congested, delaying or altogether preventing critical communications between first responders and the community at risk. The mechanism shall be in place to allow the establishment of priority call routing on both mobile and fixed networks for people engaged in response and recovery activities during disaster/emergencies, as well as other entities and institutions involved in such activities.

2.2.3 Emergency Numbers and Equipment

TCRA has planned and reserved life and safety services which are free of charge. Fixed and mobile telephony providers should implement routing these numbers to be used during disaster/emergencies.

The assigned emergency number as per the National Numbering Plan as of July 2022 is indicated in Table 3.

Table 3: Numbering Assignment for Emergency Services

S/N	11X &19X RANGE	APPLICATION
1.	110	Emergency services for Lake Victoria and other water bodies
2.	111	Crime Stoppers
3.	112	Emergency, Police
4.	113	Anti-Corruption
5.	114	Fire and rescue services
6.	115	Ambulance Services
7.	116	Child help line
8.	117	Health help Line
9.	119	Anti-Drugs
10.	190	Disaster services
11.	199	Medical Emergency

During disaster response and recovery, Type Approval requirements for telecom/ICT critical equipment should be expedited. TCRA to expedite the Type Approvals process for imported communications equipment during disaster/emergencies.

2.2.4 Early Warning Alerts and Sensitising Systems

Early warning alerts and sensitising systems are integrated systems of hazards monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enable individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.

The early warning systems should be people-centred and will be divided into the following groups

a) Disaster risk knowledge

The general public/community at risk should be aware of key hazards and all the related threads identified in a particular area/region. Also, the role and responsibilities

of all stakeholders should be in place and the risk information should be consolidated and accessible to the general public for awareness.

b) Detection, monitoring, forecasting and analysing of hazards and possible consequences

The detection, monitoring, and warning systems should be in place and operational. There should also be an institutional framework for daily analysis of detected and monitored hazards.

c) Warning Dissemination and Communication

Communication systems and equipment for communicating early warnings should be in place for the effective dissemination of information to a targeted group. The Early Warning System (EWS) use both terrestrial and satellite services to monitor possible disasters and provide accurate and timely warnings and alerts. EWS is divided into the following groups

i. Broadcasting service i.e. Radio, Armature radio and TV broadcasting which alerts impending disasters
ii. Mobile services: distribute notifications via mobile broadcast such as sending cell broadcast messages as these operate independently of voice calls notifications will simultaneously reach multiple mobile terminals within the disaster area.
iii. Other types of a warning systems.
    a. Public address (PA) systems are connected to sensors that trigger an alarm when a specific threshold is reached. Examples of these systems are sirens and PA systems installed in risk areas.

2.2.5 Cell Broadcast for Public Warning

Cell Broadcast is a standard mobile telecommunication service that allows sending of messages from mobile towers to all mobile phone users in a given area. It allows messages to be sent and received immediately to all users and hence ideal for use for public warning in the event of life-threatening emergency. It has several advantages[6]

a) Messages a few or millions of people in under 10 seconds;
b) Supports a unique and dedicated ringtone and vibration;
c) Handled by 99% of all handsets used today;
d) Supports multiple languages, allows hyperlinks in the alert;
e) Reaches all subscribers including roaming;
f) Reaches all subscribers in their language;
g) Not affected by mobile network congestion;

[6] https://en.wikipedia.org/wiki/Cell_Broadcast

h) Not affected by data protection constraints;
i) Can address people in one cell or all cells in a city, or country;
j) Suitable for periodic public warning awareness tests;
k) It has little influence on the battery life of mobile devices.

2.2.6 Common Alerting Protocol(CAP)[7]

The Common Alerting Protocol (CAP) is a simple format for exchanging emergency alerts and public warnings in any type of network. CAP allows a warning message to be broadcasted simultaneously on many different warning systems, thereby increasing the effectiveness of the warning and simplifying the task of broadcasting that warning. CAP also provides a template for effective warning messages, based on best practices identified in academic research and real-world experience.

CAP must meet the challenge of not only timely delivering the appropriate alerts but also ensuring that they are delivered to only those who need them. CAP allows the sender to activate multiple warning messages with a single input. This enables the CAP warning to reach users through many formats such as Mobile and Land telephones, the internet (email, social media such as Facebook, twitter and WhatsApp, Internet of Things devices), sirens, broadcast television and radio, cable television, satellite direct broadcast and digital signage networks (highways signs, billboards). Figure 5 describes the CAP.

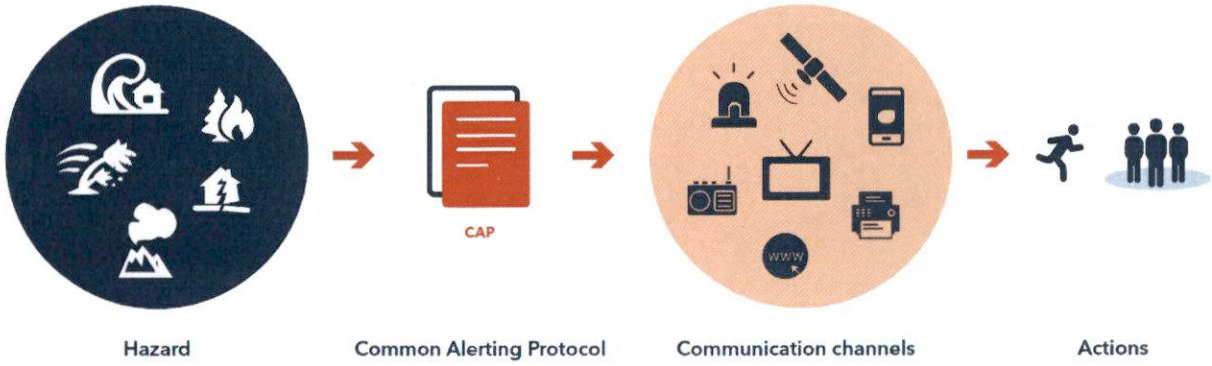

Figure 5: Common Alerting Protocol[8]

[7] Recommendation ITU-T X.1303
[8] ITU

Those alerting area data allow all manner of telecommunication/ICT components to achieve targeted alerting to people in dangerous situations:[9]

a) Mobile phones get CAP alerts through SMS or cell broadcast.
b) Online users get the CAP alert automatically if they are using a Google online service.
c) Sirens and in-home devices speak the CAP alert out loud.
d) Broadcast radio and television automatically carry the CAP alert as crawl text or audio inserts.
e) Some online users get the CAP alert as an overlay of online advertisements.
f) Drivers see the CAP alert on digital billboards along the highway.
g) Smartphones get CAP alerts through free apps such as the Red Cross Hazard App, which adds further information, such as where to find shelter and how to give first aid.

2.2.7 Preparedness and Response Capabilities

This portion makes sure disaster preparedness measures such as response plans have been developed and are operational. Also, public awareness and education campaigns are conducted.

a) Contingency Plans

Preparation in advance of operation procedures and arrangements to enable telecommunications service in some specific areas that are hit by the disaster to support continued operation and restoration of communications. The plan is based on the topology of disaster analysis and identifies the lack of telecommunication/ICT infrastructure in vulnerable regions such as prior connectivity of the site, availability of telecommunication/ICT facilities and pre-prepared communications Equipment that could be deployed in the areas vulnerable to disaster. Each telecommunication service provider needs to have a contingency plan that will have specific procedures such as;

i. Level of prior connectivity of the site
ii. Operational/available telecommunication/ICT facilities
iii. Pre-positioned equipment that could be deployed in the area
    - Power outages: on-site generators and back-up power sources and deploy portable generators
    - Avoid congestion by network traffic management if needed
    - Cellular on Wheels (COW) - mobile cell sites

9 ITU Guidelines for national emergency telecommunication plans, 2019

- Store satellite terminals (e.g. VSAT) in safe warehouses ready to be deployed

b) Network Redundancy

To have robust networks to minimize Telecommunications/ICT outages during an emergency/disaster consideration of network redundancy and resilience are key. The objective is to have initiatives that will encourage telecommunications/ICT providers to have networks with adequate redundancy and multiple connectivity backhaul options.

2.2.8 Response and Contingency Plans

A contingency plan is a synthesis of the discussions, analysis and most important decisions made during the planning process, it is also a means of communicating these ideas to people who may involve in the planning process. Table 4 indicates the response and contingency plan analysis.

Table 4: Response and Contingency Plans

No.	Contingency plan element	Main utility
1	Scenario	▪ Provide the basis for planning ▪ Useful in generation consensus on the nature of the potential crisis.
2	Response strategy	Developing appropriate humanitarian responses
3	Implementation Plan	Defining how responses will be structured and implemented programmatically and logically.
4	Operational support plan	Identifying the human resource, administration, finance, Telecoms/ICTs, security and other need of response.
5	Preparedness plan	Identify actions that can be taken before a disaster to improve response
6	Budget	Determining the cost of preparedness and response activities

2.2.9 Telecom/ICT networks for monitoring early warning and alert systems

Develop an Early Warning system with clear information and communication flows; develop and disseminate guidelines on Early Warning response from the national to the local level.

2.2.10 Telecom/ICT in Disaster Management and Risk Reduction

Disaster Management Department (DMD) in the Prime Minister's Office needs to plan to incorporate Telecoms/ICTs in all stages of the disaster management lifecycle, especially during the preparedness stage. DMD- PMO, Ministry responsible for Communications, TCRA and all other key stakeholders need to increase the effort on enhancing the resilience of communication infrastructure in the country so that to be effective in saving lives and properties when disaster strikes. The telecoms/ICTs should be used in the following area during disaster risk management to ensure that various stakeholders participate in the development, updating and sharing of information on Disaster Risk Reduction.

a) Install disaster warning systems and alert systems.
b) Development of the database for information dissemination.
c) Create GIS-based national disaster and risks maps
d) Establish tools that assess existing and potential hazards caused by climate change to vulnerable communities in Tanzania.
e) Establish a national early warning, sensors and emergency alert system to provide advice to all stakeholders of disaster management.
f) Develop Telecoms/ICTs platforms that link institutions with early warning systems installed in potentially hazardous areas.
g) Develop a National Cell Broadcast System for the Public which allows sending real-time location-specific information messages to a large number of telecom subscribers
h) Create a digitized/Intelligent Operations Centre (IOC) communication facility with automated emergency communication equipment to respond to disasters.
i) Use of Unmanned Aerial Vehicles (UAV) to provide insights into aerial view imagery on the extent of the damage to the affected area.
j) The use of satellite phones during emergencies.

2.2.11 Use of Telecom/ICTs and Broadcasting Industry to Raise Awareness

The media plays a very important role in informing and warning the public before, during and after disasters, but in the last few years, the media have also been regarded as a mediator, raising awareness of disasters and increasing disaster preparedness. The role of the media in disaster situations can be seen in the following areas.

a) The media provide disaster warnings and keep the audience updated about the situation as it unfolds before, during and after the disaster via television, radio, and social media.
b) Disseminate early warnings and advisories to allow communities to prepare for natural hazards such as floods, ahead of time

c) Media such as radio empowers survivors and vulnerable people, whose right to privacy is to be respected,
d) Media provide the right to information that should be protected even in times of emergency and disaster.
e) The media provides life-saving information.

2.2.12 Cooperation with Different Stakeholders (Public and Private)

The successful implementation of NETP needs close collaborations between different stakeholders. It also depends on the commitment of each stakeholder, be it the Government ministries, agencies or private sectors and effective communication and cooperation between telecommunication providers and the government.

DMD as the lead agency has defined the roles of each stakeholder as detailed in its SOP. However, telecommunication needs to be further categorised or subdivided so that the many stakeholders within this area are aware of their responsibilities in relationship to disaster management.

DMD will be the lead agency in defining the responsibilities and procedures for all stakeholders at various levels acting in the face of a disaster/emergency or catastrophe. The list of key stakeholders of National Disaster Management Stakeholders, their roles and responsibilities are as detailed in Table 7.

2.2.13 Training and Simulation Exercises

Training and simulation exercises are the best way to prepare teams to respond effectively to an emergency or disaster. These should be designed to engage stakeholders and get them working together to manage responses to a hypothetical incident. Pieces of training, drills, workshops and exercises enhance knowledge of plans, allow members to improve their performance and identify opportunities to improve capabilities to respond to real events with further training, workshops, and education.

Simulations are an effective tool to assist organisations and government agencies in preparedness planning and capacity building. In the context of emergency telecommunications, simulations can be designed to:[10]

a) Test national and local strategies, protocols and frameworks on the use of ICT for disaster response;
b) Increase the understanding of telecommunication regulations and their crucial role in disaster response;
c) Identify gaps and challenges that can be addressed through preparedness in the emergency telecommunication sector;
d) Increase understanding of response mechanisms;

[10] ITU Emergency telecommunications table-top simulation guide

e) Practice national/inter-agency contingency plans and/or local-specific plans in emergency preparedness and response;
f) Test new policies, procedures or equipment before incorporation into national plans;
g) Test the roles and responsibilities of key stakeholders in disaster preparedness and response, including communities and government, customs organisations, the private sector, national response agencies, local and international NGOs, civil protection, and UN agencies;
h) Test the national disaster response coordination mechanism and its coordination with other clusters at the regional level;
i) Assist national and district response management staff in their roles and responsibilities in the use of ICTs for disaster management, with a specific focus on the response phase;
j) Build an understanding of government structures and/or coordination, cooperation and communication between the Government and the humanitarian community/organizations present in the country.
k) Consider emerging risk(s) in the emergency telecommunication sector, and test coordination and information sharing among the ICT private sector;
l) Identify whether proper mechanisms, systems and resources, including early warning systems, are available in-country and at regional and global levels, to support the use of different ICT platforms and technologies for large-scale emergency response;
m) Contribute to cross-sectoral relationship building, both within the government and between other key stakeholders;
n) Apply lessons learnt, consolidate best practices identified during the simulation exercise, and identify next steps to enhance preparedness for future disasters.

2.2.14 Support for people with specific needs

Provision of education to persons with disabilities, mothers, children, elderly people, and women about life skills, self-care skills, safety and security precautions and measures, basic disaster preparedness, psychological support techniques, and malnutrition prevention measures.

2.2.15 Standard Operating Procedure (SOP)

Standard Operating Procedures (SOP) are formal written guidelines or instructions for incident response, that typically have both operational and technical components, and enable emergency responders to act in a coordinated fashion across disciplines in the event of an emergency

SOPs describe the nature and processes of information dissemination during disaster and risk situations. The dissemination of information, before, during and after a disaster is a critical aspect of preparedness and response.

The SOP guides how to disseminate continuous information to people in disaster/risk and affected populations before, during, and after a disaster. Each stakeholder involved in disaster/emergency management will have to establish its internal SOPs.

The SOPs have been defined to facilitate the provision of telecommunication to support disaster management. The SOPs are defined in **Annex** I

2.2.16 Directory

A directory of officers responsible for telecommunication services during a disaster at various levels shall be prepared for National, Regional and District levels giving their names, addresses, telephone numbers, mobile numbers, email addresses, etc. The such directory will be widely circulated and updated annually. The current directory is at **Annex** II.

2.3 Emergency and Disaster Response Phase

This phase needs the implementation of operational procedures such as message boards, and evacuation instructions, install temporary radio links, maintenance of national and international connectivity and activation of emergency alert systems. The National emergency telecommunication disaster response requires a full commitment on the part of all stakeholders involved. This needs to have a proactive attitude towards the response plan. The response plan will be activated during a disaster and will serve as the medium for communication during emergencies and disasters.

2.3.1 Declaration of the Emergency

PMO will declare an emergency or disaster to the public and government institutions through media or government magazines, as stated in the Disaster Management Act No. 6 of 2023 (32). Also, the activation of the National Emergency Preparedness and Response Plan will initiate immediately to allow each sector to respond.

In terms of the Telecommunication process, the declaration can be viewed and followed using the following flow chart shown in Figure 6 for best practice Emergency telecommunication response Operation procedures.

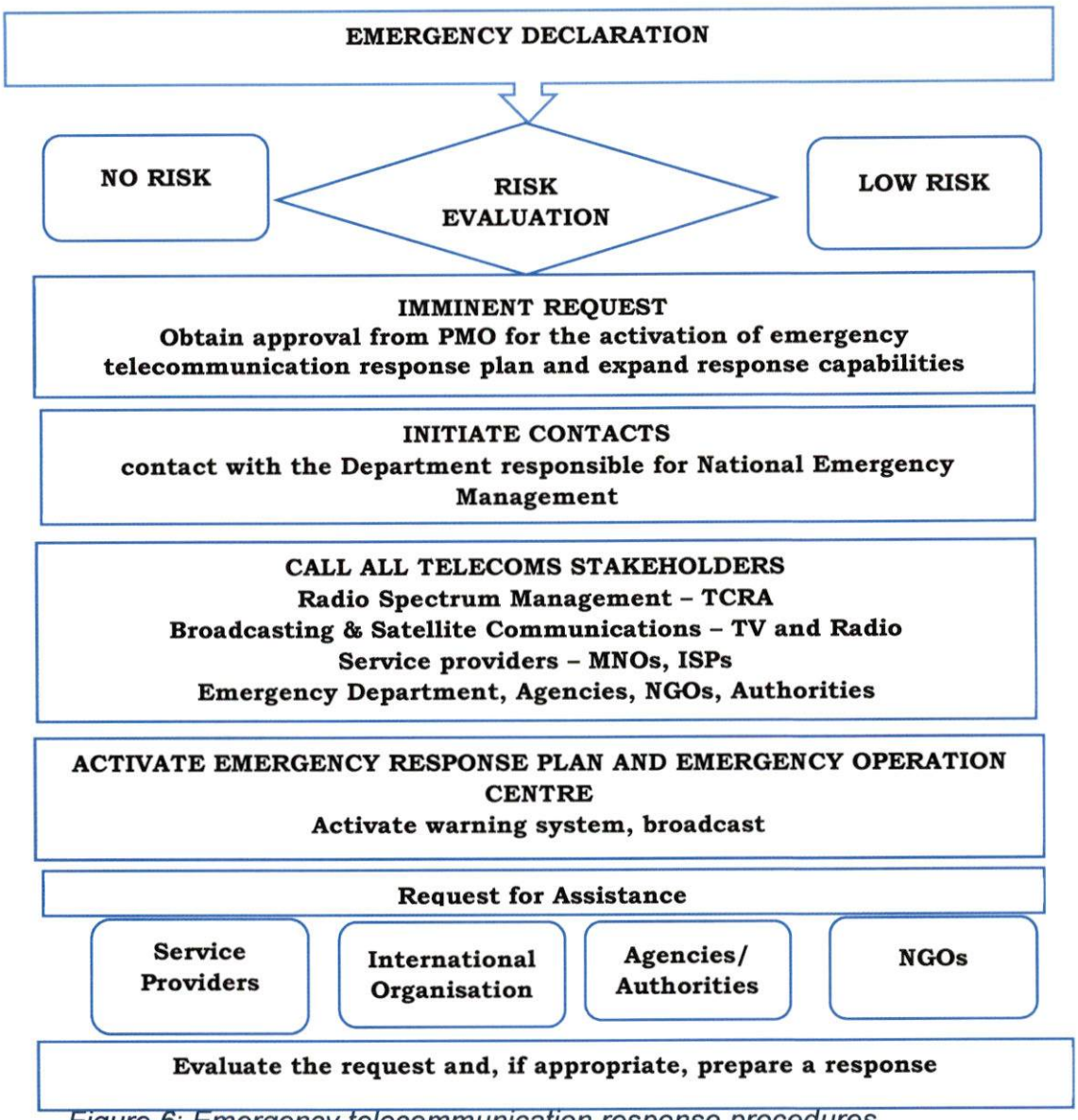

Figure 6: Emergency telecommunication response procedures

An emergency response system should be in place to ensure that the Emergency Telecommunication team works closely with the PMO-National Emergency department playing their specific roles and responsibilities. The following need to be considered to achieve this:

i. Mobilize additional resources from other entities as required e.g. radio amateurs, private sector, international organizations
ii. Respond to requests by national and international humanitarian organizations for assistance in the deployment of telecommunications resources (licensing incoming equipment and allocating requested frequencies.

iii. Provide appropriate telecommunications equipment or services for Search and Rescue officials, and those providing services such as medical care, shelter, relief, distribution of food, water supply, etc.

Emergency Telecommunication response plan puts in place the following in operation during a disaster or emergency:

i. Facilitation of communication within and outside the country,
ii. Facilitation the provision of appropriate telecommunications equipment and/or services to ensure the availability of telecommunications to meet emergency requirements, especially for the emergency responders and the telecommunication industry.
iii. Receipt and analysis of requests for additional radio frequencies, for the use of satellite earth stations or resolve unexpected radio interference problems. Urgent requests made in the time of emergency should be attended to without delay.
iv. Technical responsibility for the development and activation of the warning system may be given to the emergency telecommunications department, but the decision to activate and transmit a message is mainly the responsibility of service providers.

The detailed responsibility matrix between different stakeholders is indicated in Table 5

Table 5: Responsibility matrix after an emergency declaration

S/N	Entity	Roles and Responsibility
1	Prime Minister's Office-Disaster Management Department (DMD)	a) Activating the emergency communication and notification system; b) Approving, in conjunction with major announcements and media taken; c) Notifying agencies of the declaration of the emergency and the termination of the emergency; d) Coordinating the response; e) Declaring that the emergency has terminated;
2	Tanzania Communications Regulatory Authority (TCRA)	a) Ensuring the communication service providers are advised of the declaration and termination of an emergency and are kept informed of the emergency. b) Conduct an audit of telecommunication infrastructure to establish communication needs and ensure that operators deploy resources where they are most

S/N	Entity	Roles and Responsibility
		needed. The information must be obtained an existing telecom/ICT capacities that could be made available for emergency disaster response. Damaged infrastructure and service assessment needs to include at least the following; i. Mobile and Radio systems; ii. Emergency dispatch services iii. Status of terrestrial systems/public mobile system; iv. In-country VSAT provider availability v. Pre-positioned emergency MSS equipment vi. Internet services
3	Tanzania Police Force (TPF)	a) Establishing an ongoing communications link with the senior official at the scene of the emergency; b) Providing radio traffic control staff to facilitate the movement of emergency vehicles; c) Should be alerting people endangered by the emergency
4	Fire and Rescue Force (FRF)	a) Coordinate firefighting operations b) Establishing an ongoing communications link with the senior official at the scene of the emergency; c) Providing information and advice on firefighting and rescue matters d) Should be alerting people endangered by the emergency
5	Tanzania Metrological Agency (TMA) and	Provide weather, climate services and warnings for the safety of life and property to the general public and various users including aviation, agriculture, and food security, water resources, disaster management, health, and construction industry through telecoms and broadcasting media.
6	Geological Survey of Tanzania (GST)	Disseminate warnings on geologically related issues to the public and other entities through EOCC.

S/N	Entity	Roles and Responsibility
7	Tanzania Red Cross Society and other NGOs	Provision of first aid and coordination especially in their field of expertise
8	• Ministry responsible for Regional Administration and Local Government and concerned Disaster Management Committees (Ward and Village or Mtaa Committees) and other relevant stakeholders. • Ministry Responsible for Health, • Ministry Responsible for Livestock, • Ministry Responsible for Agriculture, • Ministry Responsible for Water, • Regional Secretariat (RS), Local Government Authorities (LGAs) and other relevant stakeholders	a) Receive warning information on disaster/emergencies. b) Alert key local officials on disaster situations. c) Disseminate warning information and instructions to the public through available warning systems. d) Disseminate warnings and instructions to special facilities such as schools, prisons, nursing homes, day care centres and hospitals.
9	Ministry Responsible for Transportation, TANROAD, TARURA, Land Transport Regulatory Authority	a) Identify local public and private transportation resources and coordinate their use in emergencies, especially in providing evacuation transportation b) Coordinate deployment of transportation equipment to support emergency operations.

S/N	Entity	Roles and Responsibility
	(LATRA), Tanzania Shipping Agency Corporation (TASAC), and Tanzania Government Flight Agency (TGFA).	c) Establish and maintain a reserve pool of drivers, maintenance personnel, spare parts, and tools. d) Assist local governments in assessing the most viable transportation routes into the impacted areas and establish alternate routes for the movement of people, goods and services.
1	Tanzania Civil Aviation Authority (TCAA), RS, LGAs, TRCS, Tanzania Police Force, Tanzania Scouts Association, UN and International/Regional Agencies, Tanzania Shipping Agency Company (TASAC), NGOs, Private Companies, Beach Management Units and Skilled Individuals, TPDF and other relevant stakeholders.	a) Coordinate and conduct search and rescue activities. b) Identify requirements for specialized resources to support rescue operations. c) Coordinate external technical assistance and equipment d) support for search and rescue operations.
1	Service Providers-(Mobile Network Operators, TV, Radio)	a) Activation of warnings and provide updates on approval from the PMO-DMD office for Disaster. b) Ensure continuity in communication, especially in the affected areas c) Addressing any action items that may result from the activation of the Emergency Response d) Maintaining records, and radio logs of all actions for debriefings and post-emergency reporting that will be prepared.

2.3.2 Gathering and analysis of data/information on immediate needs

The data/information during disaster response must well be gathered and must be precise, to help ensure vital information is provided to the public and/or to relief workers, taking account of disruptions caused by disaster events. example of the information needed is a location where rescue teams should be dispatched and critically affected

areas. In the event of disaster permission to share call detailed records (CDR) for location details information is deemed to be automatically permitted for at most two weeks.

The Telecommunications Service Providers shall submit an initial Report to TCRA as per **Annex III** about their network, and helplines and update as necessary.

2.3.3 Situation awareness and update

The response team and public should be informed of the status of the disaster-affected area by using image data from drone cameras and other responder terminals.

2.3.4 Connecting families and friends

The affected persons should be able to inform others about their condition and whereabouts by communicating with their loved ones by using IP-based messages and other disaster delivery systems. Service providers should ensure that no subscriber shall be denied access to voice / SMS communication due to any commercial consideration, whatsoever, including non-payment / insufficient balance/recharge etc. This facility shall continue for at least 15 days.

2.3.5 Resource pooling

Communication services providers should share resources including allowing national roaming (a Memorandum of Understanding/contract need to be in place) so that services will be provided to the public and priority user groups seamlessly.

2.4 Emergency and Disaster management recovery

The recovery phase focuses on providing the help needed for the community to return to pre-emergency levels of safety and functionality. During this phase, stakeholders work to restore damaged telecom/ICT infrastructure, rebuild and improve telecom/ICT network infrastructure also includes network deployments to prepare for future disasters. Telecom/ICT networks and services are used to help assess the damage and losses, the needs of the affected areas and population, identify locations in need of recovery assistance, track recovery activities, and coordinate reconstruction activities.

2.4.1 Details Damage and Needs Assessment

This section provides a standardized assessment of the direct and indirect effects of an emergency and disaster event, and their consequences on the social well-being and economic performance of the affected community or population. Assessment is based on collected data on damages from both paper and digital information sources such as survey questionnaires, press articles, and interviews with affected community.

Telecoms/ICT tools are required to rapidly and systematically assess the significance of damages and losses, help define reconstruction strategies, set up a basis on geographical terms and sectors, and help define priorities. This involves: -

a) Identify and communicate locations for recovery to assistance groups;
b) Providing a baseline to identify new hazards and/ or patterns in vulnerability;
c) Evaluate the appropriateness of redevelopment plans;
d) Identify appropriate mitigation measures for a future disaster event;
e) Identify appropriate changes in preparedness and response activities for future disasters/emergencies;
f) Provide a baseline to characterize long-term disaster impacts such as severe floods;
g) Provide a baseline by which to monitor the progress of recovery activities.

2.4.2 Rebuilding and Improving Telecom/ICTs Infrastructure

a) Restoring the damaged Telecom/ICT Infrastructure;
b) Temporary use of telephone services such as the use of satellite phones;
c) Ensuring that the electric power supply is available.

2.4.3 Incorporating Resiliency and Redundancy into Telecom/ICTs Networks

Telecom/ICTs networks such as Mobile base stations, local switches, and transmission cables such as Optical Fibre may undergo major damage during disasters or states of an emergency such as major natural disasters. To respond effectively to these post-disaster emergencies, it is important to incorporate resilience and redundancy into telecoms/ICTs infrastructures to minimize communications disruption, facilitate information-gathering and provide means of communication by employing every possible means even during emergencies. To address this challenge, the following technologies and measures should be taken into account.

a) Use of Satellite Communications

The use of portable earth stations to reach satellite and mobile phone communications should be allowed in states of emergencies or disasters.

b) In Core networks/Access networks

This objective can be achieved by:

i. Use of Spares for switching equipment and transmission facilities
ii. Having multiple routes of transmission facilities
iii. Installation of congestion detection and traffic control function

iv. Installation of automatic fire alarms and extinguisher systems
v. Secure facilities to a stable structure robust against collapse
vi. Stable outdoor facilities and solid buildings to ameliorate the effects of disasters
vii. Increase in switching capacity
viii. Emergency priority voice calls for Congestion control.

c) In Fixed Access and Terminal Equipment
- Special toll-free public phones
- Satellite mobile phones

d) In Mobile Access and Terminal Equipment
- Reduce the quality of the call for Congestion control

e) For Internet Access
- Offer Free access to wireless LAN and Internet including in evacuation centres
- Prioritize traffic for bandwidth control

f) Electric Power Supply
- Use of spare portable power supply and backup generators or batteries.

2.4.4 Identifying locations in need of recovery assistance, tracking recovery activities

Ensure coordination with providers of telecommunications infrastructure and services to attain the combined effect.

2.4.5 Coordinating Reconstruction Activities

Provide expert advice to the government concerning telecommunications infrastructure and other related projects during the reconstruction phase.

3. IMPLEMENTATION PLAN AND MEASUREMENTS

The successful implementation of this plan will be through the commitment of different stakeholders involved in the plan. Telecommunications/ICTs for Disaster Management can be summed up in four principles: multi-hazard, multi-technology, multi-phased, and multi-stakeholder. Table 6 illustrates the roles and responsibilities for the implementation of Emergency Communication.

3.1 Multi-hazard

Hazards include natural and Technological-human. Natural hazards include earthquakes, cyclones, floods, lightning, mudslides/landslide, droughts, tsunamis, volcanic eruptions, fires, and pandemic disease. Technological-human-induced hazards include fire outbreaks, building collapse, civil disorder, complex emergencies, transportation accidents oil spills, terrorism, Industrial Accidents and Explosions. For all disasters that follow natural and Technological-human hazards, ICTs play a critical role in facilitating the flow of vital information promptly.

3.2 Multi-technology

In mitigating the disastrous effects of hazards, it is advised that the country promotes the use of different information and communication technologies and networks, including satellite, HF and VHF radio, Broadcasting radio, television, fixed and wireless mobile networks, and the Internet such as social media, online televisions and newspapers, blogs, website, that can contribute to enhance capacity and reduce the vulnerability of people.

3.3 Multi-Stakeholder

Effective implementation of NETP is highly dependent on proper coordination and collaboration between all ministries, institutions, departments, Local communities, private sectors, Humanitarian Agencies, international organizations and Communities charged with the responsibility of responding in times of disaster or emergency. Co-ordination will always involve the PMO- DMD, authorities, operators, and organizations engaged whether through government or other means in helping the government of Tanzania during times of disaster or emergency. Therefore, effective ICT/Telecommunication service needs to be available to ensure coordination is achieved during a disaster or emergency.

3.4 Multi-phased

Telecommunications are critical at all stages of disaster management: mitigation, preparedness, response and relief, recovery and rehabilitation.

Table 6: Roles and responsibilities for the implementation of Emergency

S/N	Entity	Roles and Responsibility
1.	Prime Minister Office-Disaster Management Department (DMD)	a) The National focal point for coordination and communication of all disaster management and risk reduction. b) Ensure implementation of Disaster Communications Strategy c) Include more telecommunications equipment in the Emergency Operation and Communication Centre (EOCC) to be used in all phases of disaster management including an early warning. Take inventory of ICT equipment and handsets. d) Include more stakeholders at the EOCC, to coordinate preparedness and response activities at a national level, including public and private institutions/agencies. e) Ensure that all procured equipment complies with the PPDR requirements. f) Develop supervision tools for monitoring the performance of stakeholders in disaster preparedness.
2.	Ministry of Information, Communication and Information Technology	a) Providing overall Policy directives on the use of telecommunication/ICT in disaster management b) Ratify the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations c) Incorporate the Tampere Convention and incorporate its provisions into relevant national telecommunications/ICT legislation and regulations
3.	Tanzania Communications Regulatory Authority (TCRA)	a) Develop and Implements the NETP at a national level involving all the main stakeholders at a national and community level. b) Establish clear lines of responsibility for the leadership of using ICTs for disaster risk management at the

S/N	Entity	Roles and Responsibility
		national level to ensure actions are implemented and that there are accountability and predictability c) Ensure multiple ways of connections (redundancy) to the Emergency Operational and Communication Center (EOCC) to accommodate different technologies. d) Develop and adopt a regulatory framework for emergency telecommunication purposes e) Include provisions in the regulatory framework for the private sector to make available its telecommunications infrastructure and services during all phases of disaster management to facilitate and disseminate timely vital information when needed f) Develop, adopt and regularly review the emergency telecommunications plan
4.	Ministries responsible for Information, Health, Agriculture, Livestock, Water, Meteorological Authority, Geological Survey of Tanzania, Disaster Management Committees and Private Sectors	a) Maintain radio communication systems for in-house use; b) Make communication systems available for Communication emergencies; c) Maintain inventory of spare parts for radio systems; d) Conduct exercises and tests of radio communication capabilities; e) Provide PMO with frequency information; f) Maintain agreements with communication service providers for emergency repairs to communication equipment; g) Maintain countrywide networks and mutual aid systems as needed; h) Provide interoperable communication frequency channels to EOCs for use in coordinating mutual aid or joint operations with other agencies; i) Determine the impact of an emergency on communication systems and initiate repair operations; j) Utilize communication systems to pass along vital information from field units to the EOC; k) Allow PMO and other agencies as necessary to utilize communication systems, equipment, and personnel to convey emergency information; l) Implement policies concerning the use of interoperable communication systems in disasters.

S/N	Entity	Roles and Responsibility
5.	Tanzania Police Force(TPF);	a) Preservation of the peace, the maintenance of law and order, the prevention and detection of crime, the apprehension and guarding of offenders and the protection of people and their properties.
6.	Fire and Rescue Force(FRF)	a) Prevent and minimize death rates, injury to people, and damage to properties arising from fire, floods, earthquakes, road traffic accidents, and other disasters.
7.	Tanzania Peoples Defence Force (TPDF)	a) Assist civil Authorities where such assistance is required to prevent loss of life or property
8.	Tanzania Metrological Agency (TMA)	a) Carry out research and training in meteorology and climatology and other related fields, and cooperate with other institutions where appropriate, for use in socio-economic development planning b) Provide weather, and climate services and warnings for the safety of life and property to the general public and various users including aviation, agriculture and food security, water resources, disaster management, health, and construction industry;
9.	Geological Survey of Tanzania (GST)	a) Monitoring of Earthquake and Volcanic b) Disseminate warnings on the geological related disaster information to the public through EOCC
10.	PORALG (LGAs)	a) Ensure the establishment of the EOCC at a local level b) Provide training and awareness to the local community.
11.	EGA	a) Ensure all MDAs and LGAs are connected to the EOCC b) Ensure that all MDAs and LGAs' information systems are compliant with the E-Gov Act 2019
12.	Ministry of Health	a) Communicate all health-related disasters Information to the EOCC b) Provide training and awareness on health-related disaster issues to the general public
13.	TCAA	a) Conduct safety and security oversight of the aviation industry

S/N	Entity	Roles and Responsibility
		b) Connect and Communicate all disasters issues related to aviation Information to the EOCC c) Provide training and awareness on disaster issues to its Agencies (TAA, Airlines, Companies) d) Coordinate search and rescue operations of aircraft
14.	NEMC, Government Chemist Laboratory Authority and Tanzania Atomic Energy Commission	a) Connect and Communicate all environmental and chemical related disasters Information to the EOCC b) Carry out inspections and ensure corrective actions are taken if unsafe or potentially unsafe conditions are detected
15.	TASAC	a) Connect and Communicate all maritime disasters Information to the EOCC b) Coordinate all matters relating to national maritime search and rescue activities c) Disseminating information and creating awareness on matters related to maritime environment, security and safety.
16.	Other MDAs	a) Ensure compliance with national law, regulations and guidelines with regard to disaster management b) Collaborate effectively with other stakeholders on disaster management issues.
17.	Service Providers-(Mobile Network Operators, ISPs, TV, Radio)	a) Ensure telecommunication network resilience in collaboration with other stakeholders by having contingency plans example movable infrastructure such as BTSs b) Timely delivery of information to the public when disaster strikes. This can be used to deliver timely information to the public and to ensure communications at a government level when disasters strike c) Open relevant databases in support of all phases of the disaster management cycle, respecting standard exclusions such as those related to national security, data protection and privacy as prescribed by achieved by using cell broadcast, geo-fencing and using CAP capabilities d) Assist in all phases of disaster management to the extent possible through their capabilities, capacities,

S/N	Entity	Roles and Responsibility
		resources, and mandates e.g. setting up pf priority calls during a disaster e) Work closely together to take advantage of appropriate ICTs, including traditional and emerging telecommunications, to save human lives and livelihoods f) Ensure standardization/uniformity to help interoperability between communication service providers during and after the disaster. g) Each MNOs should be revising, updating and implementing its Disaster Recovery Testing Process whenever there are changes in the network topology, to enhance preparedness
18.	Tanzania Red cross Society and other NGOs	Provision and plan for first aid training and provide coordination, especially in their field of expertise
19.	International Organization and Regional Bodies-International Telecommunication Union (ITU) and Southern African Development Community (SADC)	Provide support in NETP development by specifying: a) Guidelines for stakeholders to effectively work together in using existing and emerging telecommunications/ICT technologies to save human lives, livelihoods, and property b) Periodic exercises/drills and simulations to test both system and people readiness c) Standard operating procedures for the creation and dissemination of early warning information using all means of ICTs d) Specific provisions for the community of disabled persons

3.5 Review of the Plan

Considering that communication technology is changing rapidly, the NETP shall be reviewed regularly and for at least three years. The review shall take into consideration the outputs of simulation exercises and real disasters. Furthermore, a review of Annex II shall be done annually as per section 2.2.16.

4. CONCLUSION

This National Emergency Telecommunication Plan is an integral part of the National Disaster management plan as per the Disaster Management Act No 6 of 2022. The goals and objectives of NETP cannot be achieved without the support and coordination of the stakeholders and the response team. NETP assists stakeholders to share a common strategy to combat challenges as a result of disasters and natural events. The recommended actions in this plan will help achieve a unified vision and improve challenges stated in the ICT Policy of 2016, through a collective effort to allow emergency responders to communicate as needed on-demand before, during and after disasters or emergencies.

ANNEX I: SOP FOR EMERGENCY TELECOMMUNICATIONS

1.0 INTRODUCTION

1.1 Objectives

- Coordination of national actions to ensure the provision of telecommunication support to the national, regional and district administration levels.
- Coordination of the requirement of temporary telecommunication services in the affected areas.
- Coordination for restoration of telecommunication services.

1.2 Key Entities

For effective provisioning of emergency telecommunication services and restoration of normal telecommunication services, the Ministry of Information, Communication and Information Technology (MICIT) and Tanzania Communications Regulatory Authority (TCRA) will need support from the following Ministries/Departments/Organizations:

a) Telecommunications service providers
b) Broadcasters (Radio and Television)
c) Tanzania Meteorological Authority
d) Prime Minister's Office -Disaster Management Department (DMD)
e) Tanzania Civil Aviation Authority
f) Tanzania Police Force
g) Tanzania Peoples Defence Force
h) Tanzania National Road Agency
i) Fire and Rescue Force
j) TANESCO
k) Ministry of Health
l) Ministry of Agriculture
m) GST
n) Red Cross
o) TRC
p) LATRA
q) The Wildlife & Forest Conservation Service
r) TARURA
s) TASAC

2.0 PUBLIC ALERT PROCESS

If a public warning is confirmed by the Disaster Management Department (DMD), the process will be to immediately contact the 'contact point' of each radio broadcast station, television station, online media and Mobile Network Operators (MNOs) with a requirement to immediately broadcast the pre-recorded Alert Message. The alert messages need to be designed to specifically suit different technologies and services available.

2.1 Cell Broadcast

Following a formal disaster warning, the cell broadcast messaging system may be used for disseminating updates to the public. The Emergency Operation and Communication Centre (EOCC) Manager is to prepare the message (90 characters maximum) based on the information provided. Messages can be sent to cell subscribers within a defined geo-fenced area. The cell broadcast message should be shared with MNOs for dissemination to mobile phones active in the defined geo-fenced area.

2.2 Broadcast Radio and Television

Radio and Television are key elements in information dissemination. In case of formal disaster announcements, radio and television broadcasters will be required to break from usual programming to broadcast pre-recorded emergency warnings to notify their listeners and viewers that an emergency is occurring in their area. Additionally, radio and television broadcasters will announce any updates on current hazards from information provided by other organisations such as Tanzania Metrological Authority (TMA).

2.3 DMD Website

The PMO website is a key tool for communicating with the public and stakeholders. The content of the website must be updated regularly to ensure that members of the public and the DMD's partners are provided with officially authorized information. The PMO website address is: www.pmo.go.tz

2.4 Social Media Channels (Facebook, Twitter, Instagram, YouTube and Blog)

The PMO's social media presence is another channel that will allow the Head of Government Communication Unit HGCU to stay in touch with the people inside and outside of the affected area. Social media is an important information source for the public.

The PMO Facebook page, Twitter account, Instagram account, YouTube and blog are managed by HGCU. The Information Officer (IO) is responsible for ensuring that material has been cleared before it is posted on the PMO's social media channels. The IO is

responsible for removing access when a person leaves or no longer requires access as part of their job.

Facebook

The PMO's Facebook page is primarily a one-way broadcast from the DMD to the public, although comments can be posted by the public on the PMO's Facebook page. The page is managed by the HGCU. The PMO Facebook account is: OWM Sera Bunge Uratibu

Twitter

The PMO's Twitter handle is: Ofisi ya Waziri Mkuu Sera Bunge na Uratibu @OWM_SBU and is managed by the Head of Government Communication Unit.

Instagram account

The PMO's Instagram account is; ofisi_ya _waziri_mkuu_sbu. The account is managed by the Head of the Government Communication Unit.

YouTube account

The PMO's YouTube account is; URATIBU_ONLINE_TIVE.The account is managed by the Head of the Government Communication Unit.

Blog

The PMO's blog is; wazirimkuu.blogspot.com. The page is managed by the Head of Government Communication Unit (HGCU).

3.0 RADIO COMMUNICATIONS (VHF, HF)

3.1 HF and VHF Radio

A two-way radio allows the operator to have a conversation with other two-way radios operating on the same radio frequency (channel). Unlike other communication systems (such as a mobile phone), messages over the HF and VHF radio system are not private and can be heard by other people listening to the same radio channel. Messages by HF and VHF radio should be brief and to the point so that the channel does not get cluttered.

Infrastructure and equipment at the disposal of DMD;

SN	Equipment/Infrastructure	Location	Quantity
1.	HF fixed base station		
2.	VHF fixed base station		
3.	VHF vehicle radio		

4.	VHF water rescue vessels radio		
5.	VHF air rescue equipment radios		
6.	Handheld VHF radios	Not Applicable	

Specific channels have been reserved to be used exclusively for contacting designated stakeholders in case of disaster. The current channel frequencies programmed into the HF radio base station in the EOCC Communications are as follows;

Organisation	**HF Frequency**	**Channel Number: Name**	**Channel Description**
EOCC			
Red Cross			
Health			
TMA			
Ambulance			
Police			
Fire and Rescue Force			
TPDF			
GST			
TASAC			
TCAA			
TAA			
TANESCO			

The VHF channel frequencies programmed in the VHF radio at the EOCC communication room and vehicles are as follows;

VHF Channel	**Tx (MHz)**	**Rx (MHz)**	**Channel Description**
EOCC			
Operational Cluster			Police, Fire, Ambulance,

3.2 Test Schedule:

Every month, the Communications Officer should initiate radio checks with all stations in its network (VHF and HF). This testing helps to ensure that the system is functioning as expected.

The radio check test schedule should be prepared by the Communications Officer and all other parties (e.g. TMA, Police, Fire) to be contacted in the monthly radio check should be aware to expect the radio call. Non-response to radio checks should be logged by the Communications Officer and communicated in a weekly report issued by the Communications Officer to management.

As part of the monthly radio testing, basic checks of the EOCC radios should be conducted by the Communications Officer to ensure devices are fully charged, antennas are well-maintained and the equipment is ready for immediate use.

4.0 SATELLITE COMMUNICATIONS

4.1 Satellite Phones

The EOCC is equipped with satellite phones and Broadband Global Area Network (BGAN) terminals for data connectivity. An up-to-date phonebook is in place with all the key contacts with their satellite phones and satellite phone numbers

4.2 VSAT

EOCC is equipped with .... fixed Very Small Aperture Terminal (VSAT) and ..... portable VSAT that can be deployed in emergencies

5.0 UNMANNED AERIAL SYSTEM (DRONES)

EOCC do have.... Drones..... Firefighting drones and Search & Rescue drones

ANNEX II: OFFICERS RESPONSIBLE FOR TELECOMMUNICATION SERVICES AT DISASTER MANAGEMENT CENTERS

A. Contact Details of National Emergency Operational Communication Centre

SN	Name and Designation	Alternate Name and Designation	Organisation /Company	Contact Details [Mobile Phone and Email]
1.				
2.				
3.				

EOCC should operate 24/7

B. Contact Details of National Contact persons (Regional, Districts)

SN	Name and Designation	Alternate Name and Designation	Organisation /Company	Contact Details [Mobile Phone and Email]
1.				
2.				
3.				

C. Contact Details of Communication Service Providers responsible for emergency and disaster

SN	Name and Designation	Alternate Name and Designation	Organisation /Company	Contact Details [Mobile Phone and Email]
1.				
2.				
3.				

ANNEX III: INFORMATION REPORT ON OCCURRENCES OF DISASTER

To be sent to TCRA by service providers, within a maximum of 24hrs of the occurrence of the disaster (dg@tcra.go.tz).

Date of Report:

Name of Service Provider:

A. Nature of Disaster:
B. Date and Time of Occurrence:
C. Affected Area (Number and Names of affected districts):
D. Initial Risk Assessment:

SN	Item	Present Consequences	Future Consequences	Worst case scenario
1.	Number of Priority users affected			
2.	The number of subscribers affected			
3.	Number of exchanges affected			
4.	Number of Towers (BTS) affected			
5.	Number of OFC/MW/satellite links affected			
6.	Any major switches affected			
7.	Services affected			

E. Action is taken for restoration, alternate communication backups and opening of helplines in brief:

F. Immediate resource assistance required:

G. Any other critical information

H. Next information update time/date:

Name: Contact:

Signature: Time Report Logged: