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PRESIDENT'S OFFICE REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

DAR ES SALAAM REGION

Flood Contingency Plan

October 2021

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Preface

Dar es Salaam's role as Tanzania's hub for international business is very crucial to the country's growth and development. The economic potential of the region is seen as a catalyst for the development not only of the region but of the whole country. This potential, however, also comes with the reality of disaster risks and hazards given the region's natural environment and the global threat of climate change. Flooding tops the list of the hazards that the Dar es Salaam region faces regularly, with flooding events often leaving significant damages to lives and properties in the region. It is, hence, crucial that interventions to address flooding catastrophes in Dar es Salaam be prioritized.

For this purpose, the Regional Government stands in full support of projects and programs aimed to build the preparedness and capacities of the Region to cope with and manage disasters and emergencies, especially flooding. The development of this Flood Contingency Plan for the Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT) – who acts as the Regional Government's tactical arm for emergency management operations, thus, is a very much-welcomed endeavor. We trust that the formulation and implementation of this plan will all the more strengthen the ongoing efforts of the Regional Government, thru DarMAERT, to better manage flooding incidences in Dar es Salaam, and help ensure the safety of lives and properties in the region during such disasters.

On behalf of the Regional Commissioner's Office, through the Regional Disaster Management Committee, we would like to congratulate DarMAERT for their valuable insights documented on this Flood Contingency Plan. We continue to recognize the commitment of DarMAERT to take part in the continuing development of the Region, by providing more organized and strategic emergency management services for the people of Dar es Salaam. While many improvements in the emergency management capacities of the Region are still needed, the development of this Flood Contingency Plan is a significant step to strengthening efforts of the Regional Government, thru DarMAERT, to build the Dar es Salaam region's resilience to perennial flooding.

The Regional Commissioner's Office would also like to express its gratitude to the World Bank and the Foreign Commonwealth and Development Office for the generous support they continue to provide in building the capacities of the Region to manage the disasters and risks in Dar es Salaam.

Hon. Amos Makalla
REGIONAL COMMISSIONER
Dar es Salaam

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The Flood Contingency Plan was done using a highly participative process. The active involvement of many institutions, key actors, experts, and professionals with their extensive contributions made possible the materialization of this Plan.

DarMAERT Secretariat

Mr. Salum Hamidu, DarMAERT Coordinator and Geographic Information Systems Officer – Land Planning; Mr. Rogasian Kimaryo, DarMAERT Secretary; Dr. Christopher Mnzava, DarMAERT Advisor; Mr. Masalida Zephania, Social Welfare Officer and Disaster Risk Management Expert; Ms. Upendo Charles, Information Technology Expert; Ms. Sikudhani Yotham, Disaster Risk Management Expert; Mr. Amini Mshana Ambulance Coordinator; Mr. Lawrence Mtui, Disaster Risk Management Expert; SP Desdery Rugimbana, Regional Traffic Officer Kinondoni; SP Athumani Boge Officer-in-Charge unit 999; ASF Elisha Mugisha, Regional Fire Officer; Juma Haule Regional Epidemiologist – Watch Officer; Dr. Paschal Mgaya, Emergency Coordinator – Ilala; Ms. Grace Mawalla, TRCS Regional Coordinator; Dr. Deisy Maiamba, Assistance Administrative Secretary (Health); and Magdalena Msaki, Disaster Coordinator Dar es Salaam City Council.

EOC Team

Mr. Longino Rwegoshora, Deputy Fire Officer; Sgt Christina Lyabonga; FC Eva Macha; FC Thomson Mrema.

Fire and Rescue Force

Mr. Kakwembe Elia, Regional Fire Officer – Temeke; Mr. Hamza Jumanne, Operation Commander – Fire; Mr. Abdulrahman Ngaugia, Deputy Fire Officer – Ilala; Mr. Mtarazaki Saburi, Operation Officer; Mr. Omari Memba, Operation Officer.

Tanzania Police Force

Mr. ACP Evance Mwijage, Commanding Officer of Police Marine; Mr. ACP Mohamed Salum Hamad, Marine Operations Officer; and Mr. Desdery Rugimbana, Officer-in-Charge unit 999.

Regional Medical Officers

Dr. Emanuel Kombe, Municipal Emergency Coordinator; Dr. Felister Kimolo, Municipal Emergency Coordinator; Dr. Consolata Mbatina, Municipal Emergency Coordinator; Ms. Sikudhani Yotham, Disaster Risk Management Expert.

Private Sector

Mr. Joseph Sulemani and Mr. Omar Issa, Private Ambulance Coordinators.

Municipal Authorities

Ms. Pendo Fred Mawaisaka, Municipal Disaster Coordinator of Kinondoni; Ms. Juliana Kibonda, Municipal Disaster Coordinator of Ubungo; Ms. Sweetbertha Paschal, Municipal Disaster Coordinator of Temeke; and Ms. Suzan Philemon Swai, Municipal Disaster Coordinator of Kigamboni.

Transport Agencies

Mr. Nebu Kyando, Operations Manager of the Dar es Salaam Rapid Transit (DART) Agency; and Ms. Eng Adolfina Ndyetabura of the Tanzania Railways Corporation.

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Engr. Paschal Luhwavi, Safety Engineer Officer of the Tanzania Electric Supply Company Limited (TANESCO); and Mr. Benedict Julius, Regional Manager of the Tanzania Rural and Urban Roads Authority (TARURA).

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Mr. Elias Lipiki, Meteorologist.

Non-Government Agencies

Mr. Adam Ismail, Coordinator of the SHIA Community.

These key representatives went through a series of co-development processes which proved to be instrumental to the development of the 2021 Flood Contingency Plan. In this light, we would like to acknowledge with our sincerest thanks to the contributions of these individuals and their respective institutions in the development of this 2021 Flood Contingency Plan under the leadership of the DarMAERT Coordinator, Mr. Salum Hamidu, without which this process would not have been possible. Thank you for spending time and resources to participate in the different activities conducted for the development of the 2021 Flood Contingency Plan under the Strengthening Emergency Preparedness and Response Capacity of the Dar es Salaam Multi-Agency Response Team Technical Assistance from April 2020 to June 2021.

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It is our expectation that this Flood Contingency PLan be utilized by all stakeholders for the continuing improvement of DarMAERT's emergency management services for the people of Dar es Salaam.

Hassan Abbas Rugwa
REGIONAL ADMINISTRATIVE SECRETARY
Dar es Salaam

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Acronyms and Abbreviations

ARU	Ardhi University
CCG	Communication Coordinating Group
ConOps	Concept of Operations
DarMAERT	Dar es Salaam Multi-Agency Emergency Response Team
DMD	Disaster Management Department
DDMC	District Disaster Management Committee
EM	Emergency Management
EMAP	Emergency Management Accreditation Program
EMI	Earthquakes and Megacities Initiative
EOC	Emergency Operations Center
ERF	Emergency Response Function
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
ICS	Incident Command System
IAP	Incident Action Plan
MDMC	Municipal Disaster Management Committee
NDMP	National Disaster Management Policy
NGO	Non-Government Organization
NOG	National Operational Guidelines for Disaster Management
PHC	Population and Housing Census
PO-RALG	President's Office – Regional Administration and Local Government
RAS	Regional Administrative Secretary
RDMC	Regional Disaster Management Committee
RMO	Regional Medical Officer
SAR	Search and Rescue
SitRep	Situation Report
SLR	Sea-Level Rise
SOP	Standard Operating Procedures
TARURA	Tanzania Rural and Urban Road Agency
TDMA	Tanzania Disaster Management Act
TNOG	Tanzania National Operational Guidelines for Disaster Management
TED	Training, Exercises and Drills
TEPRP	Tanzania Emergency Preparedness and Response Plan
TRCS	Tanzania Red Cross Society
TURP	Tanzania Urban Resilience Program
UNDRR	United Nations Office for Disaster Risk Reduction
WB	World Bank

Key Concepts

Capacity

Capacity is the combination of all the strengths, attributes, and resources available within an organization, community, or society to manage and reduce disaster risks and strengthen resilience. Capacity may include infrastructure, institutions, human knowledge and skills, and collective attributes such as social relationships, leadership, and management. (United Nations Office for Disaster Risk Reduction [UNDRR], 2017)

Contingency Planning

Contingency planning is a management process that analyses disaster risks and establishes arrangements in advance to enable timely, effective, and appropriate responses. It results in organized and coordinated courses of action with clearly identified institutional roles and resources, information processes, and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or hazardous events, it allows key actors to envision, anticipate and solve problems that can arise during disasters. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised. (UNDRR, 2020)

Disaster

Disaster means A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

Annotations: The effect of the disaster can be immediate and localized, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or those at the national or international levels. (UNDRR, 2017)

Disaster Management

The organization, planning and application of measures preparing for, responding to, and recovering from disasters.

Annotation: Disaster management may not completely avert or eliminate the threats; it focuses on creating and implementing preparedness and other plans to decrease the impact of disasters and “build back better”. Failure to create and apply a plan could lead to damage to life, assets, and lost revenue. (UNDRR, 2017)

Disaster Response

This refers to actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

Annotation: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. Effective, efficient and timely response relies on disaster risk-informed preparedness measures, including the development of the response capacities of individuals, communities, organizations, countries and the international community.

The institutional elements of response often include the provision of emergency services and public assistance by public and private sectors and community sectors, as well as community and volunteer participation. “Emergency services” are a critical set of specialized agencies that have specific responsibilities in serving and protecting people and property in emergency and disaster situations. They include civil protection authorities and police and fire services, among many others. The division between the response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage. (UNDRR, 2017)

Disaster Risk

This refers to the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society, or a community in a specific period, determined probabilistically as a function of hazard, exposure, vulnerability, and capacity. The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least. It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors. (UNDRR, 2017)

Disaster Risk Management

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. Disaster risk management actions can be distinguished between prospective disaster risk management, corrective disaster risk management, and compensatory disaster risk management, also called residual risk management. (UNDRR, 2017)

Disaster Risk Reduction

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development. Disaster risk reduction is the policy objective of disaster risk management, and its goals and objectives are defined in disaster risk reduction strategies and plans. (UNDRR, 2017)

Emergency

This term is sometimes used interchangeably with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society. (UNDRR, 2017)

Emergency Management

The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response, and initial recovery steps. EM differs from Disaster Management in that it not only deals with managing disasters, but all types of emergencies and crises. (UNDRR, 2009)

Hazard

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

Annotations: Hazards may be natural, anthropogenic or socionatural in origin. Natural hazards are predominantly associated with natural processes and phenomena. Anthropogenic hazards, or human-induced hazards, are induced entirely or predominantly by human activities and choices. This term does not include the occurrence or risk of armed conflicts and other situations of social instability or tension which are subject to international humanitarian law and national legislation. Several hazards are socionatural, in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change. (UNDRR, 2017)

Incident

This refers to an occurrence or event, either human-caused or by natural phenomena, that threatens human welfare, environment, or security of the country and that requires action by emergency response personnel to prevent or minimize loss of life or damage to property and/or natural resources. (TNOG, 2014)

Incident Commander (IC)
This refers to the officer that has overall responsibility for managing the incident and dictating tactics and resource management. (TNOG, 2014)

Incident Command System (ICS)
The ICS is a standardized on-scene emergency management construct specifically designed to provide for the adoption of an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents. It is used for all kinds of emergencies and is applicable to small, as well as large and complex incidents. ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations. (FEMA, 2010)

Preparedness
Preparedness refers to the knowledge and capacities developed by governments, response and recovery organizations, communities, and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent, or current disasters. Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, the stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation, and public information, and associated training and field exercises. These must be supported by formal institutional, legal, and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required. (UNDRR, 2017)

Prevention
This refers to activities and measures to avoid existing and new disaster risks. Prevention (i.e., disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where, as a result, the risk of disaster is removed. Prevention measures can also be taken during or after a hazardous event or disaster to prevent secondary hazards or their consequences. (UNDRR, 2017)

Resilience
The ability of a system, community, or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. (UNDRR, 2017)

Response
This refers to actions taken directly before, during, or immediately after a disaster to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. The effective, efficient, and timely response relies on disaster risk-informed preparedness measures, including the development of response capacities of individuals, communities, organizations, countries, and international community. The institutional elements of response often include the provision of emergency services and public assistance by public, private and community sectors, as well as community and volunteer participation. (UNDRR, 2017)

Strategy
The general plan or direction selected to accomplish incident objectives. (FEMA, 2010).[1]

[1] The term "strategy" is used in this document as an Incident Command System terminology.

1. Introduction

The Flood Contingency Plan within DarMAERT's Family of Emergency Response Plans as an addition to the Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT)'s "Family of Emergency Response Plans", this Flood Contingency Plan is intended to supplement and complement both the Emergency Response Plan 2020 Update, and Standard Operating Procedures for DarMAERT's Emergency Response Functions. With the Emergency Response Plan 2020 update establishing a *framework for DarMAERT's response operations and general guidelines*, and Standard Operating Procedures for Emergency Response Functions establishing *a multi-hazard Concept of Operations for interactions between Emergency Response Functions and the DarMAERT EOC*, this Flood Contingency Plan provides additional detail *for external-facing response operations*, *further refining specific response strategies of the DarMAERT EOC and ERFs in the event of a catastrophic flood.*

Whereas the Standard Operating Procedures for Emergency Response Functions are multi-hazard operational policies and procedures to achieve quality, safe operations, and security, the Flood Contingency Plan augments these policies and procedures when the DarMAERT EOC is activated for a flood emergency. The Flood Contingency Plan is a document that guides external response operations, and is typically updated by the Operations Section Commander and Planning Section Commander. The Flood Contingency Plan is activated by the DarMAERT EOC when DarMAERT is provided a warning by the Tanzania Meteorological Agency that would potentially reach "extensive" and "catastrophic" damage levels.

Please note that a Flood Contingency Plan is not intended to supplement what is referred to as a "Field Operations Guide." Whereas the Flood Contingency Plan provides strategies to guide the DarMAERT EOC and Emergency Response Functions during a flood emergency, a Field Operations Guide is intended to be a checklist-based operational resource for first responders who are providing an on-scene incident response. Please refer to the Plan Maintenance Section for detailed information regarding continuing to maintain this Flood Contingency Plan as a "living document," training and testing processes, and editorial processes for continuing to refine the resource inventory tables which are currently shown in template form due to available information.

<u>Geography</u>

Dar es Salaam is one of Tanzania's major regions. It is a coastal city located in the eastern part of the Tanzanian mainland at 6°51'S latitude and 39°18'E longitude. With an area of 1,350 square kilometers, it occupies 0.19 percent of the Tanzanian mainland, stretching about 100 kilometers between the Mpiji River to the North and beyond the Mzinga River in the South. The Indian Ocean borders it to the East. The Dar es Salaam Region is one of

30 administrative regions in Tanzania with its regional capital as the city of Dar es Salaam. The city consists of five districts – Ilala, Kinondoni, Temeke, Kigamboni, and Ubungo and is each governed by their own Municipal Councils. The Municipal Councils (MCs) report directly to the President's Office – Regional Administration and Local Government (PO-RALG). The Ilala Municipal Council is now known as the Dar es Salaam City Council.

According to the 2012 Population and Housing Census (PHC), the Dar es Salaam Region is home to about 4.36 million people, accounting for about 10% of the total population in Tanzania. From 2002-2012, it had an average annual population growth rate of 5.6 %. Gender distribution in the region is balanced with females outnumbering males by less than 3%. The youth comprise about a quarter (23.8%) of the total population, while the elderly (aged 60 years and above) comprise only 3.5%. About two-thirds (66.3%) of people in the region are of working age (15-59 years).

Also according to the 2012 PHC, Kinondoni is the most populated municipality with about 1.8 million people, followed by Temeke and Ilala with 1.3 million and 1.2 million population, respectively. While the 2012 PHC was conducted when the Ubungo and Kigamboni municipalities were yet to be established, the population at the said municipalities for the same timeframe (i.e. August 2012) was estimated to be about 1,189,518 and 766,569 persons, respectively[2]. Population density is estimated at 3,100 persons per square kilometer[3]. The current total population in the region is estimated at 6 million people based on historical population growth[4]. Dar es Salaam (4.6 million population in 2012) is expected to become a megacity by 2030 with a population of over 10 million[5].

Climate[6]

Dar es Salaam receives over 1,000 mm of rainfall per year and has a bimodal rainfall distribution, the two main rain seasons being the long rains and the short rains, associated with southward and northwards movements respectively of the Inter-Tropical Convergence Zone. The long rains season (Masika) occurs from mid-March to the end May, and the short rains (Vuli) from mid-October to late December. Mean rainfall is projected to increase during the long rain season over coastal areas, including Dar es Salaam, by up to 6 percent by 2100[7].

[2] Tanzania National Bureau of Statistics (web). Retrieved, January 2020 at https://nbs.go.tz/index.php/en/, https://www.citypopulation.de/php/tanzania-coastal-admin.php?adm2id=070112, http://citypopulation.info/php/tanzania-coastal-admin.php?adm2id=070301.
[3] Macrotrends (web). Retrieved, January 2020 at https://www.macrotrends.net/cities/22894/dar-es-salaam/population
[4] World Population Review (web). Retrieved, January 2020 at http://worldpopulationreview.com/world-cities/dar-es-salaam-population/.
[5] World Bank. 2015. Project Appraisal Document. Dar es Salaam Metropolitan Development Project
[6] The United Republic of Tanzania: President's Office – Regional Administration and Local Government, Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT) Emergency Response Plan (ERP), 2017.
[7] The World Bank. Urban Poverty and Climate Change in Dar es Salaam, Tanzania: A Case Study, 2011.

In relation to rainfall intensity, records for the period 1971-2009 show that the mean 24-hour maximum rainfall ranges from over 50 mm in April-May to 10mm for July-August. Both rainfall amount and intensity are variables of concern from the point of view of flooding in Dar es Salaam. The intensity and variability of precipitation is likely to increase in the coming years with the progression of climate change.

With regard to temperature, Dar es Salaam has a mean annual maximum of 30.8°C, and a mean annual minimum of 21.3°C. Temperature projections estimate a significant increase in the number of days exceeding 32°C in Dar es Salaam by 2050, which would affect health, as well as labor productivity in the city.

Topography[8]

The city is divided into three ecological zones, namely the upland zone comprising hilly areas to the West and North of the city, the middle plateau, and the lowlands, which include Msimbazi Valley, Jangwani, Mtoni, Africana, and Ununio areas. Natural vegetation mainly includes coastal palm groves, coastal shrubs, Miombo woodland, coastal swamps, and swampy mangrove trees and reeds.

1.1. Hazard Identification

Dar es Salaam is exposed to many hazards, especially as a coastal region. While the exponential growth of the region into a megacity (with more than 10 million population by 2030) Dar es Salaam remains one of the urban centers worst affected by flooding in Tanzania[9]. Severe impacts in terms of loss of life and property are associated with floods in 2008, 2009, 2011, 2014-2016, 2018 and 2019, and 2020[10].

Aside from the most common hazard of flooding, human-induced hazards in Dar es Salaam include road accidents, fire outbreaks (may mostly be attributed to electrical faults and flammable industrial products), building collapses (such as the 16-story building collapse in 2013 that claimed 34 lives and involved a major rescue operation) and health epidemics (such as cholera, malaria, dysentery, diarrhea, swine flu, avian flu, etc.). Accidents involving ammunition have also been reported in the last decade. During the ammunition depot explosion in Mbagala on April 29, 2009, about 26 lives were lost and 9,704 people were affected, also costing response and recovery expenses of about

[8] The United Republic of Tanzania: President's Office – Regional Administration and Local Government, Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT) Emergency Response Plan (ERP), 2017.
[9] The United Republic of Tanzania and The World Bank Global Facility for Disaster Risk Reduction, Final Report: Lessons Learned Exercise for Emergency Preparedness and Response in Tanzania [draft], 2019.
[10] The United Republic of Tanzania, the European Union, the United Nations Office for Disaster Risk Reduction and CIMA Research Foundation, UR Tanzania: Disaster Risk Profile (Flood and Drought), 2019.

TSH 10.8 billion. Table 1 below provides a summary of some of the major disasters experienced in the Dar es Salaam Region in the last decade.[11]

Table 1. Summary of Selected Disasters in Dar es Salaam, 2011-2019 [12]

Date/ Duration	Type of Hazard	Affected Municipality/ Municipalities	Estimated Damages
December 2019	Solid waste falls off	Temeke	• 8 houses destroyed • 3 deaths recorded
October and December 2019	Floods	Ilala and Ubungo	• More than 1,000 people affected (some lost their houses) • Damage to public and private infrastructure
February 2019	Fire	Temeke (Bora Industry)	• 4 police officers injured • 3 godowns/warehouses destroyed
January 2018	Gas explosion	Ilala (Vingunguti)	• 50 People lost their houses • 100 people were affected
March 2018	Fire	Temeke (market)	• 459 shops burned
February 2018	Fire	Temeke	• 9 shops burned
April and May 2018	Floods	Kinondoni, Temeke, Ubungo, Ilala	• 2,151 households displaced, 42 houses and 21 latrines destroyed, 342 houses in Kinondoni severely damaged • Infrastructure damage (e.g. bridges and roads in Kinondoni and Ubungo) • City Bus Rapid Transit (BRT) system disrupted by the floods • 500 people affected (some lost their houses at Ilala) • 15 deaths recorded in Kinondoni, 1 death recorded in Temeke
February 2016	Floods	Temeke	• 4 deaths recorded
October 2014	Fuel tank explosion	Temeke	• guest house and 7 shops burned • 7 deaths recorded
April 2014	Floods	Kinondoni and Temeke	• 20,000 people were affected • 13 houses were destroyed in Msimbazi and 283 cholera victims in Kinondoni • 19 deaths recorded in Kinondoni, 7 deaths recorded in Temeke
April 2012	Floods	Temeke	• 360 houses were partially damaged • 34 houses destroyed • 3 deaths recorded
February 2011	Ammunition explosion	Ilala (Gongo la Mboto)	• 113 houses partially damaged • 46 houses destroyed • 30 deaths recorded
December 2011	Floods	Kinondoni and Temeke	• Displaced 10,000 people in Kinondoni • Displaced 3,290 people in Temeke

[11] Source: Disaster Loss and Damage data (2017-2020), Disaster Management Department.
[12] Disaster Loss and Damage Data (2011-2019), Disaster Management Department.

			• 41 deaths recorded

1.2. Planning for Flooding Hazards

Dar es Salaam is a coastal region that is challenged by hazards such as pests, disease outbreaks, and floods.[13] In terms of magnitude and frequency, flooding poses the most frequently occurring hazard in Dar es Salaam with annual major flooding incidences especially during the "masika" or long rains season (usually from March to May, with average cumulative rainfall at about 610mm[14]). The naturally low-lying topography of many areas in the region is susceptible to flooding, particularly flash flooding. Susceptibility is related to spatial aspects of the hazard, particularly the tendency of an area to undergo the effects of a certain hazardous process (in this case, flooding)[15]. This susceptibility is aggravated by structural interferences such as inadequately maintained stormwater drains and solid waste especially along with some settlements in the Msimbazi River[16], causing flooding even during minor storms such as those during the "vuli" or short rain season (commonly from October to December, with average cumulative rainfall of about 350mm[17]).

Dar es Salaam's susceptibility to flooding incidents accounts for the most number of population affected and displaced in the region almost annually, highlighting the vulnerability[18] of the region's populace to flooding disasters. For instance, in the April 2018 flooding alone (about 81.8mm of rainfall for two days plus 99.6mm of rainfall on the third day), reports indicate that about 12,000 out of the 15,900 people affected in the country are from Dar es Salaam.[19] Inundation of a similar level and the impact was also recorded after about 144mm of rainfall in May 2019.[20] Affected households by annual flooding incidences average to thousands, significantly exceeding the impact of other hazards in the region (as referenced in Table 1). According to the World Bank, at least 39% of the population—or 2 million people— have been impacted either directly or indirectly by floods. The April 2018 flood-affected between 900,000 and 1.7 million people.[21]Other top hazards impacting Dar es Salaam include road accidents, building collapse, structural fires, infectious disease outbreaks, as well as tsunamis. However, flooding is the most frequently occurring hazard the region experiences.

[13] The United Republic of Tanzania: Prime Minister's Office – Disaster Management Department, Tanzania Emergency Preparedness and Response Plan, 2012.
[14] University of Capetown, et al., Urban Africa Risk Knowledge: Dar es Salaam Climate Profile: Full Technical Version, 2017.
[15] Encyclopedia of Natural Hazards, 2013.
[16] Pan-African START Secretariat, et.al., Urban Poverty & Climate Change in Dar es Salaam, Tanzania: A Case Study, 2011.
[17] University of Capetown, et al., Urban Africa Risk Knowledge: Dar es Salaam Climate Profile: Full Technical Version, 2017.
[18] Vulnerability is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard (UNDRR, 2009).
[19] Erman, A., et al., 'Wading out the Storm: The Role of Poverty in Exposure, Vulnerability and Resilience to Floods in Dar es Salaam', Policy Research Working Paper 8976, The World Bank Group: Global Facility of Disaster Reduction and Recovery, August 2019.
[20] Ibid.
[21] Wading out of the Storm: Flood Risk and Vulnerability in Dar es Salaam. The World Bank. October 2019.

Maps from the World Bank Tanzania Office developed under the *Ramani Huria* Community Mapping Project also provide critical information, especially on flood susceptibility. Flooding is not limited to unplanned settlements, as many planned settlements, especially in the coastal areas, also commonly experience flooding particularly during high tide, which is even further exacerbated during strong lunar high tide events. About 8 percent of the city (with about 143,000 people and associated economic assets of about an estimated US$168 million) are also vulnerable to Sea Level Rise (SLR). This scenario adds additional cause for alarm on top of the current estimates of 60,000 people and US$ 219 million worth of assets exposed in a 1 in 100-year flood by 2030, even in the absence of climate change-related SLR.[22] Severe coastal and riverine flooding, as well as wind hazard, could potentially result from the landfall of a strong tropical cyclone. While a strong cyclone has not been experienced in Dar es Salaam since the early 1950s, it is possible that strong cyclones similar to Cyclones Idai and Kenneth which impacted Mozambique and southern Tanzania in 2019 could potentially occur in the future. Though large uncertainties surround projected changes in tropical cyclone landfall, future precipitation projections indicate extreme rainfall conditions may become more frequent[23]. Figure 1 shows a map reflecting the 21 flood-prone wards in Dar es Salaam from the *Ramani Huria* Project. It is noted that inundation is prevalent in many residential areas, highlighting the direct impact on many households. The map further shows important structures such as schools and hospitals as well as residential and commercial areas that will be affected by flooding. These mapping products can support DarMAERT members to plan for drainage system upgrades or potential or flood mitigation projects. In addition, they support situational awareness of the number of residents to be affected when flooding occurs and help identify areas requiring early warning when a flood is imminent.

With the naturally low-lying topography of many areas in Dar es Salaam, continuing urbanization, and climate change, flooding problems are expected to increase in the coming years. Flooding also tends to aggravate the other hazards, such as, but not limited to, disease outbreaks. For instance, the city's poor environmental conditions contribute to water-borne diseases such as diarrhea, cholera, hepatitis A, and typhoid fever, as well as vector-borne diseases such as malaria, dengue fever, and schistosomiasis, which are commonly exacerbated by flooding incidence.[24] Flooding can heighten conditions for disease, as it worsens already poor hygiene and living conditions, and lack of access to clean water, especially for unplanned areas, highlighting the need for immediate mitigating interventions, especially in the context of increasing climate variability.

[22] DfID. N.A. Business Cae. Building Urban Resilience to Climate Change in Tanzania.
[23] Future Southern African Summer Rainfall Variability related to a Southwest Indian Ocean Dipole in HadCM3, Geophysical Research Letters, Kay and Washington, 2008.
[24] Pan-African START Secretariat, et.al., Urban Poverty & Climate Change in Dar es Salaam, Tanzania: A Case Study, 2011.

The Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT), hence, finds it crucial to have a contingency plan for flooding that shall help ensure preparedness for effective response in the five districts and the entire region.

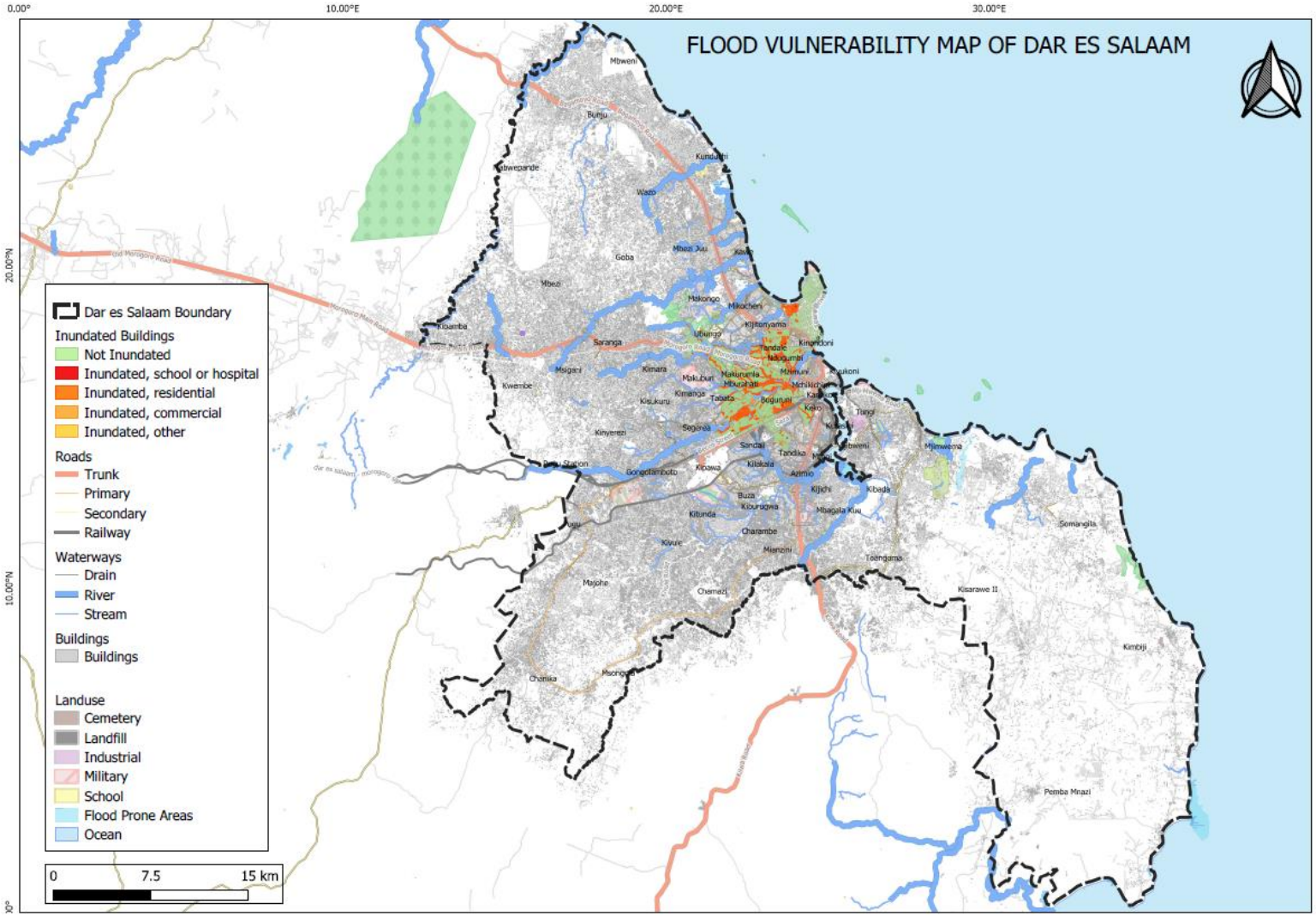


Figure 1. Map of 21 Flood-prone Wards in Dar es Salaam under the Ramani Huria Project, 2016

1.3. Scenarios

The following describes "severity" - the extent or magnitude upon which a hazard is ranked per international standards criteria, in this case the Threat and Hazard Risk Identification (THIRA) methodology used by the Federal Emergency Management Agency in the United States . In Table 2, below, flood-specific severity is described in terms of minor, serious, extensive, and catastrophic categories.

Table 2: Flood Severity Categories per International Standards Criteria [25]

Severity	**Minor**	**Serious**	**Extensive**	**Catastrophic**
Description of the Severity of the Flood Scenario	Limited and scattered property damage, limited damage to public infrastructure and essential services not interrupted, limited injuries or fatalities.	Scattered major property damage, some minor infrastructure damage, essential services are briefly interrupted, some injuries and/or fatalities.	Widespread major property damage, major public infrastructure damage (up to several days for repairs), essential services are interrupted from several hours to several days, many injuries and/or fatalities.	Property and public infrastructure were destroyed, essential services stopped, numerous injuries and fatalities.

For this flood contingency plan, an extensive to catastrophic flood scenario will be utilized to support "worst-case scenario planning" that would support detailed planning by DarMAERT to address destructive flood events. By focusing on the "extensive" and "catastrophic" categories, the lessons learned will also support response planning for more frequently occurring floods in the minor and serious categories.

1.3.1. Key features of the "worst-case scenario"

To further refine the context of response operations tied to a worst-case scenario---encompassing the "extensive" and "catastrophic" categories above—the following general parameters of a hypothetical flood event are set forth below. These parameters help to guide the detailed operational planning contained within this Flood Contingency Plan.

- An active rainy season is in progress
- Heavy rainfall totaling ~100-200 mm of rain are scattered in 3 days throughout different areas of Dar es Salaam.

[25] 2019 National Threat and Hazard Identification and Risk Assessment (THIRA). Federal Emergency Management Agency. 2019.

- The flooding is both riverine and coastal, including coastal storm surge, creating substantial flooding throughout city limits.
- This scenario is based on historical events experienced in Dar es Salaam. The most recent events are the May 2019 and April 2018 flooding events in Dar es Salaam. Other scenarios that can be used as a reference are the December 2011 and April 2014 flooding events referred to in Table 1.

2. Goal and Objectives of the Contingency Plan

2.1. Goal

The goal of the contingency plan is to provide effective, efficient, timely, and well-coordinated response mechanisms in the event of "extensive" and "catastrophic" flooding in Dar es Salaam. Such mechanisms shall help to protect lives, properties, and the environment, and restore the immediate needs of the affected communities.

2.2. Objectives

The objectives of the contingency plan are as follows:

i. To establish coordination response mechanisms among the stakeholders of Dar es Salaam in the event of flooding.
ii. To ensure the protection of lives, properties, and the environment in the event of flooding in Dar es Salaam;
iii. To determine the response needs and the resources to address the needs in the event of flooding;

3. Coordination, Command, and Control

3.1. Coordination between Emergency Response Functions

Coordination among the different agencies and organizations that comprise and/or support DarMAERT is crucial to ensure that the expertise and skills needed during flooding emergencies are provided. Table 3 provides a list of the required Emergency Response Functions (ERFs), with the corresponding agencies that must be activated in response to flooding, while Table 4 enumerates the responsibilities of the Emergency Response Agencies within each ERF to accomplish upon activation of the Flood Contingency Plan for DarMAERT.

These Emergency Response Agencies provide support to the Emergency Operations Center (EOC) by performing tactical support at the EOC (silver command) while, at the same time, also providing operational functions on-scene (bronze command), as prescribed in the National Operational Guidelines for Disaster Management 2014 and the DarMAERT Emergency Response Plan 2020 Update. Please note that the flood-specific actions cited in the Flood Contingency Plan are more refined and targeted to flood response emergency operations than the multi-hazard activities cited in Standard Operating Procedures for Emergency Response Functions.

Table 3. Description of Key ERFs in Dar es Salaam Region

EMERGENCY RESPONSE FUNCTION	DESCRIPTION
1. Direction and Control	Releasing of order, directing and controlling all emergency response activities in Dar es Salaam Region, including making sure that the response is governed by the applicable legal framework, and efforts and resources are well-coordinated and implemented; and ensuring that each Emergency Response Function and Command and General Staff position is appropriately staffed at the DarMAERT EOC.
2. Communication and Warning	Ensuring rapid and reliable communication of official information for effective disaster response operations. Official information to be issued relates to the causes, effects, potential hazards and action to be taken to prevent death, injury, or property damage.
3. Evacuation	Releasing of order for evacuation, controlling evacuation operation from the EOC, moving people from the emergency area to a safer place through identified routes, and provision of return instructions.
4. Firefighting	Managing firefighting operations, including preventing, detecting, and controlling/extinguishing fire at the disaster scene. Involves close coordination of firefighting agencies and Municipal Disaster Management Coordinators.
5. Law Enforcement	Securing the incident area, maintaining public safety and order, crime prevention, ensuring access to traffic and crowd control, and closely coordinating these efforts with the DarMAERT EOC. Involves close coordination of law enforcement agencies and Municipal Disaster Management Coordinators.

EMERGENCY RESPONSE FUNCTION	DESCRIPTION
6. Health and Medical Services	Providing triage, treatment, stabilization, and caring for those injured at the scene and transferring them to health facilities, as well as appropriate transport of medical staff, resources, and equipment.
7. Search and Rescue	Searching and rescuing of people trapped (by fire, wreckage, or debris), lost, or at risk.
8. Shelter and Mass Care	Constructing temporary shelter and facilities in case of an evacuation, and assess shelter capacity including their use and management. Likewise, it also entails family reunification and provision of health and medical services, emergency relief materials, food, and psychosocial support.
9. Emergency Public Information	Timely releasing and dissemination of official information to the public with regards to the disaster incident, including handling of its information inquiries.
10. Damage Assessment	Determining the magnitude of the disaster, potential associated risks, and preparation of situation reports. Ensures safety for DarMAERT members during Damage Assessment deployments, and suggests Disaster Risk Reduction projects based on Damage Assessment findings.
11. Public Works and Engineering	Organization of resources to repair and restore essential public facilities and services (roads/streets, solid waste management, sanitary sewer, and wastewater treatment), removal of debris, an inspection of damaged structures, and provision of engineering solutions to manage the disaster situation. Involves close coordination of public works and engineering agencies and Municipal Disaster Management Coordinators.
12. Utilities	Restoring gas, clean water, and wastewater services and their infrastructure in the affected areas. It also involves employing alternative measures to provide these services in times of an emergency. Involves close coordination of utility agencies and Municipal Disaster Management Coordinators.
13. Resources Management and Supply	Managing resources (financial, material, and human), inventory, and prompt allocation of them as needed. It implies the facilitation of logistics for relief supplies, including their procurement, transport, storage, distribution, and inventory.
14. Transportation	Transporting people and resources to, from, and within the affected area, as well as the internal mobility of the city. It also entails enabling the ground, marine, and aerial transport that is required.
15. Dead Bodies Management	Managing of the dead, including their identification, investigation on the reasons for the death, and burial of bodies that could not be identified or pose a health risk. This also includes the installation and management of mortuaries. Dead bodies management is elevated to a priority incident objective during catastrophic disasters.

Table 4. DarMAERT ERFs per primary and secondary stakeholders (ERFs 1-15)[26]

ERF 1 - Direction and Control	ERF 2 - Communication and Warning	ERF 3 - Evacuation	ERF 4 - Firefighting	ERF 5 – Law Enforcement
Primary: Dar es Salaam Regional Commissioner's Office (RCO) – Regional Disaster Management Committee (REDMAC)	**Primary:** Dar es Salaam RCO – REDMAC **Deputy Primary:** • Tanzania Meteorological Authority (TMA) • Municipal Councils **Secondary:** • Telephone Companies Media	**Primary:** Tanzania Police Force (TPF) **Secondary:** • Tanzania National Roads Agency (TANROADS) • Tanzania Urban and Rural Roads Agency (TARURA) • Tanzania People's Defense Force (TPDF) • Tanzania Red Cross Society (TRCS) • Hospitals • Ambulance Services • Municipal Councils • Tanzania Scouts Association (TSA) • Non-Governmental Organizations (NGOs) and Voluntary Organizations • Faith-Based Organizations (FBOs) and Community-Based Organizations (CBOs) • Public and Private Transport Agencies • Private Sector	**Primary:** Tanzania Fire and Rescue Force (TFRF) **Secondary:** • Tanzania Electric Supply Company (TANESCO) • Tanzania Scouts Association • NGOs • FBOs and CBOs • Private Sector	**Primary:** Tanzania Police Force (TPF) **Secondary:** Tanzania People's Defense Force (TPDF)

[26] The assignment of deputy primary stakeholder/s (deputy lead agencies) in some of the ERFs is recommended to address the previous dual assignments of lead agencies, similar to the recommended future directions at the National level based on international standards and practice. The primary stakeholder (lead agency) provides command oversight for the ERF based on its core expertise while the deputy primary stakeholder/s (deputy lead agency/ies facilitates the ERF's mobilization and access to resources (i.e. liaising and networking for the ERF). The deputy likewise steps in if needed when the primary is indisposed to facilitate continuity of command for the ERF.

ERF 6 – Health and Medical Services	ERF 7 – Search and Rescue (SAR)	ERF 8 - Shelter and Mass Care	ERF 9 – Emergency Public Information	ERF 10 – Damage Assessment
Primary: Regional Medical Office **Deputy Primary:** • Hospitals • Ambulance Services **Secondary:** • Tanzania Fire and Rescue Force (TFRF) • Tanzania Red Cross Society (TRCS) • Municipal Councils	**Primary:** TFRF **Secondary:** • Tanzania Police Force (TPF) • Tanzania National Roads Agency (TANROADS) • Tanzania Urban and Rural Roads Agency (TARURA) • TRCS • Tanzania Scouts Association • Private Sector	**Primary:** RCO – Regional Social Welfare Department **Deputy Primary:** TRCS **Secondary:** • TPF • TFRF • TPDF • TRCS • TANESCO • Dar es Salaam Water and Sewerage Authority (DAWASA) • Municipal Councils • Tanzania Scouts Association • NGOs • FBOs and CBOs	**Primary:** Dar es Salaam RCO – REDMAC **Secondary:** • TPF • Telephone Companies • Media	**Primary:** Dar es Salaam RCO– REDMAC **Deputy Primary:** TANROADS TARURA Municipal Councils **Secondary:** • TPF • TFRF • TANROADS • TARURA • TPDF • TRCS • TANESCO • DAWASA • Municipal Councils • NGOs • FBOs and CBOs • Private Sector

ERF 11 – Public Works and Engineering	ERF 12 - Utilities	ERF 13 – Resources Management and Supply	ERF 14 - Transportation	ERF 15 - Dead Bodies Management
Primary: RCO – Regional Infrastructure Development Department **Deputy Primary:** • TANROADS • TARURA **Secondary:** • TPF • TFRF • TPDF • TANESCO • DAWASA • NGOs • FBOs and CBOs • Private Sector	**Primary:** RCO – Regional Infrastructure Development Department **Secondary:** • TANESCO • DAWASA • NGOs • FBOs and CBOs • Private Sector	**Primary:** Dar es Salaam RCO – REDMAC **Secondary:** • TRCS • Municipal Councils • NGOs • FBOs and CBOs	**Primary:** RCO – Regional Department of Transporation **Deputy Primary:** Ambulance Services **Secondary:** • Tanzania Police Force • TRCS • Hospitals • Ambulance Services • Tanzania Scouts Association • NGOs • FBOs and CBOs • Public and Private Transport Agencies	**Primary:** Regional Medical Office **Deputy Primary:** TPF **Secondary:** • TRCS • Hospitals • Municipal Councils • FBOs and CBOs

The list of responsibilities of each ERF are as follows:

ERF # 1 – Direction and Control

Responsibilities:

- ☐ Coordinate the response of all the departments within Dar es Salaam and the use of all resources to provide emergency response.
- ☐ Identify actions to be taken in the pre-incident prevention phase.
- ☐ Coordinate with agencies, organizations, and outside organizations when capabilities/capacities are exceeded.
- ☐ Identify post-incident response phase activities.
- ☐ Implement other functions that support and facilitate planning and coordination such as:
    - Alert and notification,
    - Deployment and staffing of emergency response teams,
    - Incident action planning,
    - Coordination of operations with local government for logistics and material,
    - Direction and control,
    - Information management,
    - Facilitation of requests for assistance,
    - Resource acquisition and management (to include allocation and tracking),
    - Worker safety and health,
    - Facilities management,
    - Financial management,
    - Other support as required
- ☐ Develop, maintain, and update plans and procedures for use during an emergency;
- ☐ Educate and train department and support agency personnel to stay up to date with education and training that is required for a safe and efficient response to an incident;
- ☐ Provide a multi-departmental command system.
- ☐ Manage operations at Dar es Salaam;

Notes:

- The Incident Command System (ICS) can be used in any size or type of disaster to control response personnel, facilities, and equipment.
- Departments and agencies participate in the incident action planning process which is coordinated by ERF #1

ERF # 2 – Communications and Warning

Responsibilities:

- ☐ To use all available communication resources to respond to an incident.
- ☐ Alert and warn the various Emergency Response Agencies, relevant officials, and the community of a possible or actual emergency.
- ☐ Continue to communicate with the community through a variety of media to inform of protective actions.
- ☐ Ensure that the DARMAERT EOC can notify the community of a disaster or emergency situation.
- ☐ Support DarMAERT with the restoration and reconstruction of telecommunications equipment, computers, and other technical resources.

Note:

- Communication includes transmission, emission, or reception of signs, signals writing, images, and sounds or intelligence of any natures by wire, radio, optical, or other electromagnetic systems.

ERF # 3 – Evacuation

Responsibilities:

- ☐ Concerned with the release of orders for evacuation.
- ☐ Control evacuation operations from the EOC.
- ☐ Move people from the emergency area to a safer place through identified routes.
- ☐ Provision of return instructions.

ERF # 4 – Firefighting

Responsibilities:

- ☐ Direct and control operations regarding fire prevention, fire detection, fire suppression, rescue, and hazardous materials incidents.
- ☐ Assist with warning and alerting, communications, evacuation, and other operations as required during an emergency.
- ☐ Provide personnel, equipment, and supplies to support the agencies involved in the firefighting operations.

Note:

- The TFRF is to assume primary operational control of all hazardous materials

incidents.

- Other support departments may provide support to the TFRF, depending on their capabilities.
- The initial response will be handled by the TFRF.
- Other Departments may be called upon depending on the nature of the incident
- DarMAERT should determine which departments have the capability to support a hazard material response, which Departments require hazardous materials response training, and seek specialized training.

ERF # 5 – Law Enforcement

Responsibilities:

☐ Identify public safety and security capabilities/capacities.
☐ Provide public safety and security for the region during disasters and emergencies.
☐ Determine factors, laws, and regulations when a disaster may require outside security resources to respond to the event, such as the National Government, due to circumstances of the event, for example, a terrorist event
☐ Provide traffic control, crime control, jail control, and evacuation and movement to safe areas.
☐ Respond to a city emergency using existing procedures of the TPF
☐ Maintain law and order.
☐ Coordinate public warning.
☐ Provide security of city facilities.
☐ Provide security of unsafe areas or potential crime scenes.
☐ Provide security if the city opens a shelter.

Notes:

- Provide Traffic Control. This group works closely with the ERF 1 group to affect the orderly flow of traffic into, out of, and around areas affected by a disaster.
- Security/Crime Control. This group addresses the provision of security in disaster areas, as well as the actual policing functions normally associated with law enforcement activities, including riot control, explosive ordinance removal, counterterrorism, etc.
- Institutions/Jails. This group is responsible for coordinating prisoner recapture, the utilization of prisons and facilities following disasters, and the moving of prisoners from damaged facilities to undamaged ones.
- Evacuation/Movement. This group is responsible for coordinating the

region's assistance in carrying out evacuations.

ERF # 6 – Health and Medical Services

Responsibilities:

- □ Provide health and medical services to the residents of Dar es Salaam during and after an emergency situation.
- □ Guide a response using Dar es Salaam Government resources and coordinate a response with the Ministry of Health, National Government agencies, TRCS, and United Nations organizations (e.g. World Health Organization) when the incident exceeds the region's capabilities.

Note:

- When an incident exceeds the region's capabilities, outside assistance should be requested through DarMAERT EOC to National EOCC.

ERF # 7 – Search and Rescue

Responsibilities:

- □ Provide for coordination and effective use of search and rescue activities to assist people in potential or actual distress.

Notes:

- Communities are susceptible to many different natural and technical hazards that may result in the damage or collapse of structures
- Within the city - search and rescue must be prepared to respond to emergencies and provide specialized assistance.
- Operational activities can include locating, extricating, and providing on-site medical treatment to victims trapped in collapsed structures, flooded houses, and trapped in vehicles. Additionally, people may be lost, missing, disoriented, traumatized, or injured, in which case the Mechanical Section must be prepared to respond to these incidents and implement appropriate tactics to assist those, in distress or imminent danger.

ERF # 8 – Shelter and Mass Care

Responsibilities:

- □ Addresses the non-medical mass care, housing, and human services needs of individuals and/or families impacted by natural and/or technological incidents.

- ☐ The services and programs may include the following:
  1. Sheltering
  2. Food Service
  3. Counseling
  4. Provision of Family Assistance Centers
  5. Family Reunification Services

ERF # 9 – Emergency Public Information

Responsibilities:

- ☐ Inform the community of a threatened or actual emergency.
- ☐ Coordinate with local media on public information procedures, the content of information, and information dissemination strategies.
- ☐ Provide trained public information staff in support roles to assist response and recovery efforts.
- ☐ Coordinate with different Emergency Response Agencies for information to be relayed to the media and public considering urgency and sensitivity of the information to support response.

ERF # 10 – Damage Assessment

Responsibilities:

- ☐ Determine the magnitude of the disaster, potential associated risks.
- ☐ Participate at the EOC in the preparation of situation reports.
- ☐ Conduct a rapid damage assessment immediately after the occurrence of a disaster and will continue the assessment up to post-disaster time.
- ☐ Identify Disaster Risk Reduction opportunities
- ☐ Ensure staff are well-rested and equipped before deployment to the field as coordinated with the Safety Officer

ERF # 11 – Public Works and Engineering

Responsibilities:

- ☐ Assess the overall damage to the region after a disaster.
- ☐ Perform all public works functions such as maintenance, inspections, buildings, and grounds repairs, debris removal, and facilities management
- ☐ Assist with the recovery.
- ☐ Provide maintenance of the buildings and grounds and engineering-related support.
- ☐ Clear roadways.

ERF # 12 – Utilities

Responsibilities:

- ☐ Help to prioritize facilities and infrastructure so that power may be restored or other energy supplies may be provided and enable life to be restored to full capacity as soon as possible.
- ☐ Collect, evaluate, and share information on energy system damage.
- ☐ Estimate the impact of energy system outages in the region.
- ☐ Provide information concerning the energy restoration process such as:
  - Projected schedules,
  - Percent completion of the restoration,
  - Determine a schedule for reopening facilities.

Note:

- The incident may impact a city or ward only or it may be part of a larger incident that impacts the entire region.

ERF # 13 – Resources Management and Supply

Responsibilities:

- ☐ Works with all other Emergency Response Agencies to determine what resources are available.
- ☐ Identify potential sites for receiving, storing, and distributing resources to receive outside assistance and resources.

Notes:

- Resource support may continue until the disposition of excess and surplus property is completed.
- During an incident, if demand for resources exceeds the region's capabilities and inventories, then outside requests will be made.
- Logistics. This group coordinates the actual movement of resources into areas where a need (or needs) exists. This includes the warehousing and tracking of resources, the packaging and loading and subsequent transportation of resources to affected areas, and the disposal of used and/or unused resources following a disaster.
- Resource Management. This group is responsible for the acquisition of all types of resources that are identified as "needed" following a disaster. This group will make arrangements to purchase needed resources if it is determined the region does not have the resources to supply a requirement in the field. The payment of debts and other encumbrances generated as a result of the emergency is handled by this group as well.
- Staging Areas. To prevent a rapid and overwhelming influx of resources into affected areas, Staging Areas are utilized as temporary marshaling sites for collecting and gradually directing emergency resources into those areas. This group coordinates the activation and utilization of region-operated staging

areas and marshaling points during emergency situations.

ERF # 14 – Transportation

Responsibilities:

- ☐ Coordinate the Dar es Salaam transportation resources to respond to an emergency.
- ☐ Identify the need for resources.
- ☐ Support mass evacuation.
- ☐ Maintain ingress/egress.
- ☐ Maintain traffic control.
- ☐ Keep the DarMAERT EOC apprised of any potential/current disruptions to public transportation.

Note:

- Administrative Department should coordinate with other cities within Dar es Salaam and other regions to ensure that potential resources are available in time of an emergency. Develop Memorandums of Understandings and mutual aid agreements if possible.

ERF # 15 – Dead Bodies Management

Responsibilities:

- ☐ Managing of the dead, including their identification, investigation on the reasons for death, and burial of bodies that could not be identified or pose a health risk, including the installation and management of mortuaries during disaster times

3.1.1. Flooding Emergency Response Timeframes[27]

Based on the Emergency Response Plan (ERP) 2020, emergency levels are organized into a three-tier system to determine the level of EOC activation as follows:

Level 1: An emergency incident can be handled routinely by one or more departments and government agencies within the Dar es Salaam Region, requiring the only district/local resources. At this level, normal government operations are not affected, hence, not requiring activation of the EOC.

Level 2: An emergency requires a major response and the significant commitment of resources from the Regional Government and several departments and agencies. It has the potential to require resources in excess of those available from the responding departments to bring the situation under control, hence, partial activation of the DarMAERT EOC.

Level 3: An emergency requires an extensive coordinated response and commitment of resources from all departments and government agencies and could necessitate requesting external assistance from the Prime Minister's Office, bilateral donors, or international humanitarian organizations/development partners, including the UN Cluster System, hence, full activation of the DarMAERT EOC.

The Activation phase is observed upon reaching Emergency Level 2 or 3 (i.e. partial or full activation of the EOC, respectively), while the Alert and Standby phases are observed in all levels, even in Emergency Level 1. The DarMAERT Coordinator/EOC Manager (as Incident Commander of the EOC) determines whether it is necessary to place the EOC into any one of the following three phases as needed:

Alert Phase involves notifying staff that an incident has taken place, but no immediate action is necessary at present.

Standby Phase encourages officers to consider the implications of an event that may prompt the engagement of resources, thus, the preparation of resources and staff. During this phase, the DarMAERT Coordinator/EOC Manager may call an emergency management team meeting to analyze the preparation and likely response of the Region.

Activation Phase involves the deployment of DarMAERT members to the EOC and coordination of the response operations under the direction of the Tactical Commander.

[27] This section is framed within the context of emergency response for a specific flooding scenario, in consideration of the historical frequency, potential future impacts due to climate change, and level of exposure and vulnerability of the region to flooding hazards to provide a common operating picture among users of this plan.

Similarly, DarMAERT's planned response to flooding involves many governments and non-government agencies and organizations. These entities collaborate to monitor flooding threats, provide support to local operations, and assist in recovery. In this regard, for a flooding emergency scenario, DarMAERT Emergency Response Agencies are mobilized along with four response timeframes[28]. These are:

a. Alert (A): notification of a potential hazard
b. Standby (B): personnel prepare for activation
c. Activation (C): emergency response personnel begin the movement to support response operations
d. On-site/operational (D): emergency response personnel perform response functions on-scene

It is noted, however, that while mobilization of Emergency Response Agencies generally aligns to the activation phases implemented by the EOC, the level of involvement of Emergency Response Agencies often differs based on the expertise needed in the emergency incident, hence the differentiated response timeframes based on the involvement of each Emergency Response Agency.

Table 5. Emergency Response Timeframes for ERFs in a Flooding Scenario

Emergency Response Function	H- 120	H-96 to 72	H-72 to 48	H-48 to 0	H+0 TBD	to R+0 TBD	to
Direction and Control	D	D	D	D	D	D	
Communications and Warning	D	D	D	D	D	D	
Emergency Public Information	C	D	D	D	D	D	
Resources Management and Supply	C	D	D	D	D	D	
Health and Medical Services	C	D	D	D	D	D	
Transportation	B	C	D	D	D	D	
Evacuation	B	C	D	D	D	D	
Shelter and Mass Care	B	C	D	D	D	D	
Firefighting	A	B	C	D	D	D	
Search and Rescue	A	B	B	C	D	D	
Law Enforcement	A	B	B	C	D	D	
Utilities	A	A	B	C	D	D	
Public Works and Engineering	A	A	B	C	D	D	
Damage Assessment	A	A	B	C	D	D	
Dead Bodies Management	A	A	B	C	D	D	

[28] It is noted that timeframes A-C are of tactical nature (as hosted by the EOC), while timeframe D refers to operational courses of action (performed at the incident area).

3.1.1.1. *Additional Emergency Response Functions' Procedures Specific to Flood*

This section describes additional procedures for certain ERFs that apply specifically to respond to a flooding emergency. This section, hence, supplements the information provided in the DarMAERT ERP 2020, as well as the Standard Operating Procedures for Emergency Response Functions.

The Emergency Response Functions which have significant nuances for flood related context over and above the multi-hazard Standard Operating Procedures for Emergency Response Functions are:

- Emergency Response Function 2 – Communication and Warning
- Emergency Response Function 7 – Search and Rescue
- Emergency Response Function 8 – Shelter and Mass Care

These nuances are described below. Please refer to the Standard Operating Procedures for Emergency Response Functions for operational emergency response protocols on the remaining ERFs, as the multi-hazard processes are highly applicable and need not be duplicated in this Flood Contingency Plan.

- **Communication and Warning**

Lead Agency: Dar es Salaam RCO – Regional Disaster Management Committee, assisted by the DarMAERT EOC

The Communication and Warning ERF is managed at the DarMAERT EOC through a Communication Coordinating Group (CCG) that coordinates with the RCO. In addition to the protocols and guidelines listed in the ERP 2020, the following subsection provides information specific to ERF2 within the context of floods. VHF/UHF radio communication will be the primary mechanism for transmitting and receiving information among the EOC, ERFs, and Municipal Disaster Management Coordinators. Training to use functioning VHF and UHF should, hence, be conducted. VHF/UHF radio calls will also be a mechanism to inform DarMAERT members of a full-scale EOC activation during a flood emergency.

Tanzania Meteorological Authority – Flood Information Products

The Tanzania Meteorological Authority is the official government agency designated to provide flood information products, warnings, and forecasts to both DarMAERT as well as the public. TMA provides weather forecast products and updates to DarMAERT

members via both e-mail as well as DarMAERT's WhatsApp social media channel. TMA Meteorologists also provide weather briefings to DarMAERT members at the DarMAERT EOC during flood emergency activations.

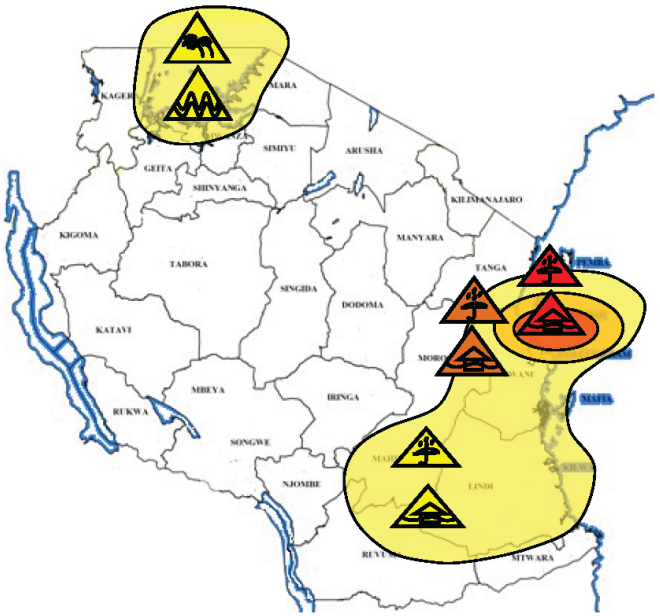
Per TMA officials, official information products use a color-coded alert system. "Yellow" is the code for an Advisory (low impact) and there are two levels of warning—"Orange Warning" (moderate impact) and "Red Warning" (high impact). The color-coded levels are designed to provide end-users with situational awareness of potential risk levels. The color-coded scale represents "Impact Based Forecasting" and is correlated to impact, rather than the total precipitation amount—although internally 50 millimeters of rainfall is flagged as a significant amount for TMA forecasters with internal guidance provided.

Example TMA flood warning products are depicted below in Figure 2 and Figure 3.

JAMUHURI YA MUUNGANO WA TANZANIA
WIZARA YA UJENZI, UCHUKUZI NA MAWASILIANO
MAMLAKA YA HALI YA HEWA TANZANIA (TMA)

Utabiri wa Siku Tano wa Hali Mbaya ya Hewa

Umetolewa Leo Tarehe 28-03-2018 Saa 09:30 Mchana



Jumatano 28-03-2018

TAHADHARI KUBWA ya **Mvua Kubwa** imetolewa kwa maeneo ya mkoa wa Dar es Salaam na baadhi ya maeneo ya mkoa wa Pwani, hususani yale yaliyo karibi na Dar es Salaam. Tafadhali CHUKUA HATUA MARA MOJA
UWEZEKANO WA KUTOKEA: **MKUBWA**
KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **KIKUBWA** (Mafuriko kutokea katika maeneo mengi na kuathiri jamii nzima, Kuvurugika kwa usafiri na barabara kubwa kutopitika, Hatari kwa maisha kutokana na maji kujaa au yanayopita kwa kasi, Kuhamishwa kwa watu kutoka maeneo yaliyoathirika, n.k.)

TAHADHARI ya **Mvua Kubwa** imetolewa kwa baadhi ya maeneo ya mkoa wa Pwani nay ale ya Kisiwa cha Unguja. Tafadhali CHUKUA TAHADHARI
UWEZEKANO WA KUTOKEA: **WA WASTANI**
KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **KIKUBWA** (Mafuriko kutokea katika maeneo mengi na kuathiri jamii nzima, Kuvurugika kwa usafiri na barabara kubwa kutopitika, Hatari kwa maisha kutokana na maji kujaa au yanayopita kwa kasi, Kuhamishwa kwa watu kutoka maeneo yaliyoathirika, n.k.)

ANGALIZO la **Mvua Kubwa** limetolewa kwa baadhi ya maeneo ya mikoa ya Pwani, Morogoro, Lindi, Mtwara na Ruvuma. Tafadhali ZINGATIA NA JIANDAE
UWEZEKANO WA KUTOKEA: **WA WASTANI**
KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (Mafuriko kuathiri sehemu ya makazi ya watu, Ucheleweshwaji wa usafiri na baadhi ya barabara kufungwa, Hatari kwa maisha kutokana na maji kujaa au yanayopita kwa kasi, n.k.)

ANGALIZO la **Upepo Mkali na Mawimbi Makubwa** limetolewa kwa baadhi ya maeneo ya mikoa ya Kagera, Geita, Mwanza na Mara hususani yale yanayopakana na Ziwa Viktoria. Tafadhali ZINGATIA NA JIANDAE
UWEZEKANO WA KUTOKEA: **WA WASTANI**
KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (Miti midogo na matawi ya miti kuanguka, Kuvurugika kwa usafiri katika maeneo mengi, Uharibifu wa nyumba na miundombinu katika maeneo machache mfano bati kung'oka, changamoto kwa shughuli za ziwani, Uwezekano wa vyombo vidogo vya baharini/ziwani kuzama n.k.)

Alama za Athari

Mafuriko	Upepo Mkali	Mawimbi Makubwa
Maporomoko ya Ardhi	Joto Kali	Mvua Kubwa

Jedwali la Kiwango cha Uhakika Dhidi ya Kiwango cha Athari Zinazoweza Kutokea

T: Tahadhari Kubwa
T: Tahadhari
A: Angalizo

UHAKIKA	NDOGO	WASTANI	KUBWA
MKUBWA (70% AU ZAIDI)	A	T	T
WA WASTANI (KATI YA 30%-70%)		A	T
MDOGO (30% AU CHINI)			A

KIWANGO CHA ATHARI

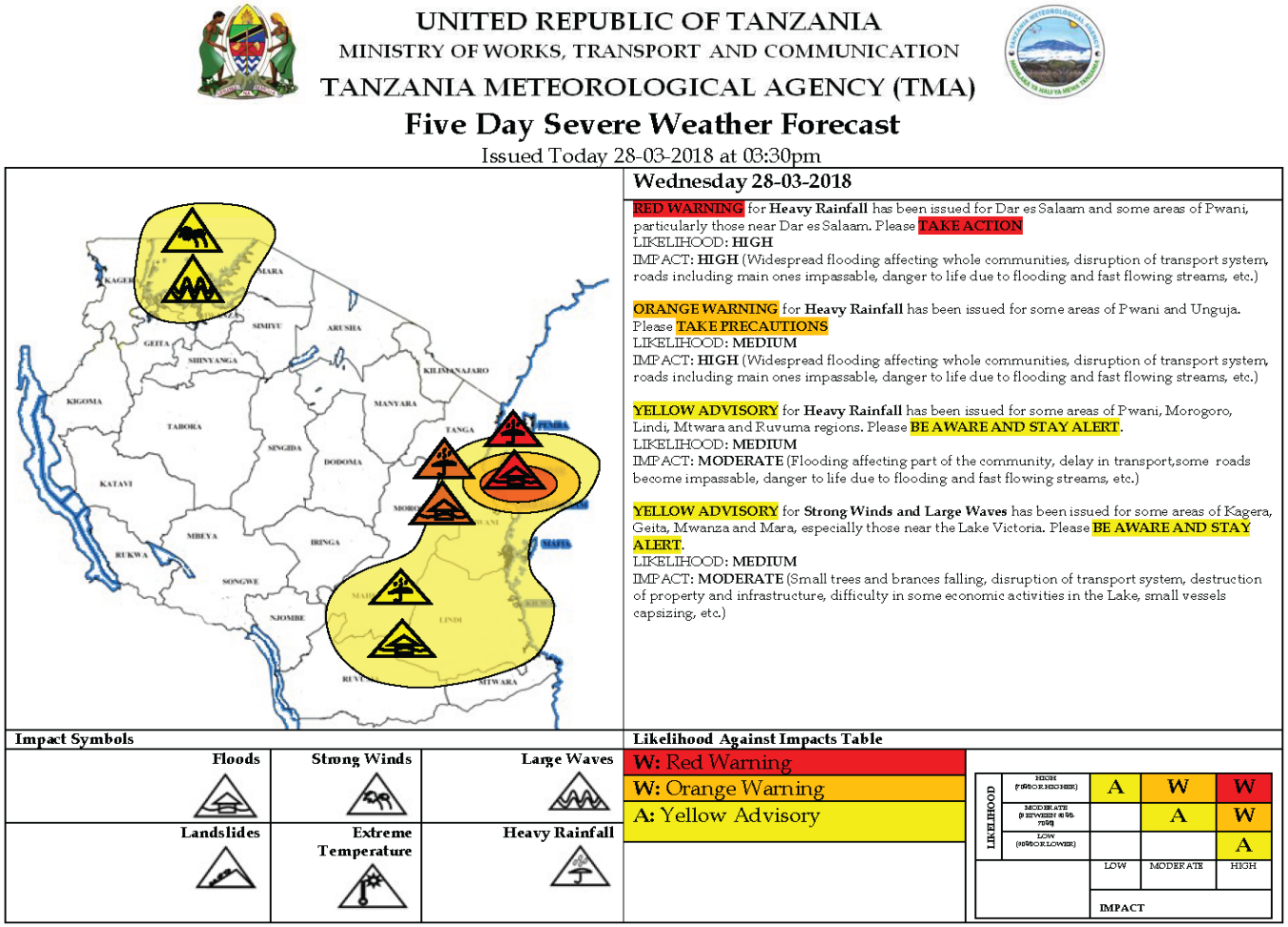
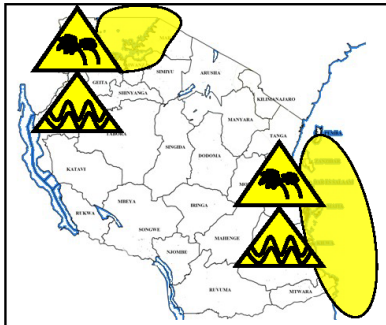
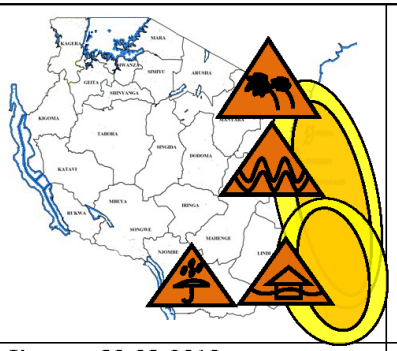
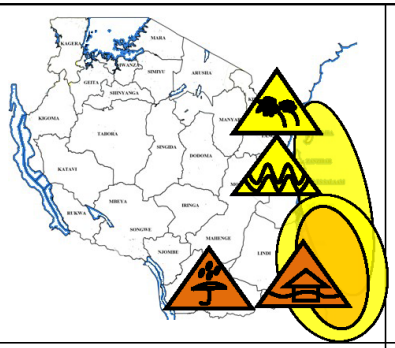
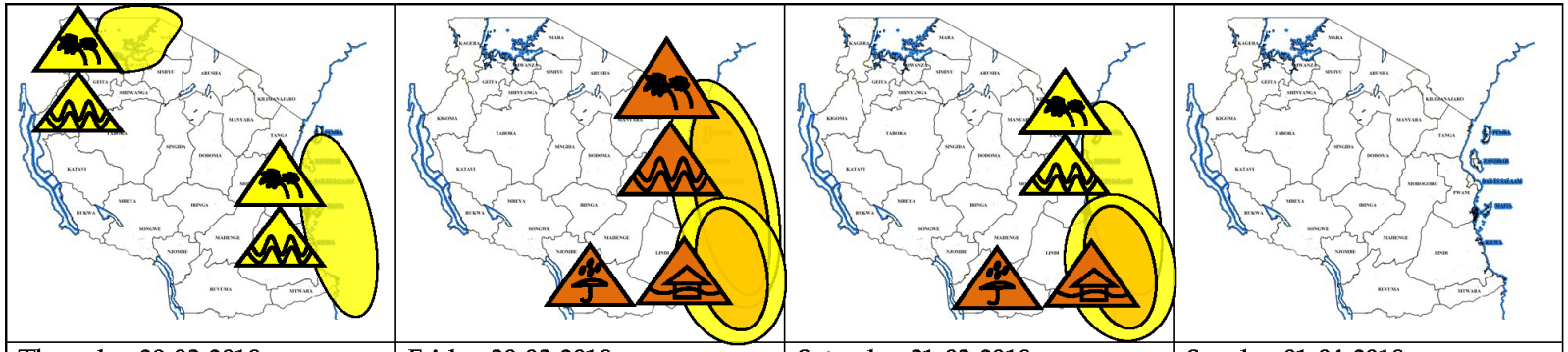


Figure 2: Example Flood Warning Product from the Tanzania Meteorological Authority (in Swahili and English) showing the "Yellow" advisory and "Orange" warning categories. (Source: TMA)

			
Alhamisi 29-03-2018	**Ijumaa 30-03-2018**	**Jumamosi 31-03-2018**	**Jumapili 01-04-2018**
ANGALIZO la Upepo Mkali na Mawimbi Makubwa limetolewa kwa maeneo ya mikoa ya Tanga, Pwani, Dar es Salaam, Lindi na Mtwara. Tafadhali ZINGATIA NA JIANDAE UWEZEKANO WA KUTOKEA: **WA WASTANI** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (kusita kwa baadhi ya shughuli za uvuvi na usafiri baharini, takataka kusambaa, vumbi, n.k.) ANGALIZO la Upepo Mkali na Mawimbi Makubwa limetolewa kwa maeneo ya mikoa ya Kagera, Geita, Mwanza na Mara, hususani maene yanayopakana na Ziwa Viktoria. Tafadhali ZINGATIA NA JIANDAE UWEZEKANO WA KUTOKEA: **MDOGO** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **KIKUBWA** (Tatizo kubwa la usafiri, Miti mikubwa kuanguka, hatari kwa maisha kutokana na vitu vinavyopepea (kama matawi, mabati, n.k.), Vumbi kutimka na kusababisha uono hafifu, Uharibifu mkubwa wa majengo na miundombinu ikiwemo kung'olewa kwa mabati, Hatari kwa maisha kutokana na uwezekano wa boti/meli kuzama, na athari zinazohusiana.)	TAHADHARI ya Upepo Mkali na Mawimbi Makubwa imetolewa kwa maeneo ya mikoa ya Dar es Salaam, Pwani, Tanga, Lindi na Mtwara pamoja na visiwa vya Unguja na Pemba; pia ANGALIZO limetolewa katika maeneo yanayozunguka. Tafadhali CHUKUA TAHADHARI UWEZEKANO WA KUTOKEA: **MKUBWA** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (kusita kwa baadhi ya shughuli za uvuvi na usafiri baharini, takataka kusambaa, vumbi, n.k.) TAHADHARI ya Mvua Kubwa imetolewa kwa maeneo ya mikoa ya Lindi na Mtwara; pia ANGALIZO limetolewa katika maeneo yanayozunguka. Tafadhali CHUKUA TAHADHARI UWEZEKANO WA KUTOKEA: **WA WASTANI** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (kama mafuriko katika baadhi ya maeneo, usafiri kuwa mgumu, hatari kwa maisha ya watu kutokana na maji kujaa au yanayopita kwa kasi,na athari zinazohusiana.)	TAHADHARI ya Mvua Kubwa imetolewa kwa maeneo ya mikoa ya Lindi na Mtwara; pia ANGALIZO limetolewa katika maeneo yanayozunguka. Tafadhali CHUKUA TAHADHARI UWEZEKANO WA KUTOKEA: **WA WASTANI** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **KIKUBWA** (kuanguka kwa majengo, mafuriko katika maeneo mengi, kutokea kwa magonjwa kama vile kipindupindu na malaria, barabara kutopitika, hatari kwa maisha ya watu kutokana na maji kujaa au yanayopita kwa kasi, n.k.) ANGALIZO la Upepo Mkali na Mawimbi Makubwa imetolewa kwa maeneo ya mikoa ya Dar es Salaam, Pwani, Tanga, Lindi na Mtwara pamoja na visiwa vya Unguja na Pemba. Tafadhali ZINGATIA NA JIANDAE UWEZEKANO WA KUTOKEA: **WA WASTANI** KIWANGO CHA ATHARI ZINAZOWEZA KUTOKEA: **CHA WASTANI** (kama changamoto kwa baadhi ya shughuli za uvuvi na usafiri baharini, ugumu wa upatikanaji wa samaki, takataka kusambaa, vumbi na athari zinazohusiana)	Hali Mbaya ya Hewa Haitarajiwi



Thursday 29-03-2018	Friday 30-03-2018	Saturday 31-03-2018	Sunday 01-04-2018
YELLOW ADVISORY for **Strong Winds and Large Waves** has been issued for some areas of Tanga, Unguja, Pwani, Lindi and Mtwara. Please BE AWARE AND STAY ALERT. LIKELIHOOD: **MEDIUM** IMPACT: **MODERATE** (halt in fishing and some transport activities, spreadof dirt,dust, etc.) YELLOW ADVISORY for **Strong Winds and Large Waves** has been issued for some areas of Kagera, Geita, Mwanza and Mara, especially those near the Lake Victoria. Please BE AWARE AND STAY ALERT. LIKELIHOOD: **MEDIUM** IMPACT: **MODERATE** (such as small trees and brances falling, disruption of transport system, destruction of property and infrastructure, difficulty in some economic activities in the Lake, small vessels capsizing, and associated impacts.)	ORANGE WARNING for **Strong Winds and Large Waves** has been issued for some areas of Tanga, Unguja and Pemba, Pwani, Lindi and Mtwara; also, an ADVISORY has been issued for surrounding areas. Please TAKE PRECAUTIONS LIKELIHOOD: **HIGH** IMPACT: **MODERATE** (halt in fishing and some transport activities, spreadof dirt,dust, etc.) ORANGE WARNING for **Heavy Rainfall** has been issued for some areas of Lindi and Mtwara; YELLOW ADVISORY has been issued in surrounding areas. Please TAKE PRECAUTIONS LIKELIHOOD: **MEDIUM** IMPACT: **MEDIUM** (such as flooding affecting part of the community, delay in transport,some roads become impassable, danger to life due to flooding and fast flowing streams, and associated impacts.)	ORANGE WARNING for **Heavy Rainfall** has been issued for some areas of Lindi and Mtwara; YELLOW ADVISORY has been issued in surrounding areas. Please TAKE PRECAUTIONS LIKELIHOOD: **MEDIUM** IMPACT: **HIGH** (Buildings collapsing, flooding over many areas, water born diseases like chorela and malaria, roads impassable, danger to life due to flooding and fast flowing streams, etc.) ANGALIZO la Upepo Mkali na Mawimbi Makubwa imetolewa kwa maeneo ya mikoa ya Dar es Salaam, Pwani, Tanga, Lindi na Mtwara pamoja na visiwa vya Unguja na Pemba. Tafadhali ZINGATIA NA JIANDAE LIKELIHOOD: **MEDIUM** IMPACT: **MODERATE** (such as difficulty in some of fishing and transport activities, difficulty in catching fish, spread of trash and dust, and associated impacts.)	No Severe Weather is Expected

Figure 3: Example four-day forecast product from the Tanzania Meteorological Authority (in Swahili and English) showing "Yellow" advisory and "Orange" warning categories. (Source: TMA)

The EOC receives all TMA products including watches and warnings via text (e.g. WhatsApp, SMS), email and phone calls, and ensures that information is routed to appropriate jurisdictions. The EOC also coordinates with the TMA to identify potential flooding impacts. In addition to sending region-wide text and email notifications regarding potential threats, the EOC coordinates conference calls with other regions, districts, and the Prime Minister's Office-Disaster Management Department (PMO-DMD) to provide up-to-date situation reports (SitRep) to partner organizations at all levels of government, and the nonprofit and private sectors. The Communication and Warning ERF Team will also monitor the situation on the ground to update communication products and warning issues thru coordination with all ERF groups and local government officials thru radio communications, cellphone, and WhatsApp. The Communication and Warning ERF Team shall also use as part of additional information news from the media and other similar platforms, to achieve a better situational awareness of the flooding and provide a better common operating picture.

Notification Resources

Flood warnings include notifications about cancellations, closings, states of emergency, evacuation, and other critical information that is designed to help the recipient avoid heightened threats to safety and security. Warning methods vary depending on location and available resources. All DarMAERT members shall be notified of all situation updates such as flood levels, weather updates, actions taken, affected areas, number of casualties, etc., and all coordination efforts thru WhatsApp, cellphone, and other radio communications equipment.

- **Search and Rescue**

Lead Agency: Tanzania Fire and Rescue Force (TFRF)

Flood-specific response protocols:

- Upon activation of the contingency plan, all key representatives of Search and Rescue (SAR) Emergency Response Agencies headed by the lead agency will have to convene at the EOC to undertake coordination work.

- The SAR Emergency Response Agencies shall organize 7-person teams composed of a rescue leader, 5 rescue specialists, and a logistics officer to perform the following functions:

Table 6. Search and Rescue team composition and functions

Team Composition	General Responsibilities
1 Team Leader	• Communicates with, and reports directly to the Incident Management Team (IMT) within the Incident Command System structure • Receives work instructions from the IMT • Decides which assets and Search and Rescue equipment should be used to perform specific tasks such as swift water rescue of trapped residents, conducting surveillance for survivors in the event of a collapsed building (including residential structures), and evacuating survivors using swift water rescue boats. • Monitors work rotations to ensure proper rest cycles of Search and Rescue responders • Ensures safety of the rescue operation • Maintains a log of all events, actions, and expenditures •
5 Rescue Specialists	• Carry out work instructions from the Team Leader to execute Search and Rescue response operations. Use the tools, equipment, and accessories correctly and safely. • Update the Team Leader on the progress of the response operation.
1 Logistics Officer	• Distributes rescue tools and equipment to rescue specialists, and maintains logs of the status of all equipment during the operation. • Ensures the proper return and check-in of equipment once the response operation is complete, as well as note any equipment that has been damaged. • Coordinates with the Team Leader if additional equipment is needed to execute a rescue mission. •

Each SAR team shall:

- Check in to the established ICP and receive instructions under the supervision of the IMT
- Observe 12-hour shifts to prevent premature exhaustion.
- Utilize the principle of triage to determine the order of priority to respond to casualties.
- Work in pairs. There shall always be a second rescuer to stand behind to provide physical support and monitor safety. Working in pairs also provides the opportunity for rotations and rest.
- Account all victims treated/responded to by recording important details such as

name, age, sex, and address.

- Transport victims who do not need hospitalization to the nearest evacuation area as instructed by the IMT.
- Retrieve and endorse human remains to the Municipal Health Office for proper documentation and disposal (burial). Only a doctor can officially declare a victim dead.
- Report all actions taken to the IMT for subsequent reporting to the EOC.

The Search and Rescue Emergency Response Agencies shall provide additional SAR resource augmentation to the IMT upon request of the IC. In the event that additional resources are requested, the Search and Rescue Emergency Response Agencies shall endeavor that the resources requested are both *efficient*—i.e. highly targeted and "right-sized" to the need of the response operation—and *effective*—i.e. the equipment and personnel being requested have appropriate functions best suited to the specific rescue operations. The DarMAERT EOC shall provide a coordination role under the Search and Rescue ERF and related stakeholders for search and rescue missions, including the Tanzania Police Force, Tanzania Fire and Rescue Force, TANESCO, and the Municipal Disaster Coordinators

Priority shall be given to the very young (0-7 y/o), old (60 y/o above), pregnant, and persons with disabilities (PWDs). The severely injured with life-threatening conditions, but with a high chance of survival, are to be responded first, followed by the less severely injured. Next will be the walking wounded and the last will be those with remote chances for survival.

Flood-specific Needs and Activities:

Table 7 represents the *needs* of Search and Rescue ERF as well as the corresponding *activities* required to prepare for effective and efficient response in large-scale flooding incidents:

Table 7. Sample SAR ERF needs and corresponding activities (template)

Needs	**Activities/ Arrangements to Meet the Needs**	**Responsible Offices**	**Timeframe**
Manpower	Organize Teams		D – 4 months
	Ensure teams are fully equipped		D – 1 month
SAR equipment	Request for purchase of additional equipment if required, including boats, ropes, floatation devices, and Personal Protective		D – 4 months

Needs	Activities/ Arrangements to Meet the Needs	Responsible Offices	Timeframe
	Equipment (helmets, boots, gloves, and eye protection).		
	Conduct maintenance and repair on equipment		D – 3 months
	Distribute equipment to SAR team members		D – 1 month
Cadaver bags	Request for the availability of cadaver bags		D – 3 months
	Distribute to SAR team members		D – 1 month
Food and safe water for SAR Teams	Contract of catering services		D – 3 months
	Distribution of food and water to responders before deployment		D – 1 day to
Helicopters	Request for the availability of helicopter assets		D – 3 months
	Prepare helicopters for response operations		D – 1 day to
Dronee	Request for the availability of Drones and flying permission		D – 3 months
	Prepare Drones for response operations		D – 1 day to

Resource Inventory: The following table shows the available resources to perform Search and Rescue:

Note: To be populated by the Planning Section Commander and Operations Section Commander during the Plan Maintenance process.

Table 8. Template Resource inventory for Search and Rescue activities

Resources	Unit	Quantity	Office/Agency	Resource Location	Remarks
Multi cab	unit				
Manpower	personnel				
Ring buoy	pcs				
Diving Equipment	set				
Regulator	set				
Buoyancy Compensator Devices (BCD)	set				

Resources	Unit	Quantity	Office/Agency	Resource Location	Remarks
Scuba Tanks	set				
Lifejackets	pcs				
Kayak	unit				
Fins	pairs				
Facemask	set				
Marking Buoy	pcs				
Megaphone	unit				
1Base	set				
Telescope	unit				
Spine board	pcs				
Oxygen Regulator	unit				
Trauma Bag	pcs				
Manpower	personnel				
Vehicle	unit				
Motorboat	unit				
Base Radio	unit				
Search and Rescue dogs	pcs				
Manpower	personnel				
Handheld Radio	unit				
Diving Equipment	sets				
Small boat	unit				
Speedboat	unit				
Manpower	personnel				
Base radio	pcs				
Speedboat	unit				
Manpower	personnel				
Manpower	personnel				
Manpower	personnel				
Manpower	personnel				
Aluminum Boat (AB-220)	unit				
Search and Rescue 3504 Vessel	unit				
Rubber Boat	unit				
Motorcycle	unit				
Very High Frequency (VHF) Marine Ban	unit				
Face Mask	pcs				
Wet Suit	pcs				
Diving Knife	pcs				
Flippers	pair				
Descending line/Rope	meter				
Power Generator	Unit				
Speedboat	pcs				
Rope	meter				
Megaphone	pcs				
Ambulance	unit				

Resources	Unit	Quantity	Office/Agency	Resource Location	Remarks
Lifebuoy	unit				

Needs Projection and Resource Gap Identification:

Resources allocated to one day under the SAR ERF will be used for the rest of the response operation. Based on this assumption, Table 11 (see next page) provides the projected needs and resource gaps for this ERF.

Note: To be populated by the Planning Section Commander and Operations Section Commander per the Plan Maintenance process

Table 9. Template comparison of needs projection and resources available for Search and Rescue

RESOURCE	**TARGET POPULATION**[29]		STANDARDS	**UNIT COST (TSH)**	**PROJECTED NEEDS**				**CURRENT RESOURCE**		**GAPS** (X PROJECTED – CURRENT)		**SOURCES TO FILL THE GAPS**
	FAMILIES	PERSONS			**1 DAY**		**(X) DAYS**						
					QTY	**COST (TSH)**	**QTY**	**COST (TSH)**	**QTY**	**COST (TSH)**	**QTY**	**COST**	
Manpower													
ICOM-Handheld Radio													
Multi Cab													
Lifebuoy													
Ring buoy													
Diving Equipment													
Regulator													
BCD													
Scuba Tanks													
Lifejackets													
TOTAL													

[29] Target population refers to the number of families/persons that the "resource" could respond to.

- **Shelter and Mass Care**

Lead Agency: RCO – Regional Social Welfare Department

Additional information specific to the ERF 8 – Shelter and Mass Care for flood-related protocols and guidelines are provided below:

Pre-Landfall Shelter Demand

As the flood/storm approaches, evacuee occupancy in shelter hubs is expected to steadily increase until the onset of hazards. In catastrophic situations, shelter populations may increase or remain substantial for many days. A sample projection is presented in Table 10 below.

Table 10. Sample projected shelter demand during a mass evacuation

Timeframe	Shelter Demand
H-120 to H-72	A limited number of evacuees leave the coast/flood-prone areas and do not typically seek public shelter.
H-72 to H-36	Spontaneous evacuation is expected to begin.
H-36 to H-24	Increased forecast certainty allows jurisdictions to open additional shelters in areas with high demand.

Shelter and Mass Care

Catastrophic flooding can cause the evacuation of multiple coastal, riverside, and low-lying areas. While many evacuees plan to stay in commercial lodging or with relatives and friends, some may require public shelter and other mass care services. These services may include the provision of temporary shelter, water, food, ice, short-term medical care, clothing, disaster survivor identification services, crisis counseling, pastoral care, functional needs support services, and other essential assistance to people who have been displaced from their homes.

Mass Care Planning

Shelter and Mass Care ERF shall work closely with local jurisdictions to pre-identify sufficient shelter capacity to provide short-term emergency shelters for the maximum estimated number of flood evacuees and their service.

Sheltering Coordination

TRCS chapters shall provide shelter information to the EOC for entry.

All Municipal Coordinator shall review shelter reports pertaining to their area of responsibility, in order to submit shelter status reports to the EOC. These reports are used in part to determine the need to open additional shelters throughout the region.
Municipal Coordinators shall be asked to submit daily shelter status reports. EOC shall track shelter activity at the local level and through coordination with the TRCS manager.

Shelters

Shelter hubs shall be established along evacuation routes in areas with adequate infrastructure and resources to provide mass care support for large numbers of evacuees. Shelter hub sites are pre-identified and opened in advance of coastal or riverside or low-lying areas evacuation orders.

Reception Centers

Reception centers shall be used by some shelter hubs to receive evacuees in host jurisdictions. The physical address of the reception center shall be provided to evacuating jurisdictions before evacuee embarkation. Upon arrival, evacuees may be triaged, registered and assigned to a shelter. Reception centers shall provide evacuees with directions to the shelter facility and a registration form to fill out.
Reception centers shall work with the EOC to track daily operational status of shelters, occupancy for each shelter and number of evacuees processed by the reception center. The information is forwarded to the ERF 8 or Municipal Coordinators and is compiled into shelter reports that are forwarded to the EOC.

Shelter Logistics

Proper resource management is essential for successful shelter and care of evacuees before, during, and after flooding. Shelter resources shall be provided by a combination of government and voluntary organizations.
Each shelter hub shall be supported by a pre-identified resource staging area with the capacity to receive and store pre-positioned catastrophic shelter relief packages.
Overall sheltering operations shall be executed through the activation and operation of multiple components. These components include embarkation centers, reception centers, resource staging areas, shelter hubs, shelters, and shelter resources (people and supplies). Shelter operations also involve shelter coordination, communication, the health and safety of evacuees, and transitional housing considerations after shelters close.

ERF 8 shall also provide support to local feeding operations. In widespread catastrophic flooding events, local resources for feeding disaster survivors are usually exceeded,

requiring additional support from regional and, in nationally declared disasters, national agencies to supplement those resources.

Non-governmental organizations (NGOs) such as TRCS traditionally respond to disasters by delivering mass feeding with available resources in accordance with the requirements of their charter; and they coordinate, facilitate and work with the EOC.

The process of mass care feeding shall include situation assessment, coordination, governmental resources, resource management reporting and coordinating food support for people with disabilities and others with access and functional needs.

Mass Care Feeding Phases and Timeline

The three phases of mass care feeding – immediate, sustained, and long-term – are outlined in Table 11 below.

Table 11. Phases of Mass Care Feeding

Phase	Beginning/End	Key Players
Immediate	Begins with or in anticipation of an incident. Snacks, shelf-stable meals, and/or light meals are obtained from various sources. Ends when a mass care infrastructure has been established.	Local non-governmental organizations. Local emergency management.
Sustained	Begins when a mass care infrastructure and logistical support are in place and producing meals. Ends when sustained disaster feeding is no longer required.	Local- and national-level non-governmental organizations. Local, regional, and national (in a nationally declared disaster) emergency management.
Long Term	Begins when the restoration of utilities allows residents to cook meals in their homes and purchase food in stores. Sometimes food and/or financial assistance to purchase food are made available to those who need assistance.	Local and national-level non-governmental organizations. Local, regional, and national (in a nationally declared disaster) emergency management.

3.1.2. Budget and Resource Summary

The total budgetary and resource requirements for the acquisition of needed resources for the flood contingency plan per Emergency Response Function are as follows:

Note: To be populated by the Planning Section Commander and Operations Section Commander per the Plan Maintenance process.

Table 12. Template Budgetary requirements of all ERFs

ERF /	Description	Current Resources (in TSH)	Cost of Projected Needs (in TSH)	Number of available resources/items	Gaps in number of resources/items	Amount of Financing Gaps (in TSH)	Potential Source of Funding
Total							

3.2. Concept of Operations

This section provides the operational procedures to guide DarMAERT in the implementation of this plan in response to major flooding in Dar es Salaam.

3.2.1. General Organization

In accordance with the principles of the Incident Command System (ICS), the response to an emergency or disaster is managed at the lowest level possible, beginning with on-scene incident response. DarMAERT is responsible for emergency response within the Dar es Salaam region. [30]. As such, DarMAERT plays a coordinating role with all aspects of ICS in the Dar es Salaam region, ranging from monitoring on-scene response to coordinating between other sub wards, wards, and municipalities should an incident require a greater level of coordination.

[30] Operational Area is an intermediate level of the regional emergency organization, consisting of a region and all political subdivisions within the regional area.

When a significant emergency, such as major flooding, exceeds the capacities of Dar es Salaam to respond, DarMAERT may request assistance from neighboring jurisdictions through the Mutual Aid system[31] or from the Central Government for Tanzania.

3.2.1.1. Organizational Role of the DarMAERT EOC

The DarMAERT EOC is the focal point for emergency management coordination within the Dar es Salaam region. In contrast, local governments (such as municipalities, wards, and sub-wards), departments, and agencies with emergency response responsibilities will manage the operations of their specific resources, including tactical operations of field units during day-to-day emergencies, for example, such as small-scale structural fires or small-scale road accidents, that do not require greater levels of coordination beyond basic on-scene incident response. Once the EOC is activated, all ERF Agencies shall send a representative or an ERF coordinator to the DarMAERT EOC.

- During an actual flood, the primary responsibility for the welfare of residents and the protection of property rests with DarMAERT. Upon receiving a flood message, local governments (city, municipality, and ward) should monitor their local conditions and determine the appropriate action.
- During a flood, TMA and Ministry of Water and Irrigation (MoWI) authorities will continue to provide updated information, as well as technical advice on flood mitigation.
- Upon the receipt of notification from TMA that a flood event will potentially reach "extensive" or "catastrophic" levels, DarMAERT shall implement its Flood Contingency Plan.
- In circumstances where a flood emergency is beyond the capacity of DarMAERT, regional or national assistance can be requested through the DarMAERT EOC.
- During the emergency, the TMA and MoWI representative will continue to advise the DarMAERT EOC of the status of the situation. The EOC will be responsible for updating and relaying information related to the emergency to all members and other organizations/ individuals.

3.2.1.2. DarMAERT EOC Operations

The focal point of coordination for region-wide emergency response is the EOC, located on the 1st Floor, Ilala Fire and Rescue Station, Ilala District, Dar es Salaam Region. Per the Standard Operating Procedures Handbook for the DarMAERT EOC, DarMAERT shall operate the EOC according to the structure of the "Planning P" cycle within the EOC, which sets forth a schedule for producing information products such as the Situation Report and Incident Action Plan.

[31] In emergency services, mutual aid is an agreement among emergency responders to lend assistance across jurisdictional boundaries.

This framework is fully aligned to the DarMAERT Standard Operating Procedures Handbook and is reviewed below in Figure 4.

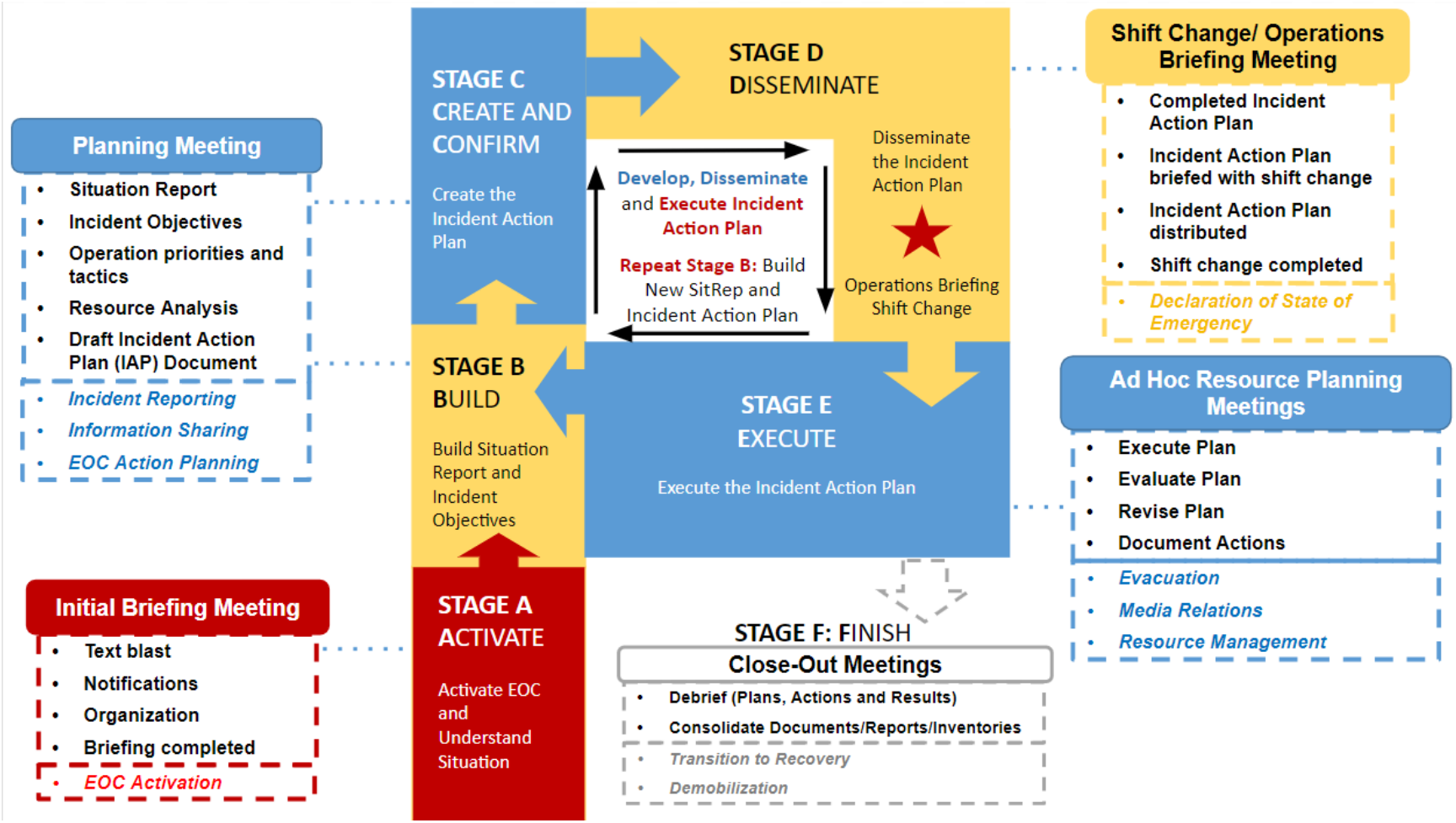


Figure 4. The Planning P Framework (EMI, 2020 from FEMA, 2018)

The initial Operational Period of the Planning P navigates through the six stages, namely, **A**ctivate, **B**uild & **C**reate, **D**isseminate, **E**xecute and **F**eedback and **F**inish. The initial Operational Period begins with Stage A (which is only performed once) and is implemented until Stage E when the Operational Period ends. Succeeding Operational Periods will begin with Stage B and end with Stage E. The actions in subsequent Operational Periods are updated based on feedback from the preceding period. The entire Incident Action Plan process ends with Stage F (Finish) when operations are concluded and the EOC is deactivated.

3.2.1.3. General Objectives for Response Operations

Immediately following a major flooding event, and for as long as the DarMAERT EOC is activated, response to flooding will be the priority of all DarMAERT Emergency Response Agencies. All available DarMAERT emergency response personnel will be directed to achieve the following objectives[32]:

- Save lives.
- Reduce immediate threats to life, public health and safety, and public and private property.
- Provide necessary care, shelter, and medical services to Dar es Salaam residents and other members of the general public.
- Restore the operations of facilities, whether public or privately owned, that are essential to the health, safety, and welfare of the community, including critical Dar es Salaam facilities, hospitals, utilities, and transportation infrastructure.
- Assess damage to infrastructure, public facilities, and the built environment, as well as other related needs.
- Expedite the restoration of services, the economy, and the community at large; and begin the process of recovery.
- Keep the public informed.

3.2.1.4. Coordination with National EOCC and National Agencies

The impact of major flooding will necessitate coordination with National EOCC and National agencies to:

- Coordinate response operations.
- Request assistance to meet needs that cannot be met with Dar es Salaam resources or with Mutual Aid resources available from nearby regions/cities.

[32] Please note that these objectives are collectively based on the DarMAERT 2020 Emergency Response Plan Update, derived from the general guidelines of the Emergency Response Functions.

The DarMAERT EOC must direct all resource requests that could be met by National EOCC or National agencies to the Regional Administrative Secretary.

DarMAERT may coordinate directly with the National EOCC or National agencies as part of specific incident response operations, particularly when necessary to save lives and protect public safety.

3.2.1.5. Transition to Recovery

The immediate response to major flooding will focus on life-saving operations, providing resources to sustain Dar es Salaam residents—such as sheltering and mass care-- and stabilizing the situation through on-scene emergency response operations. As response operations are completed, Dar es Salaam will transition to a phase in which recovery operations take precedence. Given the level of damage to housing, business, roads, and infrastructure; the direct impact on the population, and the effect on the regional economy, full recovery from major flooding may take anywhere from months to years based on the scale of the disaster. Recovery operations range from initial relief operations—such as the provision of emergency housing—to long-term "resilient recovery" operations in which vital Disaster Risk Reduction projects are executed—such as improving drainage systems.

Within the first few days of activation, the triggers for a transition from EOC response to recovery operations (EOC deactivation) should be determined as an Incident Objective and shared with EOC staff. Metrics for beginning recovery operations may include:

- Search and Rescue (SAR) operations have concluded.
- Evacuations have ceased.
- Mutual Aid response resources are being released.
- Care and shelter operations have stabilized and the population in shelters is decreasing daily.
- The water level is receding in the streets and river channels.
- Restoration of utilities and lifelines is underway.
- Local Assistance Centers are in operation.
- DarMAERT member personnel and assets are safely demobilizing and being accounted for by the Operations Section Commander and the Logistics Section Commander.

At this point, the EOC may consider scaling back staffing to partial levels or may transition to a full recovery operation. The recovery operation can be organized with an ICS structure and may be carried out in a facility other than the EOC or may be performed in several separate departmental locations. In the case of a large-scale flooding disaster

requiring a complex recovery, the Prime Minister's Office-Disaster Management Department (PMO-DMD) may establish a recovery operations center, with DarMAERT serving as a support node to the center for support coordination within the Dar es Salaam region.

3.2.2. Communication and Flood Forecasting Processes

Flood forecasting Subject Matter Expertise is provided by the Tanzania Meteorological Authority (TMA). Weather forecasting alerts and products are both briefed by TMA officials during briefings during the Planning P cycle and are transmitted to DarMAERT members via DarMAERT's WhatsApp social media channel as well as by e-mail. It should be noted that DarMAERT has access to the Floodtag flood forecasting dashboard (which is not government-owned) to support monitoring water levels in areas within the Misimbazi Basin. However, DarMAERT leadership shall determine whether to operationalize this dashboard because only TMA has the mandate to issue flood warnings.

Typically, DarMAERT monitors evolving flood situations by monitoring the news, social media, and communications with ward and sub-ward leaders and government staff to refine response actions across specific geographic locations.

DarMAERT's WhatsApp social media channel is a vital medium to exchange information, as is e-mail and Very High Frequency (VHF)/Ultra High Frequency (UHF) radio communications. This VHF/UHF communications equipment has been provided to DarMAERT members and maintains a radio link to the DarMAERT EOC.

3.2.3. Situation Assessment

3.2.3.1. Situation Assessment Overview

While the ability to quickly assemble, verify, analyze, and hand out confirmed situation information is vital to the response, it is equally important that initial response strategies are developed with an accurate picture of the potential scope of the disaster and that external resource requests quickly be pushed up to the DarMAERT EOC and National EOCC level without delay. Quickly identifying the potential scope of damage following major flooding is critical to mounting an effective response. However, initially, this may be extremely difficult due to limited communications capability, information overload, limited staff, and fragmented or conflicting damage reports.

This Flood Contingency Plan is based on projected impact scenarios of extremely severe weather that are believed to present the greatest risk. Response strategies and resource

requirement projections contained in this plan are calibrated to "extensive" and "catastrophic" scenarios, so responders can initially utilize the impact and the resource requirement projections that most closely match the scope of the actual disaster. The plan assumes that it is better to form a quick picture of the potential scope of damage using a combination of actual street-level impact reporting and pre-event impact modeling, rather than total reliance on waiting two to three days for confirmed impact information to be available.

3.2.3.2. Determining the Potential Scope of the Disaster

Immediately following major flooding, it may be possible to establish an initial assessment of the impact using available analytical tools such as Rapid Damage and Needs Assessment (DANA). This assessment can be used to direct initial response activities towards those areas that are most likely to be seriously affected, given the location and magnitude of flooding and flash floods within the city. This process will be coordinated through the Municipal Disaster Coordinators.

3.2.3.3. Extreme Weather/ Flood Information

Key information about the flooding includes:

- Water level
- Location of flooded areas and level
- Amount of rainfall/intensity
- Cyclone strength and path
- Length of projected rainfall

3.2.3.4. Initial EOC Actions

Initially, the DarMAERT EOC will take the following steps to disseminate and refine information regarding the magnitude of the disaster:

- Determine the potential scope of flooding, including the extent, depth, and location of the flooded areas.
- Disseminate flood map information to the EOC Director and DarMAERT members so that they can incorporate information regarding potential damage into action planning.
- Transmit updates to flood map and damage projection information to the DarMAERT Officials, National EOCC, the Public Information Officer (PIO), and others as directed in accordance with situation report procedures.
- Analyze emerging situation information from sources such as field responders and the media to validate the overall consistency of scenario projections.
- Review and clarify incomplete or conflicting information.
- Confirm or guide the EOC Director and DarMAERT members on suggested

adjustments to the resource requirement projections based on updated information.

3.2.3.5. Initial Situation Assessment

This section describes available means for the initial collection and dissemination of information regarding the effects of the flooding.

Field Personnel Actions

Immediately following the flooding, various government emergency personnel and local government personnel assigned to different parts of the region will begin reporting on the effects of the flood. These reports will flow to dispatch centers and other points of collection. The specific number of Emergency Responders deployed at any given time varies will vary depending on the missions being responded to, as being coordinated by the DarMAERT EOC. Many of these employees, particularly those of public safety agencies, travel in radio-equipped vehicles or are carrying handheld radio equipment and cell phones (if the network is usable).

All DarMAERT personnel deployed in the field at the time of the event are expected to do the following:

- Assess their situation and identify any possible threats to life safety.
- Take action to protect themselves and members of the public in their immediate vicinity.
- Report time-sensitive life safety information to their dispatcher via radio or cellphone (take pictures if possible).
- Report non–life safety information within 60 minutes to their respective office/agency, either by radio or by cellphone, or email.
- Follow the response procedures established by their respective department/agency emergency plan.

In addition to DarMAERT personnel, NGO responders and Amateur Radio volunteers may be used to gather and transmit situation information. NGOs may include Very High Frequency (VHF) and Citizens Band (CB) radios, and foot and vehicle couriers to report damage and needs assessments.

Aerial Reconnaissance (Request to National EOCC or TPF)

Daylight aerial surveillance via helicopter or fixed-wing over-flight would allow response managers to quickly assess:

- General extent of the damage.
- Location of trapped/stranded civilians.

- Location of significant roadway damage or flooded, blockages, and potential alternate routes.
- Condition of potential staging areas.

3.2.3.6. Updates to Critical Information

Critical Information for the first 24 hours

- Number and locations of deaths and injuries.
- Location and extent of secondary events, including fires, landslides, and hazardous materials events.
- Location of severely damaged or collapsed structures due to flash floods.
- Location and estimated number of people trapped on top of their houses.
- Requirements for major evacuations and estimated number of people displaced.
- Status of communication systems, including:
  - Public telephone and wireless systems
  - DarMAERTs communications system
  - Tanzania Emergency Hotline 112
- Damage to critical public buildings and other infrastructure, including:
  - TFRF and TPF facilities
  - Hospitals and Health centers
  - Schools
  - Jails
  - City Halls or Government Buildings
- Critical resource shortfalls impacting public safety.
- Status (open, partial closure, or full closure) of roads, bridges, major surface streets, and public transportation systems.
- Status of and damage to major utility systems, including:
  - Water
  - Sewer
  - Power
  - Communication
- Results of preliminary assessment of evacuation centers
- Location and operational status of Emergency Operations Center (EOC).

3.2.4. Recovery

Immediately following major flooding, all available resources must be devoted to saving lives and property. Nonetheless, recovery efforts must begin as soon as possible and sometimes can occur concurrently with some response operations during response-to-recovery transitions.

Recovery phases will likely occur while the DarMAERT EOC (Emergency Operations) is in operation and will be managed through DarMAERT. Long-term recovery will be implemented through different mechanisms, described below.

3.2.4.1. Short-Term Recovery Strategies

This section describes key issues that must be addressed urgently when initiating short-term recovery operations. The Regional Recovery Plan will provide a strategy for addressing critical issues, such as those identified below, during the first 90 days following major flooding. The magnitude of these issues and the resources required to address them will necessitate regional approaches with assistance from the National Government and international partners. DarMAERT's short-term recovery efforts will be greatly enhanced by collaboration. DarMAERT Emergency Response Agencies would be involved in the initial recovery but DarMAERT EOC may demobilize. DarMAERT EOC may support the response-to-recovery transition.

Debris Removal Strategy

Debris must be removed from the region to allow resumption of services and business and make way for rebuilding.

1. Remove material from damaged structures and demolish unsafe structures.
2. Establish procedures to expedite the removal of unsafe structures.
3. Develop a plan for transporting debris to staging sites; separating, reducing, and recycling debris; and trucking to a disposal site.
4. Secure contracting of National resources to support long-term debris removal operations.
5. Collaborate regionally to address movement and disposal of debris in areas with limited landfill space.

Interim Housing Strategy

Emergency shelters are a short-term solution to the problem of displaced residents. They must transition to interim and long-term housing arrangements.

1. Establish a plan to determine interim and long-term housing needs, based on the needs of the shelter population.
2. Utilize Dar es Salaam resources, such as building inspectors, to work with shelter residents to determine whether they can move back into their homes if not damaged by floods.
3. Establish a housing recovery team to act as the lead for local housing planning efforts and immediately begin a working dialogue with National and international agencies engaged in the housing issue.

4. Collaborate nationally to reach a consensus regarding what type of housing is needed and where it should be placed.

Utility Restoration Strategy

Public and private utility providers will coordinate with ERF 10 – Damage Assessment, ERF 11 – Public Works and Engineering, and ERF 12 - Utilities, to assess the damage and restore utility services within the region. Restoration of services will be affected by the following:

- Key emergency response facilities will have backup power to continue operations temporarily while utility service is being restored.
- Water service and communications will be disrupted within the first several hours and could take weeks to be fully restored.
- Electrical power will be interrupted immediately and may take a few days or longer to restore.
- Repair sites may be inaccessible temporarily due to debris, flood, and damage to transportation infrastructure.

The strategy for restoring utilities includes the following:

1. Service providers will begin damage assessments immediately. Assessment results and information will be provided to ERFs 10 – Damage Assessment, 11 – Public Works and Engineering, and ERF 12 - Utilities. Collected information will form a separate damage assessment with other relevant information to be distributed to service providers upon availability.
2. Emergency restoration of lifeline utility services will be the top priority for the first 1-7 days after the event.
    - Service providers may implement interim repairs and establish temporary delivery systems.
    - Utility providers will restore services in accordance with their pre-established restoration priorities. ERF 11 will convey incident-specific restoration priorities to utility services providers, which will incorporate these priorities into their restoration plans.
    - ERF 11 will identify priorities for restoring services to facilities and services necessary for emergency response operations, hospitals and healthcare facilities, and continuity of government, as well as restoration of service to the greatest number of people.
3. ERFs 11 – Public Works and Engineering and 12 - Utilities will coordinate with ERF 5 – Law Enforcement to provide utility workers with access to repair sites.
4. Permanent restoration of utility infrastructure will occur after critical services are

restored on an interim basis and will continue for months after the major flooding.

3.2.4.2. Transitioning to Recovery Operations

Dar es Salaam's various local governments, departments, and agencies may have specific responsibilities for implementing recovery of their respective operations and proceeding with the restoration of their facilities. Recovery Operations that DarMAERT members may be involved in may include *response-to-recovery transitions* concurrent with the de-activation of 24 operations of the DarMAERT EOC (such as conducting Damage Assessments), *relief operations* (such as the provision of short-term emergency housing, which may last from weeks to months), to *long-term resilient recovery activities* such as the construction of durable long-term housing solutions and completing Disaster Risk Reduction projects, such as drainage system upgrades. Typically, recovery operations will be coordinated by the Prime Minister's Office – Disaster Management Department, with DarMAERT playing a coordinating role. During the transition to recovery, and de-activation of the DarMAERT EOC, the use of the Flood Contingency Plan will end. Subsequent flood-related recovery operations would be coordinated by recovery planning activities specific to the declared disaster. Command and Control

3.2.5. Features of the Emergency Operations Center (EOC)

The DarMAERT EOC is the repository of information and the main hub for coordination of DarMAERT. The DarMAERT EOC is a physical location in which the decision to activate the Flood Contingency Plan is made, based upon the analysis of TMA that a flood event may reach "extensive" or "catastrophic" severity levels. The DarMAERT EOC serves as the main communication link for all responding units, receives emergency and non-emergency calls, monitors the security and surveillance cameras of the municipalities, dispatches calls to concerned responding units, receives data and reports from responding units. The DarMAERT EOC is located on the first floor of the Ilala Fire and Rescue Station.

Staffing and Structure: The EOC shall be operated by the following personnel according to the organization structure, as set forth by the Standard Operating Procedures Handbook for the DarMAERT EOC (see Figure 5):

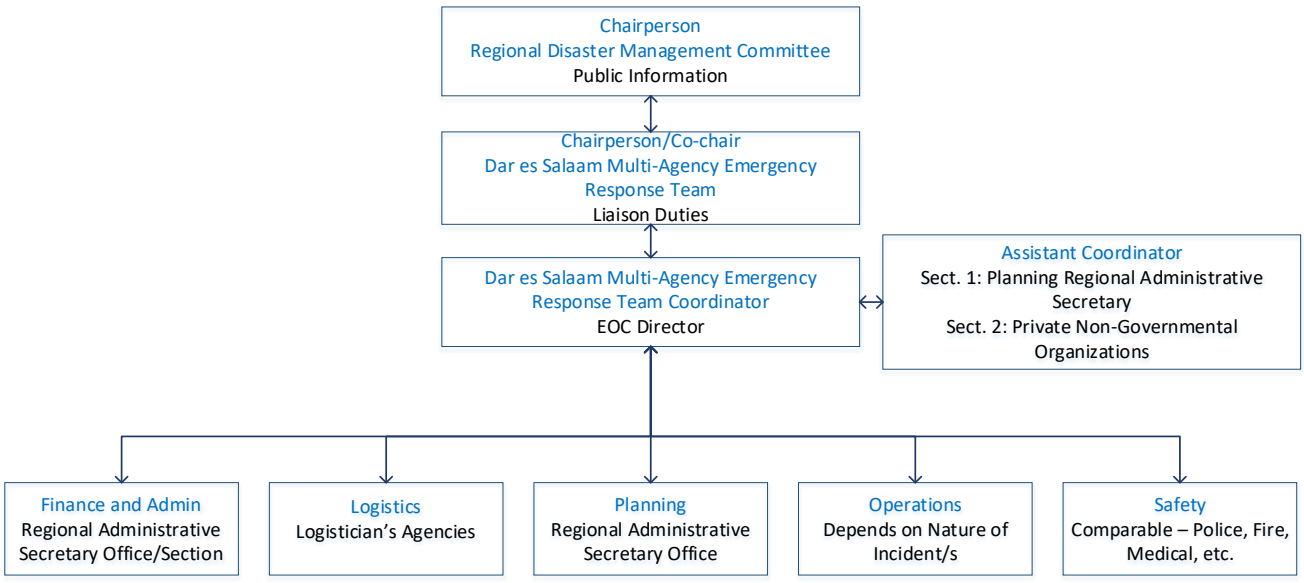


Figure 5. Proposed DarMAERT Incident Command System Command and General Staff Roles[33]

Activation: Per the DarMAERT Emergency Response Plan 2020 Update, activation of the DarMAERT EOC is by the declaration of the Regional Administrative Secretary of a major incident, based on situations such as:

- Control of an incident is beyond the response capabilities of the initial responding department;
- Disruption caused or likely to be caused is significant, i.e. escalation of emergency level (discussed in the succeeding sections);
- A Regional Emergency threatens, significantly impacts, or involves multiple agencies and/or political subdivisions;
- Pre-established hazard levels are reached.

Based on the ERP 2020, emergency levels are organized into a three-tier system to determine the level of EOC activation as follows:

Level 1: An emergency incident can be handled routinely by one or more departments and government agencies within the Dar es Salaam Region, requiring the only district/local resources. At this level, normal government operations are not affected, hence, not requiring activation of the EOC.

Level 2: An emergency requires a major response and the significant commitment of resources from the Regional Government and several departments and agencies. It has the potential to require resources over those available from the responding departments to bring the situation under control, hence, partial activation of the DarMAERT EOC.

[33] Source: Results of exercises and workshops with DarMAERT from Modules 1 thru 4 of TED delivery.

Level 3: An emergency requires an extensive coordinated response and commitment of resources from all departments and government agencies and could necessitate requesting external assistance from the Prime Minister's Office, bilateral donors, or international humanitarian organizations/development partners, including the UN Cluster System, hence, full activation of the DarMAERT EOC.

The Activation phase is observed upon reaching Emergency Level 2 or 3 (i.e. partial or full activation of the EOC, respectively), while the Alert and Standby phases are observed in all levels, even in Emergency Level 1. The DarMAERT Coordinator/EOC Director (as Incident Commander of the EOC) determines whether it is necessary to place the EOC into any one of the following three phases as needed:

Alert Phase involves notifying staff that an incident has taken place, but no immediate action is necessary at present.

Standby Phase encourages officers to consider the implications of an event that may prompt the engagement of resources, thus, the preparation of resources and staff. During this phase, the DarMAERT Coordinator/EOC Manager may call an emergency management team meeting to analyze the preparation and likely response of the Region.

Activation Phase involves the deployment of DarMAERT members to the EOC and coordination of the response operations under the direction of the Tactical Commander.

3.2.6. Features of Incident Command System (ICS)

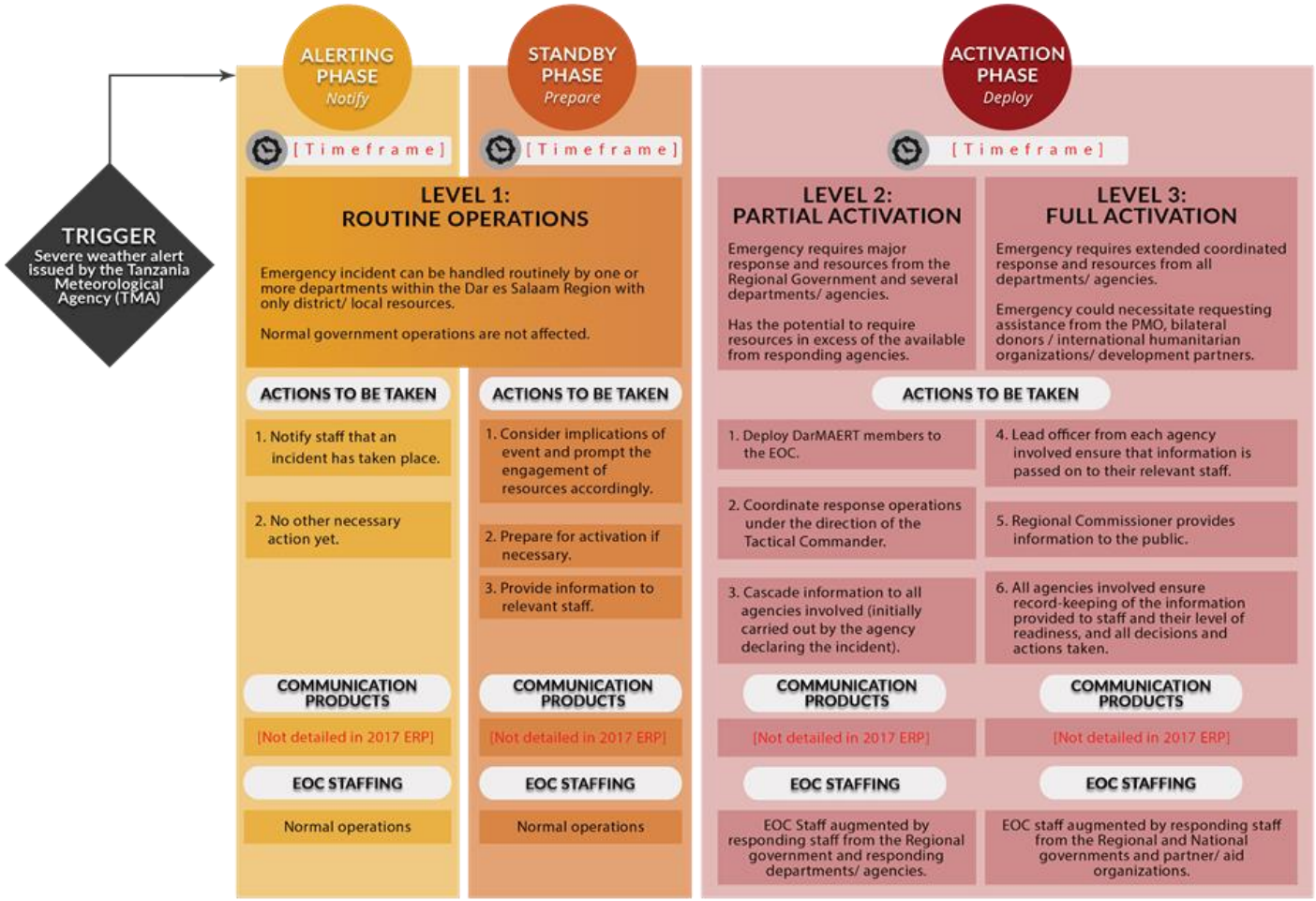


Figure 6. Summary of procedure for EOC activation per the Standard Operating Procedures Handbook for the DarMAERT EOC.

3.2.7. Interoperability

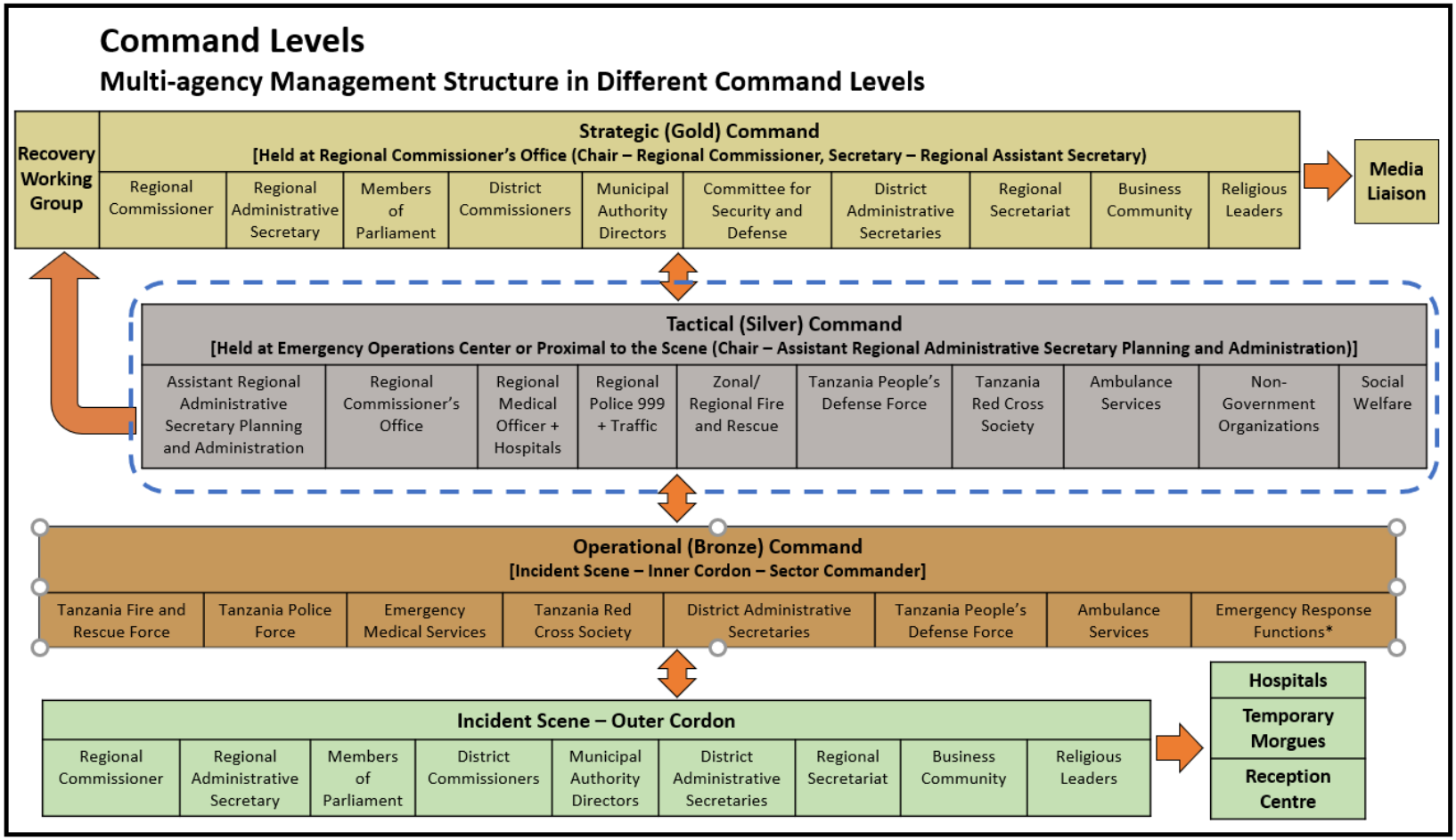


Figure 7. DarMAERT Command Level Structure as Prescribed by the NOG 2014

Source: Tanzan*ia National Operational Guidelines 2014*

3.2.7.1. District/Municipal Disaster Management Coordinator

District/Municipal Disaster Management Coordinators (MDMCs) are personnel stationed in their respective locality. Their role includes coordinating emergency preparedness activities, response, and recovery operations within their area. MDMCs deploy to incident sites to help assess the damage, identify urgent needs, and advise local officials and the DarMAERT EOC regarding the needed assistance, and coordinate deployment of emergency resources to assist local responders.

4. Plan Maintenance

This section discusses the activities associated with maintaining Flood Contingency Plan. These activities are recommended to assure that the Flood Contingency Plan remains an updated and functional document.[34] It is recommended to test this plan through exercises that should conducted on an annual basis and integrate exercise outputs into an updated version. This plan should also be revised following any DarMAERT EOC activations for a flood, and, through the revision process, integrate any key findings as suggested by After Action Reporting. Resource inventory tables currently indicated as templates should be populated as more information becomes available during each review cycle.

The DarMAERT Planning Section Commander and Operations Section Commander will establish procedures to ensure that information obtained from any real-world activations, as well as trainings, exercises and drills are incorporated into a corrective action process to update this plan. This evaluation process will include an *annual review/update* of the Flood Contingency Plan and all supporting documents.

The DarMAERT Planning Section Commander and Operations Section Commander will:

- Conduct a formal audit of the Flood Contingency Plan annually.
- Evaluate all areas of the Flood Contingency Plan and develop corrective actions based on any key findings.

To ensure that the Flood Contingency Plan always reflects current organizational conditions, any changes in DarMAERT's organizational structure, functions or mission, and service to clients will be reflected in the plan accordingly.

Major issues to be considered include:

[34] It should be noted that the initial prototype version of the Flood Contingency Plan DarMAERT was tested during FI-1 (Module 5) during November 2-6, 2020. The outputs from the After Action Report for FI-1 have been integrated into this version of the plan as the first iteration of the ongoing Plan Maintenance process.

- Identifying items or issues that affect how frequently changes to the Flood Contingency Plan will be required, such as the frequency of turn-over of DarMAERT members or the issuance of any national-level guidelines that may necessitate a plan revision.

- Establishing a review cycle

- Maintaining overall plan currency and readiness—to include procedures, equipment, systems, personnel, and rosters

- Advising the DarMAERT Coordinator on Flood Contingency Plan-related matters

- Coordinating among related plans, including the ERP 2020 Update, SOP Handbook, and EOC Handbook, as well as Standard Operating Procedures for Emergency Response Functions

- Conducting training, testing, and exercises to test DarMAERT flood contingency operations

- Updating plans annually to incorporate lessons learned from testing and exercises, as well as any actual events that occurred during the year. In addition to updating the plan annually, more frequent plan updates may be necessary under conditions that include:

- Employee contact numbers that change.
- New processes that are implemented.
- If substantive changes to existing mission-critical processes occur.
- Reorganization of DarMAERT's goals and objectives.
- Employee duties change within the scope of the plan.
- Results of exercises or drills compel change in the plan.
- Relevant regulatory changes occur.

Whenever the plan is updated, it shall be reissued with the update recorded.

5. Annexes

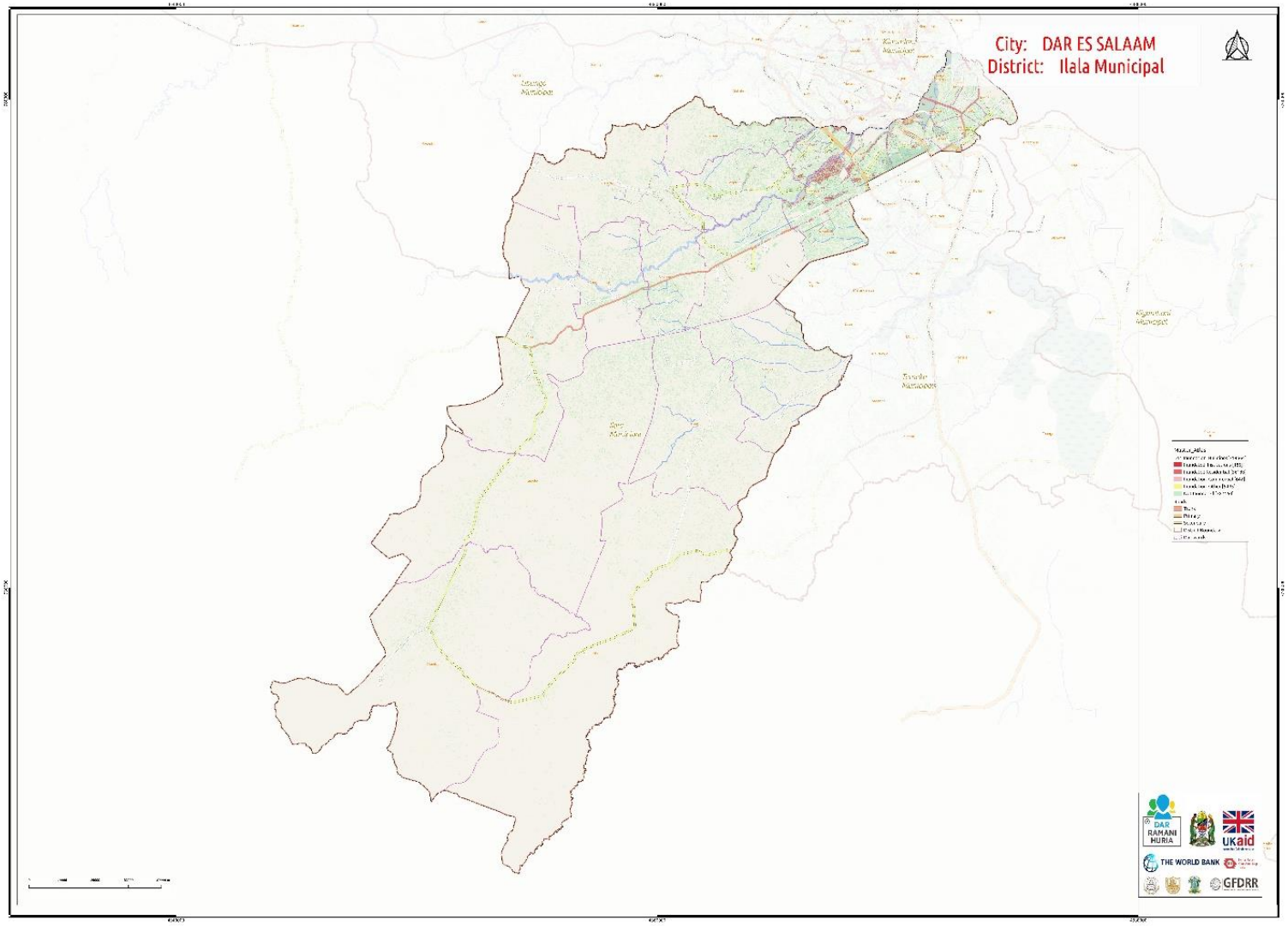
5.1. Annex 1: DarMAERT Directory

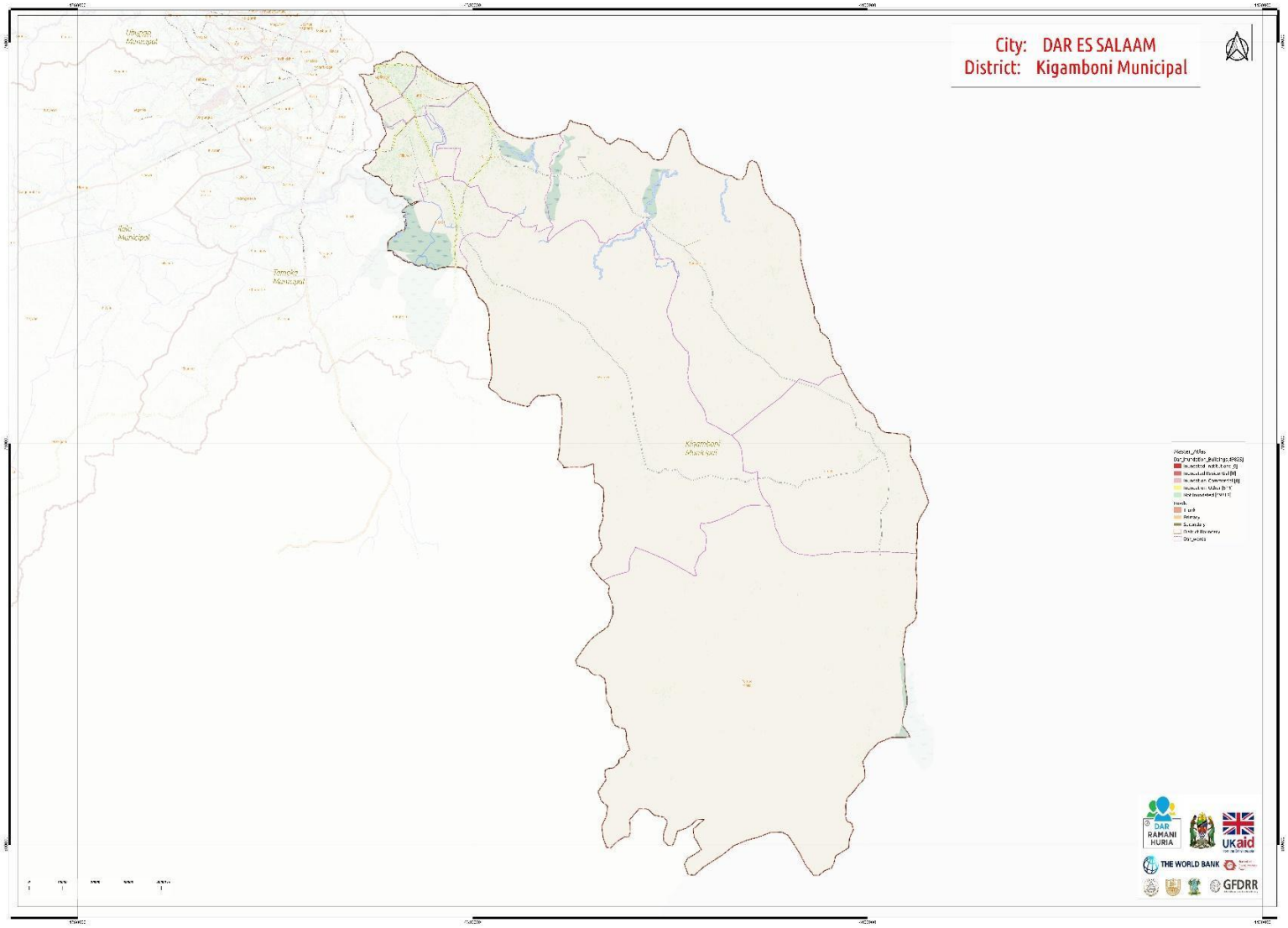
	Agency	Name	Position	Email address	Contact number
1	DarMAERT Secretariat	Mr. Christopher Mnzava	DarMAERT Consultant	mnzavachris60@gmail.com	0713327399
2		Mr. Rogasian E. Kimaryo	DarMAERT Secretary	rekimaryo@gmail.com	0754866376
3		Mr. Salum Hamidu	DarMAERT Coordinator and Geogprahic Information System Officer - Land Planning	salym407@gmail.com	0717351395
4		Ms. Grace Mtui Mawalla	Regional Coordinator - TRCS	gmmawalla@yahoo.com grace.mawalla@trcs.or.tz	0715364835
5		Ms. Upendo Charles	Information and Communications Technology Expert	upendocharles@gmail.com upendo.charles@dsm.go.tz	0713525969
6		Dr. Paschal Mgaya	Regional Emergency Coordinator	mgayadr@gmail.com	0652311109
7		Mr. Masalida Zephania	Social Welfare Officer & DRM expert	lida.zeph@yahoo.com	0717261320
8		Ms. Sikudhani Yotham	Disaster Risk Management Expert	sikudhaniyotham@yahoo.com	0713227865
9		Mr Juma Haule	Public Health Expert	dpjhaule@yahoo.com	0657588880
10		Mr. Lawrence Mtui	Disaster Risk Management Expert	lawrenceanton@gmail.com	0784302334
11		Dr. Amini Mshana	Private Ambulance Coordination	aminimshana@hotmail.com	0715543131
12	Fire & Rescue Force	SACF Salum Mohamed	Regional Fire Officer Kinondoni	kinondoni@frf.go.tz	0717065996
13		ASF Elisa Mugisha	Regional Fire Officer Ilala	elisa.mugisha@frf.go.tz	0713293581
14		INSP Isack Njombe	Fire and Rescue Operations Officer - Kinondoni	isacknjombe7@gmail.com	0654494004
15		INSP Michael Bachubira	Fire and Rescue Operation Officer - Temeke	michaelbachubira@gmail.com	0757359057
16		A/INSP Abdallah Ulutu	Fire and Rescue Operations Officer - Ilala	Aulutu6@gmail.com	0715851414
19	Police Force	ACP. Nasser Mwakambonja	Disaster Risk Management Expert	nassermwakambonja@gmail.com	0715999029

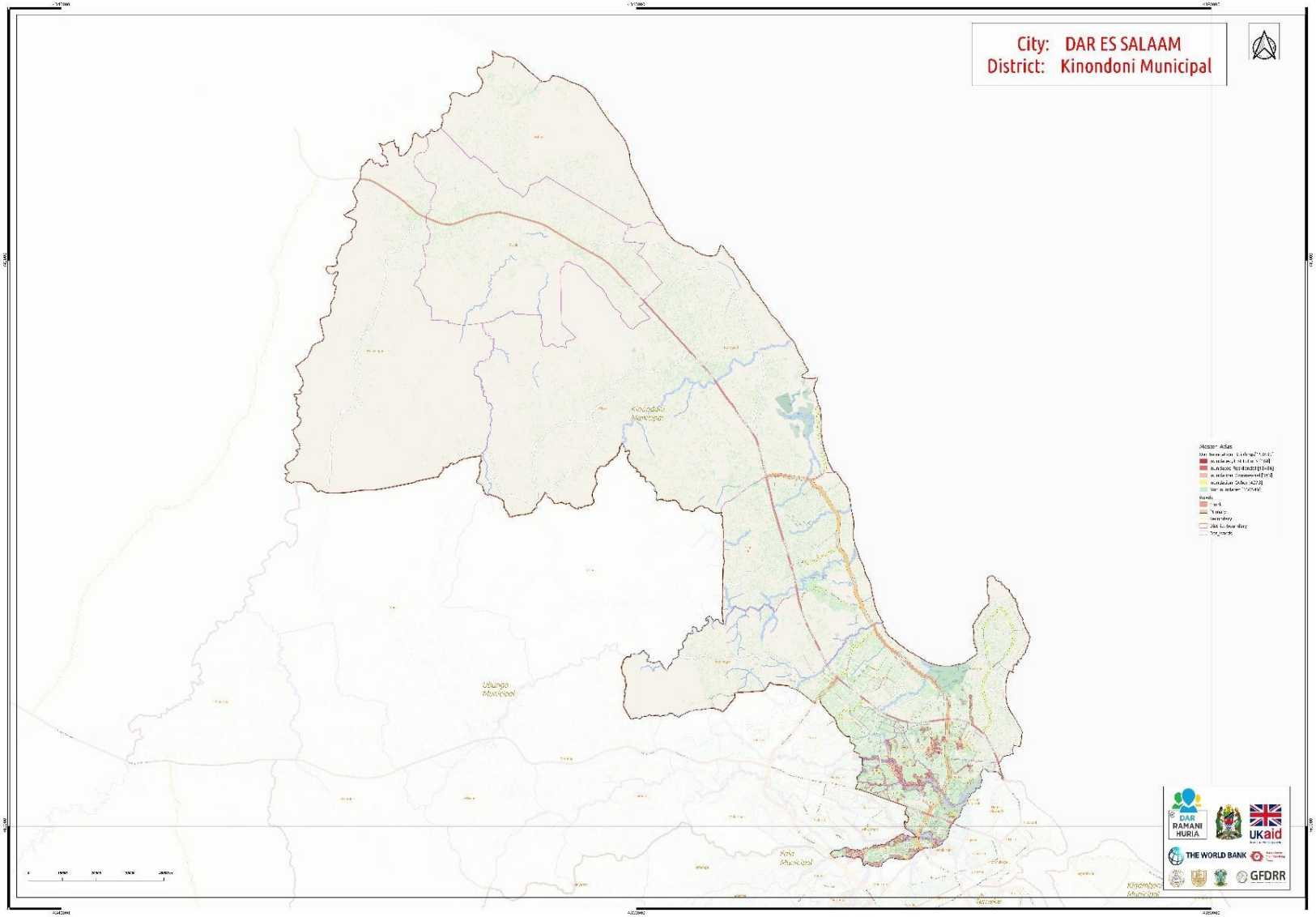
	Agency	Name	Position	Email address	Contact number
20		ACP Evance Mwijage	Commanding Officer Police Marine	co.marine@tpf.go.tz evancemwijage@gmail.com	0658481002
21		SP Athumani Boge	Officer Commanding 999		0766595960
22		SP. Desdery K. Rugimbana	Regional Traffic Officer -Kinondoni	desderyrugimbana@yahoo.com	0784240486
23		A/INSP. Abdiel W. Shami	Police 999	shamiabdiel14@gmail.com	0716729729
25		Dr. Emanuel N. Kombe	Emergency Coordinator - Kinondoni	kombenice@gmail.com	0754841820
26		Dr. Felister Kimolo	Emergency Coordinator - Ubungo	fellykimolo@gmail.com	0716204204
27		Dr. Evance Polin Molinga	Emergency Coordinator - Temeke	evanpolin@gmail.com	0714110142
28		Dr. Consolata Mbatina	Emergency Coordinator - Amana	consol2007@yahoo.com	0715859537
29	Private Sector, NGO	Mr. Joseph Sulemani	Private Ambulance Coordination	ems@tmhstz.com	0677066444
30		Mr Adam Ismail Adam	Rescue expert	adam@adams.co.tz	0784604111
31	Local Authority	Ms. Pendo Fred Mwaisaka	Municipal Disaster Coordinator - Kinondoni	pendofredmwaisaka@gmail.com	0713493246
32		Ms. Magdalena Msaky	Municipal Disaster Coordinator - Ilala	magemsaki@yahoo.com	0754887000
33		Ms. Juliana Kibonde	Municipal Disaster Coordinator -Ubungo	jkibonde@gmail.com	0713831972
34		Ms. Sweetbertha Paschal	Municipal Disaster Coordinator - Temeke	sweetcastor1999@yahoo.com	0784946958
35		Ms. Suzan Philemon Swai	Municipal Disaster Coordinator- Kigamboni	susankoku@gmail.com	0622038202
36	Utility Companies	Mr. Benedicto Julius	Regional Manager, TARURA	benedictojulius24@yahoo.com	0715434923
37		Mr. Nebu Kyando	Operation Manager, DART	nebu.kyando@dart.go.tz	0713616643
38		Eng. Pascal R. Luhwavi	Public Health and Safety Office - TANESCO	pascal.luhwavi@tanesco.co.tz	0768505099
39		Engr. Joseph Kishimbo	Manager, TANROADS	kishimbojay@hotmail.com	0766613167

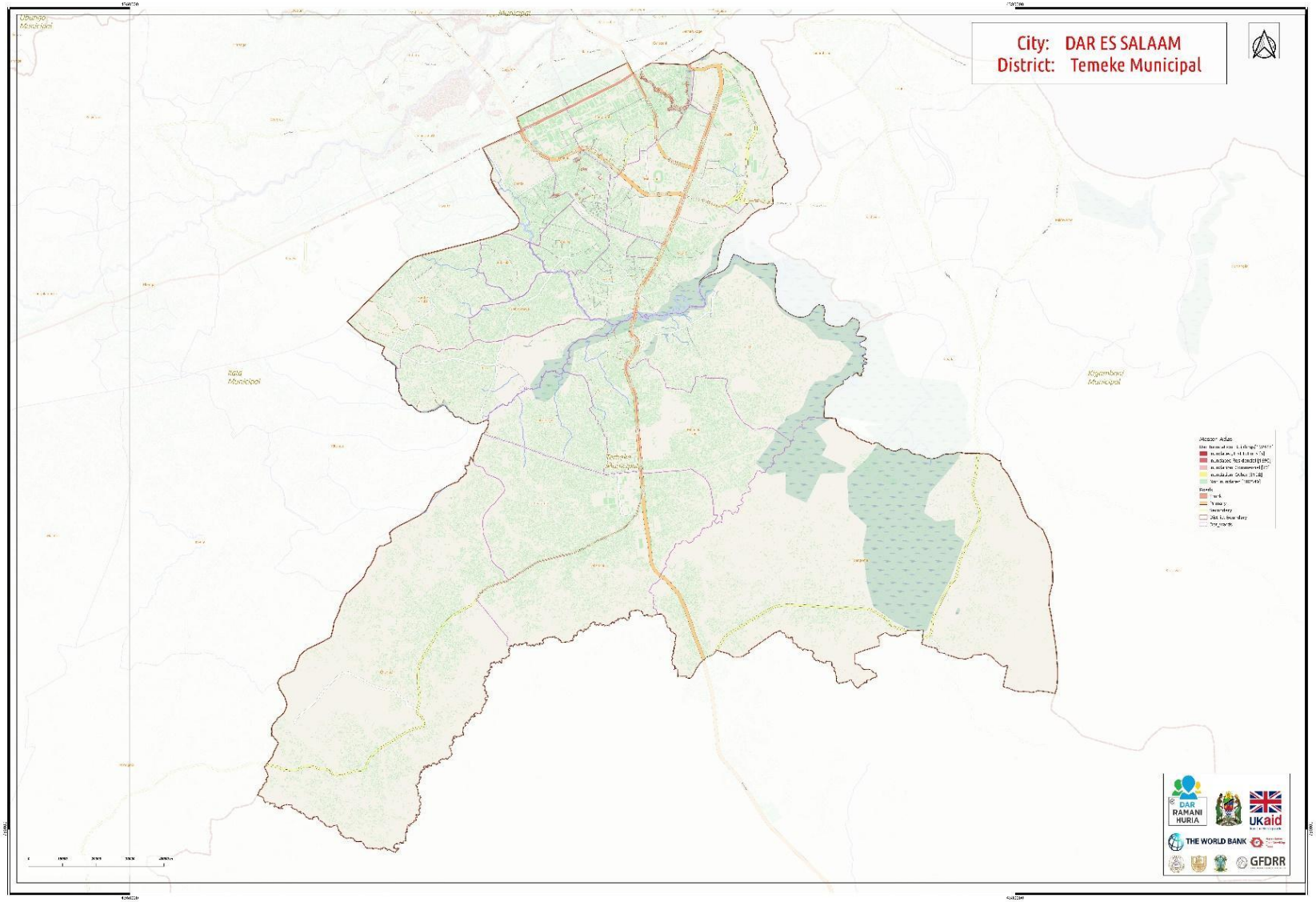
	Agency	Name	Position	Email address	Contact number
40	TMA	Mr. Elias Lipiki	Meteorologist	elias.lipiki@meteo.go.tz	0765908951
41	Emergency Operation Center (EOC)	Mr. A/INSP Longino Rwegoshora	Communication Office/Information and Communications Technology	longinokamugisha1@gmail.com	0783026695
42		Ms. Christina Agaton Lyabonga	Emergency Operations Center Officer	christinalyabonga@gmail.com	0655276247
43		Ms. Jane Urio	Emergency Operations Center Officer	janeurio@gmail.com	0713429660
44		Ms. Adrophina M. Ndyeikiza	Information Officer	adrophinandyeikiza@gmail.com	0717648049
45		Ms, Eva Macha	Emergency Operation Center	evamacha@gmail.com	0714187202
46		CPL Thomson Mrema	Communication Office/Information and Communications Technology	thomsonmrema@gmail.com	0718601138

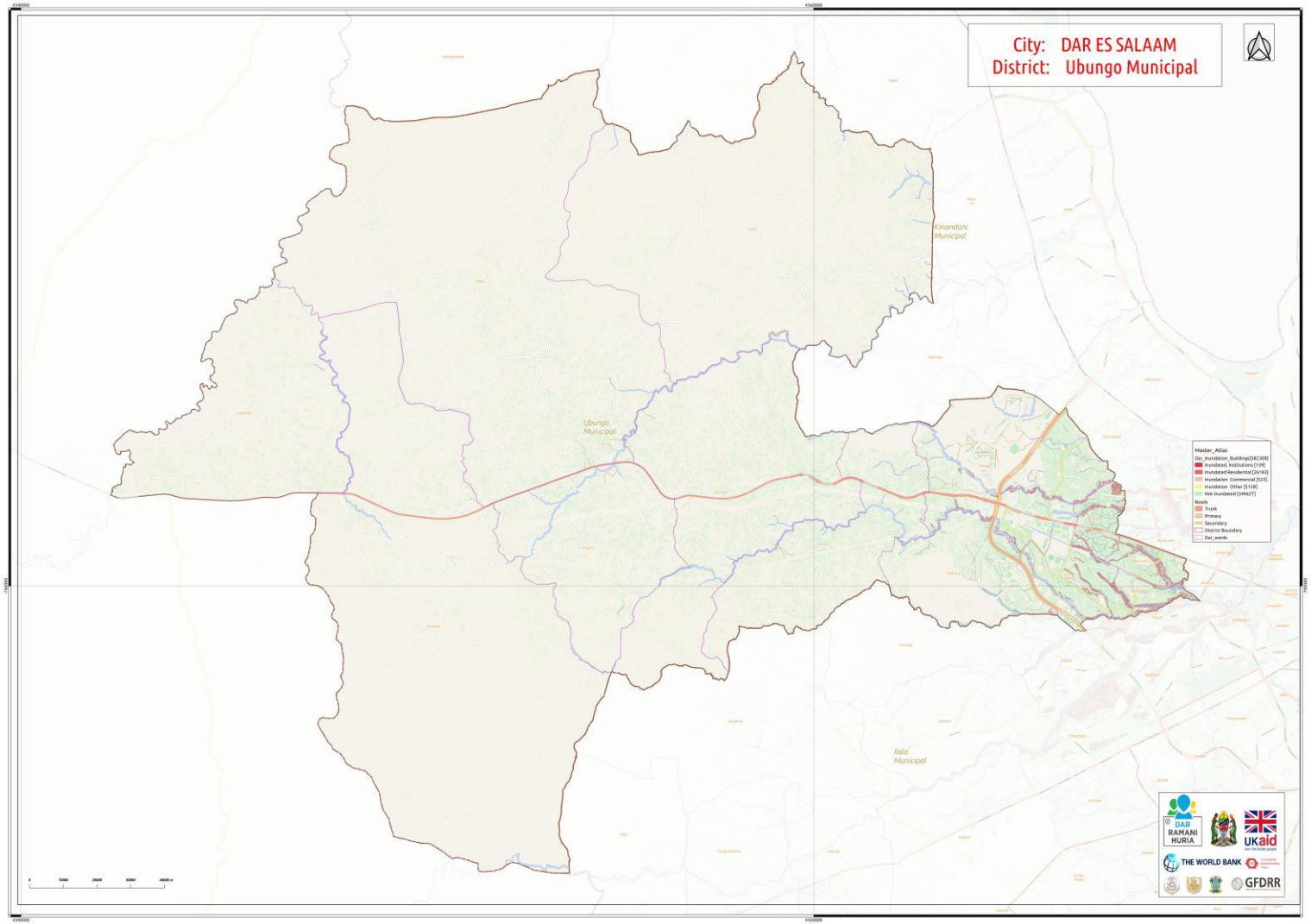
5.2. Annex 2: Inundation Maps of Dar es Salaam




City: DAR ES SALAAM
District: Kigamboni Municipal
Ilala Municipal
Temeke Municipal
Kigamboni Municipal
DAR RAMANI HURIA
UKaid
THE WORLD BANK
GFDRR


City: DAR ES SALAAM
District: Kinondoni Municipal
Kinondoni Municipal
Ubungo Municipal
Kigamboni Municipal
DAR RAMANI HURIA
UKaid
THE WORLD BANK
GFDRR


City: DAR ES SALAAM
District: Temeke Municipal
Ubungo Municipal
Ilala Municipal
Kigamboni Municipal
DAR RAMANI HURIA
UKaid
THE WORLD BANK
GFDRR


City: DAR ES SALAAM
District: Ubungo Municipal
Kinondoni Municipal
Ubungo Municipal
Ilala Municipal
Master_Atlas
Dar_Inundation_Buildings[182308]
Inundated_Institutions [139]
Inundated Residential [26183]
Inundation_Commercial [323]
Inundation_Other [1128]
Not Inundated [349427]
Roads
Trunk
Primary
Secondary
District Boundary
Dar_wards
DAR RAMANI HURIA
UKaid
THE WORLD BANK
GFDRR

SUPPORTED BY: