REPUBLIC OF RWANDA

MINISTRY IN CHARGE OF EMERERGENCY MANAGEMENT(MINEMA)

NATIONAL CONTINGENCY PLAN FOR STORMS

October 2018

FOREWORD

Storms (Heavy rains, winds, thunder, hailstones) resulting to hydro metrological disasters, are the most devastating hazards in Rwanda in terms of losses, damages and frequency. This is due mainly on the highest vulnerability of the population and the insufficiency of coping capabilities.

All districts are affected from storms every year and it is the reason why prevention and mitigation measures are regularly taken and reviewed to tackle this emerging threat linked also with the effects of the climate change and the pressure on the environment and the ecosystem.

The mitigation initiatives include planning to relocate population from high risk zone, initiation of effective adaptation methods especially in high slopes areas, mapping the physical exposure and vulnerability, protecting population on lightning risks etc.

However, we also know that despite the above mentioned initiatives, the global climate change and the economic pressure trend is increasing for the benefit of economic growth and social welfare. It will be not easy to mitigate totally all risks and to prevent new ones. It is in that spirit that our country must be always ready to minimize the suffering of the population after a potential disaster.

This contingency plans comes in that perspective; to document the storms as it appears now, to analyze through modeling new trends and to set preparedness and readiness measures against anything that can happen. Successful implementation of this Storms Contingency Plan will certainly contribute to the improvement of early warning systems for storms detection, reporting mechanisms, and cross-sector collaboration, all aimed at improving response to all kinds of emergencies that may arise.

I therefore call upon all government departments, development partners, districts and sectors to support this Storms Contingency Plan and its resulting response plan (s) to ensure successful implementation.

KAMAYIRESE Germaine
Minister in Charge of Emergency Management

ACKNOWLEDGMENT

This National contingency plan for storms was made for the Republic of Rwanda, with technical support of the members of the National Platform for disaster Management.

I wish to acknowledge and thank the individuals, who were very resourceful during the process of compiling this plan. In particular I thank resource persons at the Ministry in charge of Emergency Management namely; NSENGIYUMVA Jean Baptiste, BUDEDERI Eric and I thank Mr. UWIZEYE Emmanuel from the Ministry of Environment Dr. DUSHIME Dyrckx from the Rwanda Red Cross. Thanks go to the team which have reviewed and updated this National Contingency Plan for Storms namely, BUDEDERI Eric, NTEZIRYAYO Christophe from MINALOC, Capt. KANISA Innocent from RDF, NYIRANTEZIRYAYO Esperance from Meteo-Rwanda, HODARI Jean from NYABIHU District, and NZIRANZIZA Martin from RUSIZI District for their efforts and inputs when reviewing and updating the contingency plan for storms.

I thank also the members of the national platform for disaster management for their proofreading and technical validation

I however reiterate the need of collaboration of all stakeholders as their support will also be needed in reviewing and adapting this plan when necessary but more importantly to implement it in order to mitigate drought risk, prepare and respond to and recover from effects of storms if it occurs.

Sincerely,

HABINSHUTI Philippe
Director of Response and Recovery Unit
Ministry in Charge of Emergency Management

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I. INTRODUCTION

Worldwide, the societal impacts of storms are measured by loss of lives and economic damages. Humans tend to categorize storms according to what we see as the weather's most damaging or impressive aspect. Storms refer to thunderstorms, hailstorms, windstorms, etc.

The storms are generally due to a consequence of solar heating, global warming, climate change and green house gases emission. We know that the global climate is currently changing. The last decade of the 20th Century and the beginning of the 21st have been the warmest period in the entire global instrumental temperature record, starting in the mid-19th century. Global warming refers to climate change that causes an increase in the average temperature of the lower atmosphere. Global warming can have many different causes, but it is most commonly associated with human interference, specifically the release of excessive amounts of greenhouse gases.

Rwanda is a country which is exposed to several extreme storms such as thunderstorms, hailstorms, windstorms, lighting which has caused the loss of lives and property as well as injuries in our population. Their frequency, the seasons during which they occur and the areas usually threatened can be established with some precision but their occurrence and trajectory cannot, until they are already developing.

The storm is a very dangerous phenomenon that can cause several human and socio-economic damages. It is, then, important to know the risk, types of storms and to prepare contingency plan in the case a storm occur. It is then the responsibility of the government as well as the individual to get prepared, to aid in recovery and to reduce the damage these storms create.

The National Contingency Plan for storms contains information that guide people, the government and other stakeholders to properly respond in case of disaster occurrence or any other types of emergencies.

The preventive and protective measures are decisive in such cases and the close collaboration with meteorological institution is necessary to enable the risks to be predicted and the political authorities, firms and population to be warned and advised accordingly.

II. PURPOSE

This contingency plan is aimed to:

- Establish necessary systems and preparing for responding to storms and related threats in different districts of Rwanda in order to save lives and property, avoid disruption of economic activity and damages to environment and to ensure the continuity and sustainable development;
- Organize effective preparedness for response and coordination mechanisms of the activities to be carried out to manage storm crisis;
- Determine the level of intervention and actions to be carried out;
- Identify the roles and responsibilities of the involved stakeholders.
- Strategies to improve institutional capabilities

III. CONCEPTS AND TERMINOLOGIES

3.1. Storm

A storm is any disturbed state of an environment or astronomical body's atmosphere especially affecting its surface, and strongly implying severe weather. It may be marked by significant disruptions to normal conditions such as strong wind, hail, thunder and lightning (a thunderstorm), heavy precipitation (snowstorm, rainstorm), heavy freezing rain (ice storm), strong winds (tropical cyclone, windstorm), or wind transporting some substance through the atmosphere as in a dust storm, blizzard, sandstorm, etc.

3.2. Thunderstorm

Thunderstorm or severe storm is the result of convection and condensation in the lower atmosphere and the accompanying formation of a cumulonimbus cloud. A severe storm usually comes along with high winds, heavy precipitation (rain, sleet, and hail), thunder and lightning.

3.3. Hailstorm

Hailstorm is a type of storm that is characterized by hail as the dominant part of its precipitation. The size of the hailstones can vary between pea size (6mm) and softball size (112mm) and therefore cause considerable damage.

3.4. Lightning

Lighting is an atmospheric discharge of electricity, which typically occurs during thunderstorms, and sometimes during volcanic eruptions or dust storms.

3.5. Wind

The wind is defined as the horizontal movement of air caused by the force when there is a change in atmospheric pressure and the winds normally blow from the lower pressure to higher pressure.

3.6. Windstorm

Windstorm refers to strong winds caused by regional atmospheric phenomena which are typical for a certain area. If the winds are sufficiently fast, they are identified as windstorms and are often labeled as damaging straight-line winds.

3.7. Flood

Flood is a natural event that is caused by a combination of heavy rainfall causing river/oceans to overflow their banks and can have far effects on people and the environment.

3.8. Landslide

Landslide is defined as downward and outward for mass movement of slope forming materials composed of rocks, soils, artificial fills or combination of all these materials along surfaces of separation by falling, sliding and flowing, either slowly or quickly from one place to another.

3.9. Heavy rain

Heavy rain is liquid precipitation, as opposed to non-liquid kinds of precipitation such as snow, hail and sleet; Rain requires the presence of a thick layer of the atmosphere to have temperatures above

the melting point of water near and above the earth's surface. On earth, it is the condensation of atmospheric water vapor into drops of water heavy enough to fall, often making it to the surface.

3.10. Disaster

Disaster is a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of affected to cope on its own resources (UNISDR 2001).

3.11. Disaster management

Disaster management is a way of dealing with natural hazards. In many parts of the world, neither the population nor the authorities choose to take the danger of natural hazards seriously, for various reasons namely socio-economic, political, cultural, religious, etc. To effectively mitigate disasters, a complete strategy for disaster management is required, which is also referred to as the disaster management cycle. Disaster management consists of two phases that take place before a disaster occurs, disaster prevention and disaster preparedness (both phases together are also referred to as disaster mitigation), and three phases after the occurrence of a disaster: disaster relief, rehabilitation and reconstruction.

3.12. Storms hazard

A storm is basically a natural disaster which is caused by any change in the atmosphere, whether it is a change in pressure, temperature or the water level. It usually involves heavy rains strong winds which can cause a lot of destruction. Storms are formed when a system of low pressure air is surrounded by a system of high pressure air. These two air systems, at different pressures create very high speed winds and form storm clouds that can cause heavy rains.

Type of storms

- **Storms likely to happen in Rwanda include:**

- **Windstorm**: is a storm where strong and powerful winds blow. This storm may or may not include rain and can be very dangerous as the strong wind can do a lot of damage because it

may carry dust and stones with it. If the windstorm is very violent and is accompanied by hailstones and rain then it is called tempest but if it is a moderate short lived windstorm then it is known as squall.

- **Hailstorm:** is a severe kind storm in which heavy and strong winds blow accompanied by hail stones and ice pellets. These ice pellets can vary form 0.2-0.5cm in diameter. These hailstones that fly along with the fast moving wind can be dangerous and cause a lot of destruction.
- **Thunderstorm:** is a type of storm that generates lightning and the attendant thunder. It is normally accompanied by heavy precipitation. Thunderstorms occur throughout the world. With the highest frequency in the tropical rain forest regions where there are conditions of high humidity and temperature along with atmospheric instability.

IV. RISK IDENTIFICATION FOR STORMS

4.1. Risk overview

Rwanda is prone to a variety of natural hazards including thunderstorms, windstorms and rainstorm. Thunderstorms are often accompanied by high winds, hail, lightning, heavy rain. Thunderstorms are also described as one or more sudden electrical discharges, manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder). Thunderstorms are associated with convective clouds and are most often, but not necessarily, accompanied by precipitation at the ground. Thunderstorms has become one of the most alarming hazards to affect Rwanda in recent years as these have been causing deaths and injuries to Rwandan population. Former MIDIMAR Disaster Data from 2011 to 2018 revealed a total of 244 deaths and 434 injuries in different Districts across the country. Some Districts also reported damages to houses and loss of livelihoods specifically to plantations and livestock as follow:

Houses destroyed/damaged 21,049; Crop lands affected (ha) were 5,754.04ha, deaths of livestock were 250 and then, some infrastructure including Classrooms 248. Due to the direct impacts of lightning to lives of people causing casualties in upward trend over the past recent years, this has raised serious concerns and attention from both the government and the public.

Windstorms have been of the major hazards that caused several damages in some areas of Rwanda.

Former MIDIMAR assessment reports (2018) state that the windstorms associated with heavy rain have destroyed enormous houses, schools, churches, health facilities, buildings, vehicles, crops, other infrastructures like transmission lines and down power of electrical wires supports, bridges, roads, etc.

According to the National Risk Atlas of Rwanda (2015), Disaster communication System (DCS) and MINEMA Assessment reports (2018) storms events losses hereunder have been recorded in the whole country.

- Death: 244
- Injured: 434
- Houses destroyed/damaged: 21,049
- Crop lands affected (ha): 5,754.04
- Livestock: 250
- Classrooms: 248
- Health Centers: 4
- Roads: 23
- Churches: 44
- Bridges: 35
- Administration offices: 24
- Water supply: 3
- Transmission lines: 83

4.2. Preparedness mechanisms for storms

Preparedness mechanisms to the storms likely to happen in Rwanda are not an easy task to perform individually and that is why it will incorporate the following measures:

- Incorporate many institutions from national level up to local level, stakeholders, community and household engagement,
- Capacities development and knowledge of professionals, communities and individuals to anticipate imminent storms.
- To know the risks specific to the community and the region for better preparedness.
- Have buildings or infrastructure which can resist to disaster effects with standard respecting construction code and regulations,
- Have in place an education curriculum on disaster management and risk reduction to be taught into schools,

- Conducting regular trainings on the disaster management and its related risks,
- Sharing information at the public places, using communication channels (Radio, TVs, Newspapers, and Social Media etc) to make people aware of what could probably happen for more readiness.
- Tree planting surrounding the dwellers and other infrastructure to mitigate disaster effects

V. DEVELOPMENT OF SCENARIO AND ASSUMPTIONS

It is a probability of an event to occur in a certain moment. The scenario is provided for planning purposes only and is not intended to be representative of what may or may not happen in a real scene of storms which is impossible to predict with assurance. Storms impact and its aftershocks are dependent on a variety of factors. A scenario of rainstorms has been taken as guiding scene in this plan.

Table 1: Scenarios for windstorms

Storms (Rainstorms, Windstorms, Hailstorms, Thunderstorms)

Emergency Effects of storms	Most Probable	Probable/Moderate	Less probable
Rainstorm	From March to June 2018, Rwanda experienced cases of rainstorms which damaged and destroyed family buildings and impacted people's lives as follow: • Dead people: 150 • Injured: 102 • Destroyed houses:1,000 • Damaged crops:2,000ha • Bridges: 38 • Killed livestocks:1,000 • School rooms: 29 • Health centers: 18 **Impacts:** 5,000 people need immediate and temporarily housing and more than 1,305 students need to return-back to school as well. 18health centers need to be rehabilitated as soon as possible, 29 classrooms also need to be reconstructed and then 38 bridges need a partial repair, 150 dead people need to be buried, 102 injured people need counseling because of some cases of trauma.	In the period of two weeks from 4th-18th September 2018, in Rusizi, Nyamasheke, Karongi, and Rutsiro Districts of the western province rainstorms including hailstorms, thunderstorms and related hazards affected more than • Dead people: 400 • Injured people: 4,400 • Destroyed houses: 20,000 • Crops: 16,000ha • Bridges: 50 • Live stocks: 2,000 • School room: 200 • Health facilities: 90	From April to June 2018, in Rulindo and Gicumbi districts a heavy rainstorms with strong winds affected people's home and properties as follow: • Dead people: 1,000 • Injured people: 10,400 • Destroyed houses: 25,000 • Crops: 23,000ha • Bridges: 200 • Live stocks: 4,000 • School room: 300 • Health facilities: 90 • • • households and more than 18,340people were seriously affected by storms effects, 2,600 people

Windstorms	The effects of windstorms impacted family buildings and properties as follow: • Damaged houses: 13,000 • Traumatized: 20 • Injured: 70 • Crops: 237ha • Admin offices: 69 • Health centres: 28 • School rooms: 44 • Livestock: 31 • Churches: 20	2,300 buildings of the community (family houses, health facilities, schools markets, etc.) during the event, 108 people passed away and 400 got injured, 348 people were traumatized due to abnormal situation seen. 1,600	among them were died and 8,000 people got injured, 7,740 people immigrated into neighboring districts including Musanze, Gakenke and Nyarugenge districts, 6,000ha of crops immediately damaged
Thunderstorms/Lightning	The effects of thunderstorms impacted family buildings and properties as follow: • Dead people: 200 • Injured people: 400 • Traumatized: 520 • Killed livestocks:1,500 • School rooms: 48 • Health centers: 18 • Electrical poles: 23 • Transmission lines: 25	ha of crops damaged in Rusizi district and 567ha of crops damaged in Rutsiro district and then 345ha of crops damaged in Karongi district, 8 health facilities damaged in Rusizi, 4 in Karongi, 6 in Rutsiro district. 42 school rooms were destroyed in Nyamasheke, Karongi, and Rutsiro districts. 11,500 people need immediate and temporarily housing and more than 2,340 students need to return-back to school as well. 348 traumatized people need to receive primary health and treatment.	44 electrical poles damaged, 89 petrol stations damaged, 12 health centres destroyed and there is no health services in place, roads are not accessible from district to another.
Hailstorms	• Dead people: 2 • Injured: 8 • Damages of houses: 667 • Crops: 568 ha • Livestock: 21 • School rooms: 12 • Health centres: 6		
Location for sensitive areas	Western province and some of districts in south, north,	Countrywide (All provinces including city	Northern province (Rulindo, Gakenke,

	east and kigali-city (Ngororero, Karongi, Rutsiro, Rusizi, Nyamasheke, Rubavu, Nyabihu, Kamonyi, Ruhango, Huye, Nyana, Bugesera, Kirehe, Ngoma, Burera and Musanze))	of kigali)	Burera, Musanze and Gicumbi

5.1. Preparedness and Response Coordination

The Ministry in charge of emergency Management holds the responsibility to coordinate all activities related to the preparedness and response to the disasters that may be caused by storms. MINEMA will work closely with other concerned stakeholders including the co-lead according to the disaster that has occurred. Generally, MINEMA should work closely with The Rwanda Defence Forces, the Rwanda National Police, the Rwanda Red Cross, and the Ministries of agriculture, infrastructure, local government, health and natural resources, member of NPDM and others.

All institutions will work with the districts through MINALOC, with timely response on 24/7 basis. The Rwanda Meteorological Agency (Meteo Rwanda) should keep providing information and warnings susceptible to have the incidence on preparedness and response activities.

The other members of the NPDM (UN agencies, NGOs, private sector and civil society) will also contribute to the implementation of the national contingency plan for storms.

5.2. Emergency management and response operations

5.2.1. Objectives

In line with the National Disaster Risk Management Plan and the National Risk Atlas, the humanitarian actors will support the Government to put in place a timely, consistent and coordinated response to the emergency in order to save lives and properties in order to respond to the humanitarian needs of the affected population in case of strong storms.

5.2.2. Response Strategies

To achieve this, the following response strategies will be taken into account:

- The Government will work through a sector-based approach, as defined in the Rwanda National Disaster Management Plan,
- Engage all Humanitarian organizations in direct implementation in response to the "Humanitarian imperative" based on the frameworks set down by Government, MINEMA, JIMC, NPDM, DIDIMACs, SEDIMACs,
- All humanitarian actors must respond in accordance with recognized international standards,
- The emergency response must consider the participation and involvement of the affected communities' leaders and the opinions of the beneficiaries at the earliest opportunity.
- The Government of Rwanda has to monitor and put in place mechanisms to contain the effects of storms and therefore inform the international community accordingly,
- Responders must comply with the existing rules and regulations in line with disaster management,
- Speed up with response activities including relief assistance timely

5.2.3. Guiding Principles for response

Humanitarian action is built on the basic principles of humanity, neutrality, and impartiality. Besides, humanitarian organizations must completely embrace fully the principles of accountability and 'do no harm'.

The Guiding Principles and Code of Conduct contained in the National Disaster Management Policy will be rigorously referred to by all stakeholders.

VI. COORDINATION OF STORMS RESPONSE ACTIVITIES

The response coordination will be made through disaster management committees with respect of the level of decision to be taken. The concerned DM committees are the National Disaster Management Executive Committee (NADIMEC) at high level, the National Disaster Management Technical Committee and the District Disaster Management committee at implementation level.

The two committees at implementation level involve the non-government humanitarian actors to constitute the National Platform for disaster management and the emergency operation committee and these committees have to intervene in all matters related to emergency management.

The sequence of decision making and activities will be referring to the NDMP and the National Strategy for Response and Recovery.

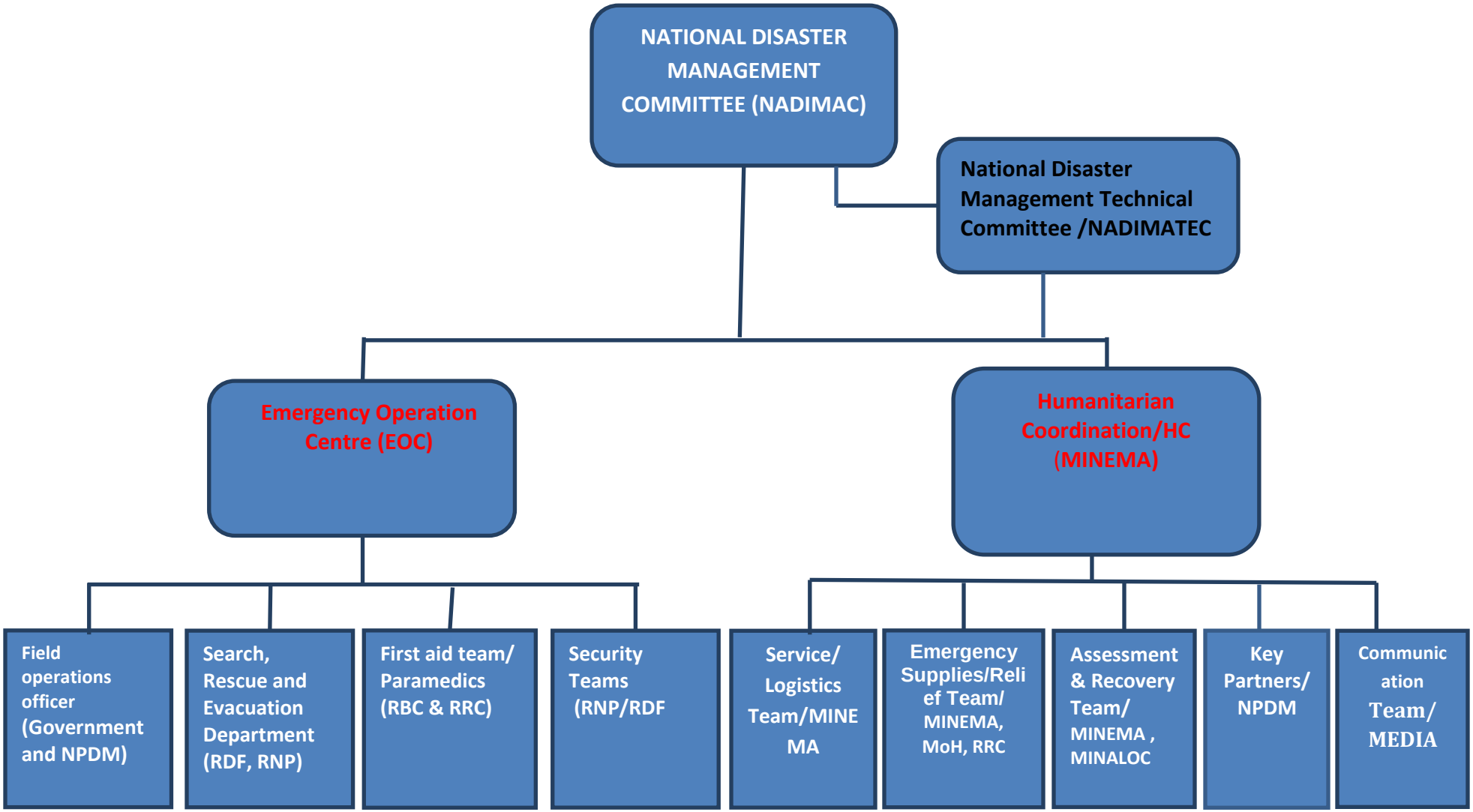
6.1. Decision Making Process

If the emergency is confirmed, the alerts will be triggered and the NCPS will be immediately activated. This will be enabled by the DIDIMAC but the final decision shall be taken by the NDMEC. The following actions will be taken during the activation of the NCPS

The Chairperson of the DIDIMAC will convene all DIDIMAC members and identify other resource persons in the staff of humanitarian operating in the area according to their specific skills, interests and capabilities. An emergency response team will then be put in place.

- The emergency response team members will coordinate required clusters/sectors until the end of the operations (Emergency Shelter, Logistics, WASH, Health, Protection, NFI, Food and nutrition, Security ...)
- The DDMC chairperson will report to the NDMEC on the situation progress, humanitarian access and other issues related to security for them to take appropriate decisions,
- The MINEMA will work closely with the DIDIMAC to perform the partnership between the district teams and NPDRR teams,
- To set an Emergency Operations Committee (EOC) that will gather the NPDRR responders and the DIDIMAC members,
- The sector plans will be activated by the NADIMEC and special focal points appointed for its implementation.

Figure 1: **Storms Operational management Structure**



6.2. Management of Operations

6.2.1. Preparedness plan

Once there is a warning for a storm, the EOC will take all necessary actions to enhance preparedness measures including setting an evacuation plan, resource inventory, hosting sites determination, increasing public awareness, search and rescue and others.

6.2.2. Operational Response

Once the confirmation of storms is issued, the NCPS should be activated by MINEMA and the sector plans be activated by NADIMEC. The pre assessment teams should ensure the evaluation of elements at risk and needs determination and start to implement the evacuation plan.

Members of the EOC should start to provide assistance to the affected population according to the National Response and Recovery Strategy. There is one response framework, non-government humanitarian actors' work with the government responders through the NPDM.

6.2.3. Communication and Information Sharing

Once the NCPS activated, the EOC is responsible to collect, verify and compile all the information regarding the emergency. Collection and validation of information provide a general assessment of the emergency and will help to identify response and recovery needs ahead of time and determine actions that require external experts. The rapporteur appointed by EOC will facilitate the exchange and collection of information among key partners and ensure the liaison with the NADIMAC and with the media.

The information management procedures are as follow:

a. All information must be transmitted by the Liaison officer appointed by the EOC who is also responsible for the collection and consolidation of data and transmission to all parties concerned.
b. Any information is validated by the Head of EOC before transmission and information sharing
c. The media will be managed and helped by the EOC in order to minimize the risk for them to interfere with response activities.

6.2.4. Roles and Responsibilities for responders

The MINEMA holds the responsibility to harmonize the work of humanitarian actors especially for coordination of assistance during an emergency and information sharing.

- The Contingency plan for storms is activated by the MINEMA based on confirmation of imminent storms to operationalize cross-sectoral rapid assessment,
- Tto propose the emergency response observed after assessments and manage information with the support of the international humanitarian community.
- Following the chart above, coordination will be done by the Ministry in charge of Emergency Management (MINEMA), which has the primary responsibility of the response to crises and disasters and Emergencies. Specifically, the disaster response unit will handle the response in partnership with the Rwanda National Police and the Rwanda Red Cross.

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APPENDIX 1:

PREVENTIVE AND PROTECTIVE MEASURES DURING STORMS EFFECTS

1. Before a storm

-Conform to the planning regulations and to building standards and norms.

-Seek information on the risk of storms in the area where you are staying and on the established protective and rescue measures.

- Prepare and keep at hand an emergency survival kit for all the family which includes: emergency cooking equipment, drinking water, first-aid kit, emergency spare clothing, lights, flashlights, and pocket torches in working order, food stocks, know how and where to turn off your electricity, gas and water and keep necessary tools readily accessible.

- Reduce dead branches from neighboring trees and if need be cut down weak trees to prevent them from falling on the building. Secure light and weak structures, especially mobile homes or caravans or shelters that can be dismantled.

- Designate a meeting point for all family members in case the storm occurs whilst they are at school, work, etc., and therefore not together, or in case your home is destroyed.

2. When the storm is imminent

- Close all doors and windows and reinforce shutters.

- Move inside all furniture and other objects likely to be swept away by the wind or water.

- Avoid leaving the house or shelter and do not send the children to school.

- Do not use boats or motor vehicles. If in mid-journey, make your way to the nearest shelter as quickly as possible.

-Issue storms warnings through website, radio, television, etc.

3. During the storm

- Keep calm and avoid panic.

- Assist neighbors and persons in difficulty, such as the wounded, children, handicapped and the elderly.

- Assemble everyone in the emergency shelter specially equipped for this situation, and keep a supply of drinking water.

- Follow the radio, television, and website but do not use the telephone without good reason, as this overloads the system.

- Do not leave the building, keep away from windows and display cases. Do not use a vehicle without permission from the rescue squads.

- Follow the instructions given by the authorities and by the intervening bodies, especially as regards the evacuation of people and livestock. If it is necessary to evacuate, cut off the gas, water and electricity supplies.

- Lock the door.

- If caught by the storm whilst outside or in a vehicle, leave the vehicle and seek refuge in the nearest building.

-During a thunderstorm protect yourself from lightning by keeping away from metal objects, switching off the electricity supply, telephone and television. Avoid standing up in an elevated area or sheltering under a tree.

3. After a storm

- Keep calm and do not panic.

- Stay at home or inside the building in which you have sheltered. Do not use vehicles because of traffic problems and danger from damaged buildings and roads.

- follow the radio, television, website, and authorities' instructions. Only use the telephone in an emergency.

- Check to see if there are people nearby which are wounded or in difficulty and assist them.

- Do not go near, touch or use damaged electrical installations, cables and wires and alert the relevant authorities to the damage. The same applies to ruptured water or gas mains, sewers, hydrocarbon pipelines and reservoirs holding chemical substances.

- Drink water only after having boiled it or used chlorine tablets to purify it.

In case of long electricity cuts regularly check the contents of refrigerating units and dispose of ruined foodstuffs.

- Collaborate, if required, with the rescue and assistance services and help with vital priority repairs and rehabilitation work.

During a Thunderstorm

- Remain indoors and away from windows during thunderstorms.
- Do not be or stand next to - tallest object in the area
- Do not stand on hilltops or open beaches
- Do not stand near wire fences, metal pipes, railroad tracks, or other metal objects that could conduct electricity
- Do not stand in or near water
- Do not seek shelter in small sheds or barns in open areas
- If in closed vehicle, roll up windows and remain inside
- If in vehicle, do not lean against doors or play radio
- If lightning is occurring and a sturdy shelter is not available, get inside a hard top automobile and keep the windows up.
- Avoid touching any metal
- Utility lines and metal pipes can conduct electricity. Unplug appliances not necessary for obtaining weather information.
- Avoid using the telephone or any electrical appliances.
- Turn off air conditioners. Power surges from lightning can cause serious damage.
- If you are in the woods, take shelter under the shorter trees
- Find a low spot away from trees, fences, and poles. Make sure the place you pick is not subject to flooding.

APPENDIX 2:

Strong wind hazard map of five year return period Strong wind hazard map of 10 year

The storms affect Rwanda in different ways with different impacts. We have to note here that 2.8 millions of Rwandan population is prone to storms; heavy rains with wind and lightning, (MINEMA, 2015). The maps below highlights areas mostly affected by windstorms nationwide over different return periods, and this will help to determine the coping mechanisms in order to minimize the shocks.