



Republic of Mauritius

National Disaster  
Risk Reduction  
and Management  
**Strategic Framework**  
2020-2030

02 March 2021

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## List of Abbreviations and Acronyms

AFD: *Agence Française de Développement*  
CCA: Climate Change Adaptation  
DRRM: Disaster Risk Reduction and Management  
EEZ: Exclusive Economic Zone  
ER2C: Enhancing Resilience to Climate Change  
GDP: Gross Domestic Product  
HDI: Human Development Index  
LDRRMC: Local Disaster Risk Reduction and Management Committee  
LEOC: Local Emergency Operations Command  
MMS: Mauritius Meteorological Services  
Natech: Natural-technological  
NCC: National Crisis Committee  
NDRRM Act: National Disaster Risk Reduction and Management Act 2016  
NDRRMC: National Disaster Risk Reduction and Management Centre  
NEOC: National Emergency Operations Command  
PIROI: *Plate-forme d'intervention Régionale de l'Océan Indien*  
PoA: Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa  
RCC: Rodrigues Crisis Committee  
RDRRM Council: Rodrigues Disaster Risk Reduction and Management Council  
REOC: Rodrigues Emergency Operations Command  
SADC: Southern African Development Community  
SIDS: Small Island Developing State(s)  
UNDRR: United Nations Office for Disaster Risk Reduction  
WHO: World Health Organization  
WMO: World Meteorological Organization

# Executive Summary

This National Disaster Risk Reduction and Management Strategic Framework (National Strategic Framework), together with the National Disaster Risk Reduction and Management Policy and National Disaster Risk Reduction and Management Action Plan, guide the Republic of Mauritius' approach to disaster risk reduction and management for the next 10 years to 2030. This National Strategic Framework is for use by all Ministries and Departments, at national and local levels, while also engaging communities, civil society, development partners, and the private sector in disaster risk reduction and management efforts. It incorporates generally accepted good practices in disaster risk management, including attention to gender, age, health and disability status, as well as an ecosystem-based approach to risk management to support a sustainable future.

This National Strategic Framework is aligned with the Sendai Framework for Disaster Risk Reduction 2015-2030 and provides a pathway to achieve internationally agreed priorities for action and targets for disaster risk reduction by 2030. It incorporates the Republic's obligations and commitments under the African Union Programme of Action for the Sendai Framework, the Sustainable Development Goals, and the Paris Climate Agreement.

This National Strategic Framework is tailored to the unique context of the Republic of Mauritius. As a Small Island Developing State (SIDS), the Republic of Mauritius faces a range of hazards, including cyclones, storm and tidal surges, torrential rains, floods and flash floods, landslides, tsunami and technological hazards, amongst others. All these hazards can lead to disasters if not properly managed. The frequency of extreme weather, heavy rains and tropical cyclones has increased significantly over the last two decades. The need to adapt to a changing climate is considered throughout the document.

This National Strategic Framework sets out a vision of a safe, adaptive, and resilient nation, and sets the path for a country where residents and visitors are increasingly safe from hazards and the risk of disaster. The National Strategic Framework's vision is consistent with the National Disaster Risk Reduction and Management Policy that disaster impacts should be proactively reduced to the lowest levels possible with available resources. Meeting this vision will result in reduced disaster impact and improved livelihoods, health, economic growth and social development for the Republic of Mauritius.

Achievement of this vision is supported by the following five strategic pillars:

1. Understanding Disaster Risk through a Risk Culture
2. Strengthening Disaster Risk Governance to Manage Disaster Risk
3. Investing in Disaster Risk Reduction for Resilience
4. Enhancing disaster preparedness for effective recovery, rehabilitation and reconstruction
5. Strengthen long-term capacities, support the implementation of the Africa Regional Strategy for Disaster Risk Reduction and the Sendai Framework and systematically contribute to building resilience to disasters, with a special focus on the most vulnerable groups

This National Strategic Framework encapsulates four interlinked goals derived from the Strategic Pillars:

1. Increase the ability to manage risks at individual to societal levels.
2. Reduce current risks to levels which are as low as reasonably possible.
3. Avoid the creation of new risks or raising the level of current risks.
4. Ensure that preparedness, warning, response, and recovery are as effective and efficient as possible to reduce impacts and facilitate a rapid return to normal.

This National Strategic Framework sets out four strategic objectives across risk governance, risk reduction, warning and alert and preparedness, response and recovery which define the detailed risk management activities set out in the National Disaster Risk Reduction and Management Action Plan.

# 1. Introduction

## 1.1. The Disaster Challenge for the Republic of Mauritius

There is no doubt that the Republic of Mauritius has experienced significant disasters. For instance, in 1994 Cyclone Hollanda destroyed 50% of sugar plantations on the island of Mauritius, with damage totalling over US\$ 135 million, or the equivalent of US\$ 238 million in 2020<sup>1</sup>. The following week, Cyclone Ivy affected both Mauritius and Rodrigues<sup>2</sup>.

As a Small Island Developing State (SIDS), the Republic of Mauritius is vulnerable to severe weather events and disasters such as cyclones, storm and tidal surges, torrential rains, floods and flash floods, landslides, tsunami and technological disasters, amongst others. When the Mauritian disaster response mechanisms were overwhelmed by the 2013 flash floods, whereby 11 persons lost their

Disasters cost lives, damage livelihoods, disrupt society and the economy, and harm the natural environment.

lives, there was wide recognition of the need to have stronger institutional and policy mechanisms not only for the response to disasters, but also to prevent and reduce disaster risks.

The frequency of extreme weather events, heavy rains and storms of tropical cyclone strength or higher, has increased significantly over the last two decades. Recent studies carried out by the Mauritius

Meteorological Services (MMS) clearly shows an increasing trend in the number of storm formations over the last 32 years, as well as the number of storms reaching tropical cyclone strength (winds above 165 km/hr).

The relatively small land mass and physical isolation of the country increase the potential for disasters which have a whole-of-country impact. In these circumstances, it may take weeks for supplies for response, relief and recovery to arrive from locations hundreds of kilometres away.

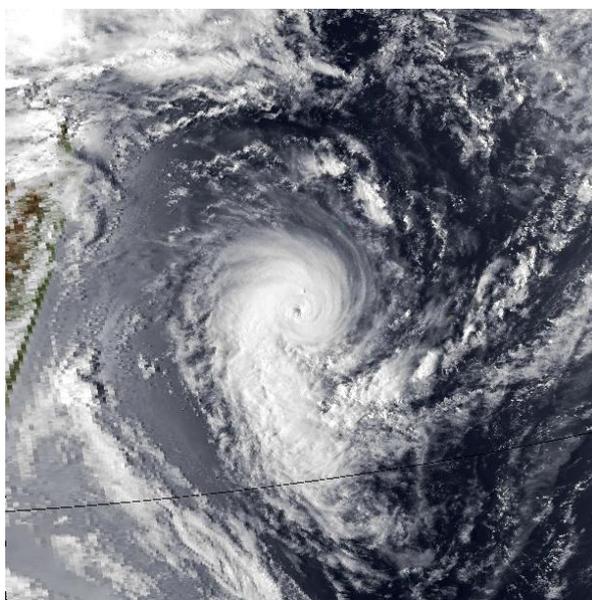


Figure 1: Cyclone Hollanda over Mauritius Island

The COVID-19 pandemic, which began in late 2019, identified new challenges for managing disaster impacts and risks for the country. In particular, the pandemic demonstrated a need to think beyond a whole-of-country disaster to one which is a global event threatening not only lives but also the economy and food supply of the Republic of Mauritius.

The grounding of the MV Wakashio in July 2020, and the subsequent oil spill, demonstrated the vulnerability of the Republic of Mauritius to a range of technological hazards. The response to the grounding and oil spill demonstrated that, for some crises, there is a need to develop capacity to respond, which includes integrated external technical assistance.

Disasters cost lives, damage livelihoods, disrupt society and the economy, and harm the natural

<sup>1</sup> Calculated using <https://www.inflationtool.com/us-dollar/1994-to-present-value?amount=135000000>  
<sup>2</sup> <https://reliefweb.int/report/mauritius/mauritius-cyclones-hollandaivy-feb-1994-un-dha-situation-reports-1-5>

environment. Disasters also slow development. Development, if risk-wise and focused on building resilience, can reduce the likelihood of disasters, and mitigate impacts when disasters do occur.

Sustained growth and improved living conditions since independence in 1968 have reduced risks from some disasters in the Republic of Mauritius. Local risk transfer mechanisms have been established, for instance for drought and cyclone damage to sugar production.

Investments have been made in risk reduction infrastructure, particularly for flooding. An increase in personal means, together with government programmes to improve the quality of housing, have helped families to be more disaster resilient.

Yet, as with most countries, the Republic faces a constant and evolving threat from disasters. The threat is constant given the wide range of hazards which confront the country (at least 41 – see section 2.4.1, below). The threat is evolving given the evolution of technology, modifications to the natural environment, and changes to the climate. Development can redefine the nature of hazards and vulnerabilities facing the country, reducing the significance of some, but also dramatically increasing the threat from others.

The COVID-19 pandemic, which began in late 2019, identified new challenges for managing disaster impacts and risks for the country.

The Republic of Mauritius has been progressively improving its ability to address disaster risks. At the time of the Hyogo Framework for Action 2005-2015<sup>3</sup>, the Republic began developing a disaster risk management strategy<sup>4</sup>. One outcome was the National Disaster Risk Reduction and Management Act, 2016 (hereafter, the Act).

The Act significantly expanded the scope and formal structure for disaster risk reduction and management in the Republic. The Act establishes a requirement for National Disaster Risk Reduction and Management Policy (hereafter, the National Policy). To implement the National Policy, the Act calls for the development of a National Disaster Risk Reduction and Management Strategic Framework (hereafter, the National Strategic Framework), complemented by a National Disaster Risk Reduction and Management Action Plan 2020-2030 (hereafter, the National Action Plan). Establishing these two documents is also part of the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030<sup>5</sup>.

## 1.2. Disaster Risk Reduction and Management Framework

This National Disaster Risk Reduction and Management Strategic Framework for the Republic of Mauritius sets out: <sup>6</sup>

- An overview of the hazards, vulnerabilities and risks faced by the Republic,
- A vision for disaster risk management, and
- The strategy to attain this vision from 2020 to 2030.

The National Strategic Framework is based on an all-inclusive approach. It engages the Government, communities, the private sector, Non-Governmental Organisations, civil society, and individuals in reducing disaster risk and improving resilience. The National Strategic Framework incorporates generally accepted good practices in disaster risk management, including attention to gender, age,

<sup>3</sup> <https://www.unisdr.org/2005/wcdr/intergov/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>

<sup>4</sup> **DRR Strategic Framework and Action Plan - Final Report** (2012). Ministry of Environment and Sustainable Development, Republic of Mauritius

<sup>5</sup> <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

<sup>6</sup> Under the **Act**, Rodrigues is also to develop a **Strategic Framework**. These are based on the nation-level document.

and health status as well as an ecosystem-based approach to risk management to support a sustainable future.

Implementation of the National Strategic Framework is through a National Action Plan structured around actions taking place in the near term (2020–2023), during a midterm (2024–2027), and for an endpoint (2028–2030). Together the **National Action Plan** and **National Strategic Framework** provide a single approach to disaster risk reduction.

The National Strategic Framework and the National Action Plan are in line with the guidance set out in the Sendai Framework for Disaster Risk Reduction 2015–2030<sup>7</sup>, the African Union Programme of Action for the Sendai Framework<sup>8</sup>, the Small Island Developing States Accelerated Modalities of Action (SAMOA Pathway)<sup>9</sup> as well as the Sustainable Development Goals<sup>10</sup>. Recognizing the significant impact of climate-related hazards on the Republic of Mauritius, the National Strategic Framework also considers the Paris Climate Agreement<sup>11</sup> (see the following section for more details).



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<sup>7</sup> <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

<sup>8</sup> <https://www.undrr.org/publication/programme-action-implementation-sendai-framework-disaster-risk-reduction-2015-2030>

<sup>9</sup> <https://sustainabledevelopment.un.org/sids2014/samoapathway>

<sup>10</sup> <https://www.un.org/sustainabledevelopment/>

<sup>11</sup> <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

## 2. The Mauritian Context

### 2.1 Geography

The Republic of Mauritius is a Southern Hemisphere Small Island Developing State (SIDS) located in the upper southwest quadrant of the Indian Ocean. The island of Mauritius is approximately 5,800 kilometres (km) west of Perth, Australia, 4,650 km southeast of Mumbai, India and 150 km northeast of Reunion Island.

The Republic of Mauritius comprises the islands of Mauritius, Rodrigues, Agalega, Tromelin, Cargos Carajos (St Brandon) and the Chagos Archipelago. Rodrigues, the country's second largest island, is approximately 580 km east from Mauritius Island. Tromelin island is approximately 580 km northwest of Mauritius, Agaléga Islands are approximately 1,000 km north of Mauritius, and the Cargados Carajos (Saint Brandon) are 450 km east of north from Mauritius Island. The Chagos Archipelago is located approximately 2,000 km northeast from Mauritius Island. The relative isolation of the land areas of the Republic of Mauritius creates challenges for disaster risk reduction and management which are not encountered in many SIDS.

Mauritius and Rodrigues are of volcanic origin and ringed by coral reefs. The Cargados Carajos Shoals are on top of an eroded volcanic hot spot. The nearest active volcano is on Reunion Island. Most of the beaches on the islands are composed of eroded coral. The highest point on Mauritius is 828 meters and on Rodrigues, 398 meters.<sup>12</sup>

The land area of Mauritius Island is 1,864 km<sup>2</sup>, while the land area of Rodrigues is 104 km<sup>2</sup>. The Exclusive Economic Zone (EEZ) of the Republic of Mauritius ranks 20th globally in terms of size, at approximately 2.3 million km<sup>2</sup>. An additional expanse of extended continental shelf area of approximately 400,000 km<sup>2</sup> is co-managed with Seychelles, following a joint submission made by the two countries to the United Nations in 2011.

The climate of the Republic is mild tropical. Mauritius island has two seasons, a warm summer from November to April and a dryer, cooler winter from May to October. Long term mean annual rainfall (1961-2007) is 2,010 mm. Precipitation averages 1,344 mm in the summer and 666 mm in winter.<sup>13</sup> For Rodrigues Island, long term mean rainfall (1961-2007) is 1,116 mm, with 65% falling during the summer.<sup>14</sup> The cyclone season across the Republic is November to April, although severe storms can occur in any month.

Mauritius is divided into nine districts: Black River, Flacq, Grand Port, Moka, Pamplemousses, Plaines Wilhems, Port Louis, Riviere du Rempart, and Savanne. Rodrigues island is an autonomous region of the Republic of Mauritius. Agaléga and Cargados Carajos Shoals have the status of dependencies.

### 2.2 History and Economy

The Republic of Mauritius gained independence from the United Kingdom in 1968. Society, culture and aspects of the economy reflect the periods of English and French colonisation as well as the movement of slaves, workers and their families to the islands during the colonial period. A number of factors contributing to today's disaster risk are linked to colonial period policies, including settlement patterns, land tenure, and flood risks.

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<sup>12</sup> Encyclopaedia Britannica, [Mauritius: Relief and Drainage](#)

<sup>13</sup> <http://metservice.intnet.mu/>

<sup>14</sup> <http://metservice.intnet.mu/>

The country has a population of approximately 1.3 million (2018)<sup>15</sup> with close to the same number of tourist arrivals that year.<sup>16</sup> The population is concentrated on Mauritius (630 persons/km<sup>2</sup>), and Rodrigues Islands (345 persons/km<sup>2</sup>). Nationwide, 75% of the population is located in urban areas (2,000 persons/km<sup>2</sup>), primarily in the Port Louis and Plaines Wilhems Districts of Mauritius island.<sup>17</sup> Most tourist lodgings are found in narrow coastal belts around Mauritius island.

The Republic of Mauritius is an upper middle income country.<sup>18</sup> Per capita Gross National Income in 2019 was US\$ 12,740.<sup>19</sup> The economy is divided into three main areas: Services (74%), Industry (22%) and agriculture (4%).<sup>20</sup> Approximately 8% of the labour force is involved in agriculture, 30% in industry and 62% in services.<sup>21</sup> In 2018, the Republic's Human Development Index (HDI) was 0.796, up from 0.674 in 2010.<sup>22</sup> The country has a literacy rate of 91.3% for people 15 years and older.<sup>23</sup>

## 2.3 Recent Disaster History

The Republic of Mauritius is, unfortunately, disaster prone. The Preliminary Analysis of Disaster Data for the Republic of Mauritius – 1960-2018<sup>24</sup> report used disaster-related data for the 1960-2018 period to identify the most significant disasters affecting the Republic in recent times.

As indicated in Figure 2, below (from the Preliminary Analysis report<sup>25</sup>), in terms of the number of disasters, weather-related events were the most common type of disaster, with cyclones, torrential rainfall and flooding the most common among these types of events. As the figure also indicates, fire is a major cause of damage while an additional 13% of disasters are technological in nature (gas spills, port area hazards, boat accidents).

Based on the 1960-2018 data compiled by the National Disaster Risk Reduction and Management Centre<sup>26</sup>, 814,330 persons were directly impacted, 98% due to cyclones. A total of 490 disaster-related fatalities were reported for 1960 to 2018, with 161 from aircraft accidents, of which 159 fatalities were from one aircraft accident<sup>27</sup>. Of the remaining 329 fatalities, 41% were due to cyclones, 12% to other weather-related events, and 29% due to structural fire.

The 1960-2018 data indicates that 42,000 buildings were destroyed by disasters with losses totalling at least US\$ 2.6 billion (not adjusted for inflation). This number likely significantly underestimates the total cost of disasters over the 58 years for which data is available.

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<sup>15</sup> <http://statsmauritius.govmu.org/English/StatsbySubj/Pages/INTERNATIONAL-TRAVEL-and-TOURISM.aspx>

<sup>16</sup> Op sit.

<sup>17</sup> <http://documents.worldbank.org/curated/en/745951492576843300/pdf/114353-WP-PUBLIC-disaster-risk-profile-mauritius.pdf>

<sup>18</sup> DAC List of ODA Recipients: Effective for reporting on 2020 flows

<sup>19</sup> Purchase price parity, Atlas method, <https://data.worldbank.org/country/mauritius>

<sup>20</sup> 2017, <https://www.cia.gov/library/publications/the-world-factbook/geos/mp.html>

<sup>21</sup> 2014, <https://www.cia.gov/library/publications/the-world-factbook/geos/mp.html>

<sup>22</sup> <http://hdr.undp.org/en/countries/profiles/MUS>

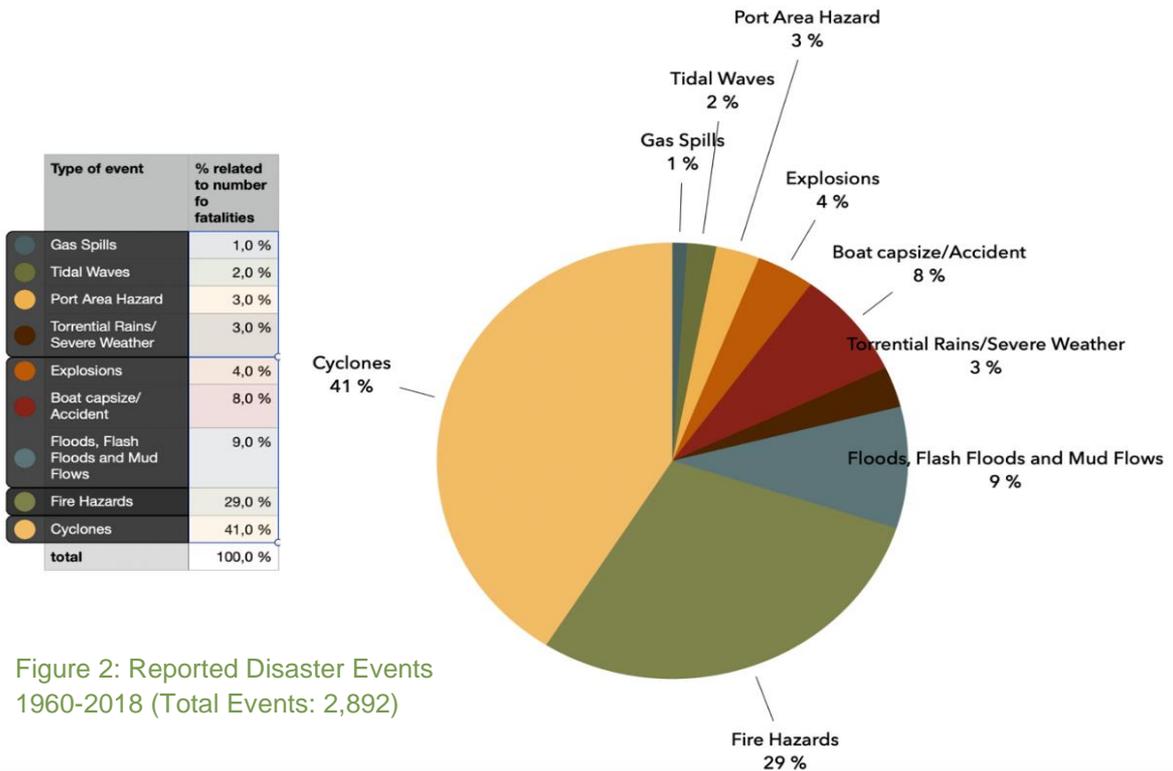
<sup>23</sup> <http://uis.unesco.org/en/country/mu>

<sup>24</sup> Available from the National Disaster Risk Reduction and Management Centre. The data for 1960 to 2014 is drawn from the DesInventar data base. The data for 2015-2018 is drawn from the Mauritius Disaster Information System (MauDIMS)

<sup>25</sup> From **Preliminary Analysis of Disaster Data for the Republic of Mauritius – 1960-2018**, available from the National Disaster Risk Reduction and Management Centre

<sup>26</sup> **Preliminary Analysis of Disaster Data for the Republic of Mauritius – 1960-2018**

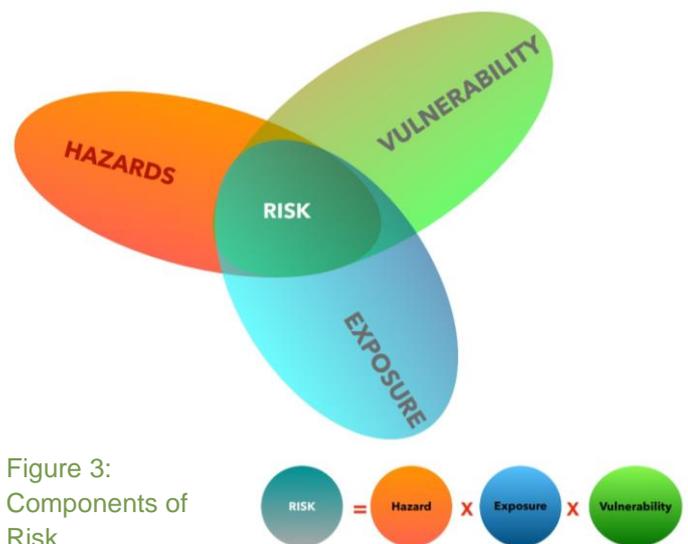
<sup>27</sup> The 159 fatalities were associated with the crash of a South African Airways aircraft 250 kilometers northeast of Mauritius Island in 1987. See <https://aviation-safety.net/database/record.php?id=19871128-0> for more details.



The available historical disaster data does not allow for a more precise identification of some impacts (e.g., what specifically has caused the damage and fatalities from torrential rainfall or cyclones). Further disaggregation of the disaster-related data, including by gender, age, disability, or health status -based impacts, would be useful to understand the importance of different risks and define targeted risk reduction measures. Specific attention is needed to which elements of a cyclone, wind, precipitation or sea surge, have been the most damaging over time. This would allow for a better targeting of disaster preparedness and risk reduction measures.

## 2.4 The Nature of Disaster Risk Facing the Republic of Mauritius

Planning for disaster risk reduction, response and recovery requires understanding how different magnitudes and frequencies of hazards combine with physical and social vulnerability create disaster risks. This understanding comes from an analysis of historical data, and from detailed analysis of the nature of hazards, vulnerabilities and resulting risks. The following sections summarise the current state of hazard, vulnerability and risk assessment for the Republic.



### 2.4.1 Hazards Faced by the Republic of Mauritius

The Republic of Mauritius experiences a range of hazards, as indicated in Figure 4, below. The hazards were identified based on consultations with stakeholders in the Republic of Mauritius. They are grouped base on the guidance provided by the Hazard Definition & Classification Review Technical Report.<sup>28</sup>

Figure 4: Hazards Encountered in the Republic of Mauritius



<sup>28</sup>

UN Department for Disaster Risk Reduction and International Science Council, 2020, United Nations

## | Geo-Hazards |



18. Earthquake



19. Tsunami



20. Coastal Erosion



21. Landslides



22. Rockfalls



23. Slope Failure



24. Debris Flows



25. Volcanic Eruption  
(including ash clouds)

## | Technological Hazards |



26. Aircraft Accident



27. Air Pollution



28. Building Collapse



29. Hazardous Chemical  
Spill and Exposure



30. Explosion



31. Extreme Sport and  
Tourism-Related Accidents  
("Adventure Tourism")



32. Hazardous materials



33. Infrastructure Failure  
(e.g. dams, transport)



34. Maritime Accident,  
including ship grounding,  
collision, sinking, and  
capsizing



35. Mass Casualties (incl.  
transport accidents)



36. Oil Spill (marine and  
terrestrial)



37. Radioactivity



38. Small Craft Accidents  
(diving, swimming...)



39. Structural Fire



40. Water Contamination  
41. Water Supply Shortage

This grouping is not without nuance. For instance, cyclones are a significant hazard for the Republic of Mauritius. Damage from cyclones is usually associated with high winds and rainfall leading to flash floods and landslides. Yet, some cyclones may result in limited rainfall and cause most damage due to high winds and not be associated with flooding or landslides.

At the same time, flash floods and landslides can be triggered by normal seasonal weather conditions, or land use changes, for instance as a result of deforestation. Understanding the links between hazards and changes to the environment is critical to understanding disaster risk.

Changes to the Republic of Mauritius' climate are a major concern in defining the future frequency and magnitude of hydrometeorological hazards. Attributing changes in hazard frequency or magnitude to specific changes in climate averages is currently difficult. Mauritius Meteorological Services' analysis indicates no net increase in the number of cyclones, but the number of storms reaching cyclone strength and the rate of intensification have increased. The intensity and frequency of intense rainfall events are expected to increase.<sup>29</sup>

## Changes to the Republic of Mauritius' climate are a major concern in defining the future frequency and magnitude of hydrometeorological hazards

Periods of dry weather appear to be increasing and lasting longer than wet periods. Short term wet periods (3-6 months) may also be increasing. Given current uncertainties, information on the frequency, magnitude and impact of hydrometeorological hazards needs to be continually updated to reflect current science and evidence of a changing climate.<sup>30</sup>

It is important to recognise that hazard events far from the Republic of Mauritius can have impacts on the country. A seismic tsunami generated across the Indian Ocean can have a direct impact on the Republic. A volcanic eruption near the Red Sea could disrupt air and maritime traffic to the country. As a result, hazard monitoring needs to extend beyond the Republic's physical borders and consider how distant events could affect the nation.

Human disease, as a hazard, presents several challenges. The COVID-19 pandemic provides an excellent example of how a hazard which developed far from Mauritius can have a dramatic impact on the country in a very short period of time.

Outbreaks of vector-borne diseases often arise from human modifications to the environment, through land use changes, inadequate drainage infrastructure or waste management. Non-communicable illnesses can also create disaster-like conditions for specific segments of the population, for instance, cardio-vascular diseases for older persons. Animal diseases can pass on to affect humans, leading to unanticipated diseases for which humans have limited initial resistance.

In each case, the initial response to the hazard comes from the health sector. However, long term reduction in these health risks involves a wide range of other stakeholders and requires a multi-sector approach which goes beyond health care alone.

Diseases and pests affecting animals and plants generally have an economic impact much different in scale and scope than from flooding or a landslide. Reducing and responding to disease-related impacts usually requires a range of stakeholders not normally involved in responding to a flood or landslide.

Anthropogenic (i.e., chemical or technological) hazards can cause significant loss of life, economic disruption and damage. While many such hazards are of low likelihood based on historical data, their impact can be severe and lead to significant and long term damage to the Republic as a whole. Reducing the risk from many anthropogenic hazards can yield benefits in collateral risk reduction; for instance, improved building codes to reduce fire risk can also reduce wind damage.

A distinction is made between individual accidents and mass casualty events. Generally, single traffic accidents are not considered disasters. However, traffic accidents can lead to mass casualties, requiring a disaster-level response. Further, social norms may consider that the cumulative impact of many single traffic accidents leads to a cumulative level of fatalities that requires a disaster management-based approach to reduce overall losses to society. Improved capacities to deal with

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<sup>29</sup> <http://metservice.intnet.mu/climate-services/climate-change.php>

<sup>30</sup> <http://metservice.intnet.mu/climate-services/climate-change.php>

single accidents creates the basis for better mass casualty incident management, whether from traffic or other types of accidents.



As assessment of possible disaster impacts should consider natural-technological (Natech) hazards. Natech hazards are the combination of natural and technological hazard events occurring at the same time, usually with the technological hazard being triggered in some manner by the natural hazard event. For example, where cyclone winds caused oil storage tanks to fail, leading to an oil spill during the cyclone. Considering possible Natech hazards is necessary because the response to these events is often very technically complicated and takes place during severe weather or other extreme conditions. (See Box 3, below, on the MV Wakashio Grounding.)

Adventure-related tourism presents a relatively new set of hazards for the Republic. With this type of hazard, a tourist intentionally undertakes actions which are inherently dangerous but are expected to be managed in a way that only provides a sense of adventure and no real risk of harm. The challenges from this type of hazard are two-fold: (A) the technical systems involved (e.g., zip lines, wild animal fencing, etc.) may fail or, (B) the natural conditions on which the tourism depends (e.g., high winds) may exceed safe limits. Either challenge can lead to accidents for which emergency services are not always well prepared and, at times, take place far from where the emergency services are based. While the physical and human impact of hazards related to adventure tourism may not be significant in numbers, such events could result in a significant impact on the tourism sector, with knock-on impacts on income and jobs.

With at least 41 hazards present in the Republic of Mauritius, effective risk management requires that the frequency and magnitude of each hazard be defined.

Its mid-ocean position places the Republic of Mauritius across a significant trans-Indian Ocean transport corridor. Sir Seewoosagur Ramgoolam International Airport is the first major airport west of Perth for trans-South Indian Ocean flights. Significant ocean transport corridors pass on either side of Mauritius and Rodrigues, and close to other islands of the Republic. The Indian Ocean surrounding the Republic is a significant fishing ground, with fishing fleets spread over a large area.

All these factors place Mauritius, and even more so Rodrigues, as likely hubs in the response to air and sea disasters. While air and maritime emergencies

are rare, the Republic is one of the few call-out points for emergency assistance in the Indian Ocean between India, Indonesia, Australia, Antarctica and the African mainland. As a result, it needs to have the capacity to respond when lives are at stake.

With at least 41 hazards present in the Republic of Mauritius, effective risk management requires that the frequency and magnitude of each hazard be defined. This work also needs to consider how different hazards may interact (e.g., forest fires followed by heavy rainfall contributing to landslides), and the potential for Natech events. The resulting hazard assessment data, when combined with information on vulnerability (discussed below) provides the basis for planning and implementing risk reduction efforts.

## 2.4.2 Vulnerability to Hazards

UNDRR defines vulnerability as *“the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.”*<sup>31</sup> Vulnerability to a hazard event defines whether the hazard event leads to a disaster or is simply an event of interest.

Vulnerability can be divided into two broad categories:

- a) Physical vulnerability, that is the potential for a hazard of a specific magnitude and frequency (i.e., a hazard event) to damage structures, roads, harbours and other physical infrastructure, possessions and other real property, natural resources, crops, orchards and livestock, and natural resources in general. This damage is usually reported as the monetary value of losses. Defining physical vulnerability is straightforward when hazard frequency, magnitude and the location of physical assets are known. However, the process can involve collecting and processing considerable volumes of data, which can be costly.
- b) Social vulnerability is the impact of a hazard on society at the individual and group levels. Social vulnerability is nuanced and can vary significantly across gender, age, economic means, etc. Assessing social vulnerability requires considering the impacts of a hazard event on natural, social, human, physical, financial, and governance assets at the individual level and for specific groups within a society (e.g., women, single headed households, fisher folk, etc.). Assessing social vulnerability can be complicated and often involves the use of indirect indicators such as income, education or occupation.

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<sup>31</sup> See <https://www.undrr.org/terminology>

## | Box 1: Gender, Age, Health and Disability Status |

The need to consider gender, age, health and disability status in disaster risk management has gained increased recognition in the past decade. For instance, female-headed households may be more vulnerable to disaster shocks. The elderly may be less agile when there is a need to evacuate quickly over steep terrain. Those facing health challenges, for instance a need to use a wheelchair, can face difficulties when evacuated due to flooding or wind damage to their homes.

Considering gender, age, health and disability status as part of disaster risk management begins with identifying who may be vulnerable and why. This should be followed with specific interventions to reduce this vulnerability, whether it be in making evacuation shelters wheelchair accessible or installing a concrete-slab roof on a building used by a female-headed household to reduce wind damage.

Addressing gender, age and health status issues which increase disaster risk is not a single-focus effort. It requires that gender, age and health status be given first consideration in understanding disaster risks, in reducing these risks, and in how warning, response and recovery are delivered. As a result, gender, age and health status considerations are set out in the **National Disaster Risk Reduction and Management Policy** and mainstreamed across the **National Strategic Framework's** vision, strategy, and objectives, and in the work set out in the **National Action Plan**.

In general, as income increases within a society, vulnerability decreases and coping and adaptation capacities increase. This occurs even as absolute damage increases because those affected have more means to prepare for and address the impacts of a disaster.

As an upper middle income country, the population of the Republic of Mauritius would be expected to be relatively less vulnerable to hazard impacts than lower income countries facing similar hazards. However, this depends on the extent to which growing wealth in the Republic has been equitably spread across all segments of the country.

**In conclusion, physical vulnerability to hazards can be relatively easily assessed [...] Social vulnerability is more complicated**

A recent World Bank report<sup>32</sup> indicates that there has been an increase in income inequality, particularly affecting single-headed households (predominantly headed by women). This suggests that vulnerability to hazards is not uniform across society, with some groups being significantly more vulnerable than others.

Another aspect of vulnerability lies with the quality of housing and the nature of settlements. For instance, as identified in the Diagnosis of Capacities to Manage Disaster Risk – Mauritius<sup>33</sup> report, families with zinc-roofed houses are more likely to suffer wind damage during cyclones. Where female-headed households cannot afford more wind resistant roofing (particularly concrete slabs) wind damage can lead to female-headed households more likely to need to use evacuation centres.

In addition, poor settlement conditions – poor housing, uncertain land tenure and limited services – often create conditions where hazards, particularly high winds and rain associated with cyclones and other severe weather, can lead to significant losses. These issues are discussed further in the Diagnosis of Capacities to Manage Disaster Risk – Mauritius<sup>34</sup> report mentioned above. The Government's programme to provide legal title to land housing for those occupying land irregularly

<sup>32</sup> Mauritius: Addressing Inequality through More Equitable Labor Markets (2017). The World Bank Group

<sup>33</sup> October 2019, CADRI Partnership, Capacity for Disaster Reduction Initiative

<sup>34</sup> October 2019, CADRI Partnership, Capacity for Disaster Reduction Initiative

plays a role in reducing vulnerability. However, there remain significant urban and peri-urban areas where settlement conditions heighten the threat of natural and other hazards.

Understanding the situation at the community level is important for risk reduction efforts. Households at the lower end of the income range may be less able to pay for risk reduction measures when compared to other households with greater financial and other assets. This can lead to a patchwork of more and less vulnerable households over very small distances, particularly in population-dense urban areas.



Income inequality also impacts preparedness, warning, and response and recovery capacities. Households with fewer financial and other assets may need more support to prepare for disasters, face constraints on taking action when warned (e.g., stopping work and forgoing income), and find recovery more difficult.

A specific group which needs to be included in assessing social vulnerability are visitors to the Republic of Mauritius. In general, visitors are less aware of the hazards present in the Republic than residents and less aware of preparedness and warning systems. Steps have been taken to ensure the tourism sector can assist visitors if a disaster threatens. However, because tourists largely depend on tourism services providers (e.g., tour companies, hotels, airlines, etc.) during a crisis, they are considerably more vulnerable than resident populations. Accentuating this vulnerability is the fact that the Southern Hemisphere cyclone season is when proportionally more tourists are visiting the Republic of Mauritius, and many tourists reside in the coastal zone.

In addition to tourism-related infrastructure, other key infrastructure is located in the coastal zone or other vulnerable areas. For example, three prisons (Petit Verger Prison, Grand River North West Remand Prison and Rodrigues Prison) are located along the coast, and are therefore exposed to the hazards present in this zone, including tsunamis, tidal waves, sea level rise, etc.

In conclusion, physical vulnerability to hazards can be relatively easily assessed, if event magnitude and frequency are known. Social vulnerability is more complicated, reflecting the complexities of society in general and challenges posed by a changing economy and income inequality. The Republic of Mauritius faces the additional challenges of assessing the vulnerability of visitors, which

are a very diverse group in terms of age, health status and experience dealing with the hazards found in Mauritius.

### 2.4.3 Defining Disaster Risks

The 2012 DRR Strategic Framework and Action Plan project<sup>35</sup> developed an assessment for inland flooding, landslides, rockfalls and rapid earth movement, and coastal inundation with consideration for possible modelled changes to the climate. The results are provided in terms of locations, agricultural lands, and infrastructure (e.g., schools, roads, hotels, etc.) at medium, high and very high levels of risk (as defined by the project), and quantified into potential losses in Mauritius Rupees. The information provided is in relatively fine detail (e.g., identification of a specific school at high flood risk). This detail can be used in mitigating the physical impacts of these hazards.

**The Republic's challenge in dealing with disaster risks rests on two considerations:**

- the country faces on the order of 40 hazards,
- the understanding of hazard impacts and vulnerabilities needs to be disaggregated to the greatest extent possible.

The Disaster Risk Profile for Mauritius<sup>36</sup>, prepared under the Southwest Indian Ocean Risk Assessment and Financing Initiative using a modelling approach, concluded that the Republic experiences combined annual losses of US\$ 110 million per year from earthquakes, floods and tropical cyclones. The report concludes that tropical cyclones are the most significant risk to the Republic, with wind responsible for 80% of damage. Floods triggered by intense rainfall but separate from tropical cyclones were modelled to cause around US\$ 22 million in damages per year. Earthquakes are not a major source of losses on an annual basis, but could cause significant

damage from rare (e.g., 500-year return period) events. The Disaster Risk Profile for Mauritius report does provide small scale mapping of flood-affected locations.

A study on seismic and tsunami risk,<sup>37</sup> conducted in 2019, concluded that both seismic and tsunami risks are low, but events are still possible. Based on this study, Rodrigues appears to be relatively more exposed to tsunami events.

The study noted a need to expand modelling of possible seismic and tsunami-generating events to cover the full range of possible events. A national seismic monitoring network and updated topographic and bathymetric<sup>38</sup> data (the latter including Agaléga Islands) will also improve planning for storm surges and coast flooding. Additional research on seismic events and potential tsunami would be useful, given the low frequency/potential high impact of these events.

The Diagnosis of Capacities to Manage Disaster Risk – Mauritius<sup>39</sup> report provides an overview of hazards, vulnerability, and disasters facing the Republic of Mauritius together with a diagnostic of the need for multi-hazard risk assessment. The report cites cyclones, torrential rains, flash floods, landslides, drought, earthquake, epidemics, fires and technological/industrial hazards as significant for the Republic of Mauritius.

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<sup>35</sup> DRR Strategic Framework and Action Plan Final Report (2012), SGI Studio Galli Ingegneria S.p.A., Centro Euro-Mediterraneo per i Cambiamenti Climatici S.c.a r.l. and Desai & Associates Ltd for the Ministry of Environment and Sustainable Development, Republic of Mauritius

<sup>36</sup> Disaster Risk Profile Mauritius (2016), The World Bank Group

<sup>37</sup> Study on the Vulnerability of the Republic of Mauritius to Seismic Hazard and Tsunami (2019), D. Bertil and S. Le Roy S. BRGM (RC-69240-FR)

<sup>38</sup> Study of the features/relief of "beds" or "floors" of water bodies, also called "submarine topography," or the study of the depths and shapes of underwater terrain

<sup>39</sup> October 2019, CADRI Partnership, Capacity for Disaster Reduction Initiative

The Republic's challenge in dealing with disaster risks rests on two considerations. First, the country faces on the order of 40 hazards. Focusing only on the risks most significant in the past can hide the increased threat posed by other hazards, including the impact of physical and social development on disaster-proneness. Second, the understanding of hazard impacts and vulnerabilities needs to be disaggregated to the greatest extent possible. This is needed as Mauritius island, and somewhat less so Rodrigues, are densely populated. This means that hazard impact, vulnerability and resulting risk can change over very small distances. Addressing risk impacts, whether through better preparedness or risk reduction, needs to consider the large scale variability in risk, and particularly social vulnerability, present in the two main islands of the Republic.

The Diagnosis of Capacities to Manage Disaster Risk – Mauritius<sup>40</sup> report recommends the Republic conduct a multi-hazard risk assessment. These results should be available to disaster risk managers and government officials involved in disaster risk reduction and management, including at the local level. Further, and to promote a wider understanding and engagement in disaster risk management, the risk assessment results should be available to the private sector and accessible to individual residents of the country on-demand. Ensuring wide access and use of the risk assessment information is most effectively done by using a geographic information system to manage risk data and analysis.

Multi-hazard risk information will also improve the precision of warning and alert based on a multi-hazard impact-based forecasting and warning process, as recommended by the World Meteorological Organization (WMO).<sup>41</sup>

Finally, data and analysis from a risk information system enables development of a disaster response decision support system. This system would draw together data and analysis on risk, response capacities, damage assessments and ongoing operations to effectively deliver relief and recovery aid where and when needed. With risk information integrated into the response decision support system, risk reduction becomes an integral part of recovery from disaster.



<sup>40</sup> October 2019, CADRI Partnership, Capacity for Disaster Reduction Initiative.

<sup>41</sup> See [https://www.wmo.int/pages/prog/www/DPFS/Meetings/ET-OWFPS\\_Montreal2016/documents/WMOGuidelinesonMulti-hazardImpact-basedForecastandWarningServices.pdf](https://www.wmo.int/pages/prog/www/DPFS/Meetings/ET-OWFPS_Montreal2016/documents/WMOGuidelinesonMulti-hazardImpact-basedForecastandWarningServices.pdf).

## 2.5 Challenges in Managing Disasters and Disaster Risks

As described above, the Republic of Mauritius has experienced a range of significant disasters. The country continues to face the threat of disaster from a range of natural and anthropogenic hazards.

How hazards impact the Republic will change as development progresses. Generally, as a country develops, there is a reduction in the loss of life but an increase in economic damage from disasters. The disaster risk reduction and management systems in the Republic need to develop and adjust to the changing nature of hazards and how these hazards can result in losses.

This section summarises the key challenges faced by the Republic in creating a disaster risk resilient country. The challenges were identified through consultations with stakeholders in the Republic, expert reports,<sup>42</sup> and comparison of disaster risk management systems in the Republic to international practice. More detail on specific challenges and actions through which they can be addressed can be found in the Action Plan.

### | Box 2: Disaster Risk Reduction and Management in Rodrigues |

The Republic of Mauritius faces a significant disaster risk reduction and management challenge because of its relative isolation in the Indian Ocean. This challenge is even more significant for Rodrigues, because of its relative isolation, limited local resources and reliance on a small port and airport for any assistance in a disaster.

As a result, Rodrigues, its disaster risk governance systems and its population need to be even more resilient than Mauritius island. This resilience needs to be based on understanding risks, engaging all the population in risk management on a daily basis, addressing the causes of vulnerability in a progressing fashion and building institutional and physical capacities to respond to disasters which are potentially catastrophic and which may occur on the high seas. Even more than many other locations, Rodrigues needs to become a risk resilient society with well-developed capacities to manage any disasters if and when they occur.

### 2.5.1 Risk Governance

The disaster risk governance system for the Republic is well developed, with a strong legal basis in the National Disaster Risk Reduction and Management Act 2016 (NDRRM Act) and other legislation and regulations related to fire safety, land use, coastal zone management, environmental impact, water and sanitation, health and disease, education, evacuation, construction and occupational safety. Governance challenges related to laws, regulations and procedures fall into three broad groups:

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<sup>42</sup> Including but not limited to the following: **Assessment of the Capacity Building Needs of First Response Disaster Management Agencies - Final Report** (2016), P. Hayden, TACSYM Ltd, National Disaster Risk Reduction and Management Centre, Ministry of Environment, Sustainable Development, and Disaster and Beach Management, French Agency for Development; **Diagnosis of Capacities to Manage Disaster Risk – Mauritius** (2019) CADRI Partnership, Capacity for Disaster Reduction Initiative; **Disaster Risk Profile Mauritius** (2016), The World Bank Group; **DRR Strategic Framework and Action Plan Final Report** (2012), SGI Studio Galli Ingegneria S.p.A., Centro Euro-Mediterraneo per i Cambiamenti Climatici S.c.a r.l. and Desai & Associates Ltd for the Ministry of Environment and Sustainable Development, Republic of Mauritius; **Draft Gap Analysis Report** (2019), Component 3 - Deliverable D1, Enhancing Resilience to Climate Change (ER2C) In the Republic of Mauritius, DAI, French Agency for Development; **National Disaster Risk Reduction and Management Policies, Strategic Framework and Action Plan** (2019), Component 3 - Deliverable D3, Enhancing Resilience to Climate Change (ER2C) In the Republic of Mauritius, DAI, French Agency for Development; **Standard Operations Procedures Handbook** (2015), National Emergency Operations Command, National Disaster Risk Reduction and Management Centre, Ministry of Environment, Sustainable Development, Disaster, and Beach Management; **The Project of Landslide Management in the Republic of Mauritius, Final Report, Main Report** (2015), Kokusai Kogyo Co. Ltd., Nippon Koei Co. Ltd., Central Consultant Inc., Futaba Inc., Japan International Cooperation Agency, Ministry Of Public Infrastructure And Land Transport (MPI), The Republic Of Mauritius.

- a) Applicable laws, regulations and procedures are not always applied as required. For instance, decisions on morcellement may not take into consideration land use regulations related to flood potential.
- b) Existing laws, regulations and procedures are not fully integrated from a risk management perspective. For instance, environmental review procedures may not fully integrate natural hazard impacts into the decision making process.
- c) Laws, regulations and legal procedures may conflict. For instance, while the NDRRM Act designated the Mauritius Meteorological Service (MMS) as responsible for all natural hazard warnings, the MMS' responsibilities, as defined by the Mauritius Meteorological Services Act 2019, is limited to extreme weather events and tsunami events.

In addition, given that this National Strategic Framework sets out a decade-long process of reducing risks, it is likely that laws, regulations and legal procedures will need to be updated and revised to take into account changes in the nature of disaster risk and risk management.

A second area of attention required in risk governance relates to the institutional structures involved. The National Disaster Risk Reduction and Management Centre has a clear organisational structure (see below). However, the structure appears to place greater attention on response than risk reduction. A review, and adjustment where needed, of how government entities are structured to deal with disaster risk management would be useful to ensure that mandates and functions correspond.

A third area of concern is overlapping institutional mandates. This appears to be the case on flood risk management. Mandate and functional reviews are needed, for at least the most significant hazards, to ensure risks are managed efficiently and without gaps. These reviews also need to consider events with multiple impacts, e.g., the MV Wakashio Grounding, where the response requires a unified engagement across legal mandates.

Finally, related to risk governance is the issue of human capacities. Well defined risk governance systems are not effective if the individuals involved in the systems lack the knowledge, experience and other attributes needed to make the risk governance system work. Adequate human resource should be available to manage risks and respond to incidents in a timely and effective manner. The general and specific human capacity requirements of an effective risk governance system for the Republic need to be defined and turned into a broad, long term development process.

### 2.5.2 Risk Reduction

The development of the Republic is reducing some risks, but also increasing others. The Republic is deeply involved in risk reduction in relation to flooding. Risk reduction measures have also been established for the sugar sector.

As indicated above, the Republic needs to develop a multi-hazard risk assessment and then turn the results into a process which identifies and progressively reduces current levels of risk and manages changes in risk levels associated with progress towards upper income status. This process is linked to several of the points noted above under Risk Governance and involves assessing environmental impacts, land use planning, urban planning and building regulations. These

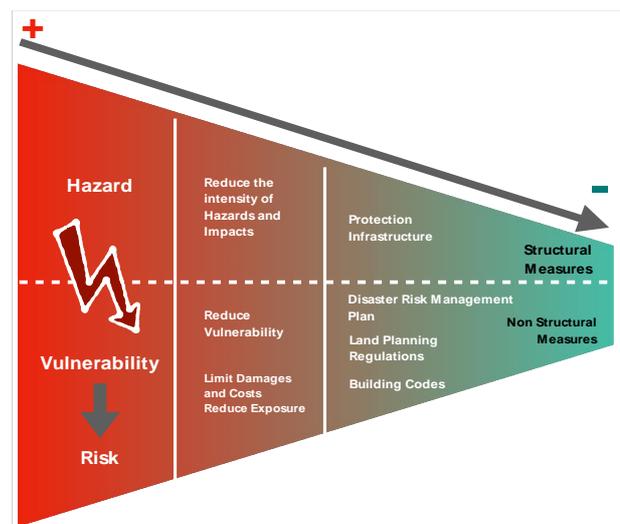


Figure 5: Disaster Risk Reduction

efforts also need to be linked to measures to address climate change, as most of the risks threatening the Republic are linked to climate hazards (see Section 2.6, below).

To complement a better understanding of risk, attention needs to be given to financing risk reduction. As a general approach, the reduction of risk should be incorporated into project design and funding. At the same time, as with flooding on Mauritius island, it may be necessary to fund and implement risk reduction programmes targeting specific hazards, social conditions or locations.

The private sector can also be expected to fund risk reduction. There should be a requirement that developmental investments (e.g., housing estates) incorporate an assessment of risks and risk mitigation costs into their budgets. This approach corresponds to the integration of risk reduction into the development process as set forth in the **Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework)**.

The Government needs to consider whether a cross-government disaster risk reduction platform will provide an effective mechanism to ensure identified risks are being addressed in a comprehensive and coordinated manner. This platform approach can be extended to the private sector and international stakeholders to ensure that the actions associated with this **National Strategic Framework** are implemented over the decade ahead.

### 2.5.3 Warning and Alert

The Republic has a well developed warning and alert system for some, principally meteorological, hazards but also for tsunami, and is working in establishing a dam failure warning system. At the same time, as demonstrated by the COVID-19 crisis, there is a need to expand warning and alert systems to other of the 41 hazards facing the Republic, with, as demonstrated by the MV Wakashio grounding, attention to anthropogenic hazards.

These efforts should be based on the World Meteorological Organization recommended multi-hazard impact-based forecasting and warning process.<sup>43</sup> Although designed initially for meteorological hazards, the approach should be adapted to warning and alert for all significant hazards (based on the risk assessment) facing the Republic.

#### | Box 3: MV Wakashio Grounding |

The MV Wakashio grounding on 25 July 2020 highlighted some of the disaster response challenges faced by the Republic of Mauritius. Severe weather aggravated the condition of the grounded ship before salvage ships could arrive and prevent the ship from shifting on the reef and eventually breaking into two parts.

Separately from the grounding, the break-up of the ship led to oil pollution, which required a separate response from the actual salvage operation. This led to effectively two separate responses, for the grounding and for the oil spill, but with a need for each operation to be closely coordinated with the other.

The Government was quick to request external assistance, which arrived even in the face of COVID-19 restrictions. To coordinate the response, four groups were established - Strategic and Coordination; Operations and Response; Social and Environmental Impacts Evaluation; and Forensic, Claims and Finance. And again, despite the COVID-19 situation, the Republic received a number of foreign assistance teams and external support for the response.

While only one of two recent ship groundings, the MV Wakashio experience demonstrated the challenges created by the relative physical isolation of the Republic while also demonstrating an ability to adapt response structures to a compound technological disaster. These experiences, together with the

<sup>43</sup> See [https://www.wmo.int/pages/prog/www/DPFS/Meetings/ET-OWFPS\\_Montreal2016/documents/WMOGuidelinesonMulti-hazardImpact-basedForecastandWarningServices.pdf](https://www.wmo.int/pages/prog/www/DPFS/Meetings/ET-OWFPS_Montreal2016/documents/WMOGuidelinesonMulti-hazardImpact-basedForecastandWarningServices.pdf)

experience of having to deal with multiple foreign assistance teams, provides useful lessons for planning for future major, island-wide disasters.

To complement the technical development of warning capacities, attention is needed to the delivery and comprehension of warning messages. This alerting process should be based on the WMO forecast and warning approach and be designed to adapt to new communication technologies and approaches which develop over the next decade.

## 2.5.4 Preparedness, Response and Recovery

The Republic has invested in an extensive system for preparedness, response and recovery. A clear structure of disaster response has been developed out of the **National Disaster Risk Reduction and Management Act 2016**, as described in Section 3, below. A Disaster Response Unit exists within the Special Mobile Force.

The **National Disaster Scheme**<sup>44</sup> covers Cyclones, Heavy Rainfall, Torrential Rain and Flooding, Tsunami, High Waves, Water Crisis, Earthquake, Landslide and a Port Louis Flood Response Plan. Other plans cover oil spills, aircraft accidents, and health events. Contingency plans have been developed for a number of locations across Mauritius subject to flooding. The country has identified evacuation shelters and established plans for their management.

As identified by the MV Wakashio grounding, there is a need to continually update, test and practice preparedness, response and recovery plans. The **National Disaster Scheme** can be expanded into a more comprehensive disaster response plan, covering warning and preparedness actions as well. Consideration can be given to either integrating recovery plans into the **National Disaster Scheme** or developing a separate Recovery Framework.

Operationally, capacities need to be developed for advanced disaster response training (e.g., for rescue services and port authorities) as well as holding live simulation exercise. Given the human capacity requirements of implementing effective disaster risk management, expanded education and training on various aspects of risk management need to expand in the formal education system, as well as specifically for the skills needed to respond to disasters once they occur.

## 2.6 Cross-Sectoral Collaboration on Risk Management

Climate change adaptation (CCA) must play an essential role in Disaster Risk Reduction and Management (DRRM) in Mauritius because climate change affects both factors that cause disasters: hazards and vulnerability. Climate change will both increase hazards (through increased extreme weather events, for example), and increase vulnerability caused by increased food and water insecurity (for example, due to drought), climate-induced displacement, and loss of livelihoods reliant on ecosystem services.<sup>45</sup>

The United Nations Office for Disaster Risk Reduction (UNDRR) estimates that globally, “76% of all disaster events were hydrological, meteorological or climatological”.<sup>46</sup> As noted in Section 2 above, this generalisation holds true in the Republic of Mauritius. It is therefore unsurprising that the Sendai Framework’s definition of Disaster Risk Management states that “Linkages to sustainable development and climate change adaptation plans should be made where possible.”

<sup>44</sup> (2015) National Disaster Risk Reduction and Management Centre, Ministry of Environment, Sustainable Development, and Disaster and Beach Management, Republic of Mauritius, Line Barracks, Port-Louis, Mauritius.

<sup>45</sup> See, for example, UNDRR [Climate Change and Disaster Risk Reduction: Weather, climate and climate change](#) (September 2008)

<sup>46</sup> UNDRR [Climate Change and Disaster Risk Reduction: Weather, climate and climate change](#) (September 2008)

Industry experts have noted the significant cost savings of applying a DRRM approach to CCA as far back as the Stern Review, which noted that taking early action (as advocated by DRR approaches) to address the adverse effects of climate change could cost around 1% of global GDP/year, compared to 5-20% in the absence of a DRRM approach.<sup>47</sup> By leveraging existing knowledge of and efforts to mitigate the effects of extreme weather events from DRRM, CCA efforts will be enhanced, and coordination will allow for cost sharing. Such cost savings can be further enhanced through increased use of forecasting, due to the savings often generated by taking early action.<sup>48</sup>

For example, UNDRR has analysed a series of best practice examples on this topic, all of which involve combining DRRM and CCA in the same policy documents, action plans, and legislation, and place these under the strong leadership of the highest levels of government.<sup>49</sup> In all of these best practice examples, strong political leadership and multi-stakeholder approaches were essential.

Based on these best practice examples, UNDRR developed the following recommendations for combining DRRM and CCA initiatives, which have been utilised in the development of this National Strategic Framework:<sup>50</sup>

- a) Map the institutions, policies and mechanisms already in place for reducing disaster risk and dealing with climate change adaptation.
- b) Take stock of the available information on hazards, exposure, vulnerabilities and risk assessments.
- c) Convene multi-stakeholder discussions to review information and identify opportunities to harmonise policy and address capacity gaps.
- d) Initiate capacity development activities to build or strengthen coherent approaches to climate change adaptation and disaster risk reduction.
- e) Design joint project initiatives that address both climate change adaptation and disaster risk reduction.
- f) Conduct adaptation planning with a multi-sectoral, development-based approach and centralised oversight responsibility.

In addition to the benefits of combining CCA and DRRM, both benefit from bringing together other relevant sectors and policies, such as planning, finance, health, land use, environment, agriculture, water, education, and social protection.<sup>51</sup> As well as increasing extreme weather events, “risk is increasing due to development processes that expose more people and assets to climate-related hazards faster than countries are able to reduce their vulnerabilities.”<sup>52</sup> CCA must therefore both influence development planning to reduce this exposure, while reducing and managing the risks related to increasing extreme weather events.

DRRM is well suited to this task, as it already has a role in both development planning and reducing and managing risk related to extreme weather events. However, more needs to be done to

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<sup>47</sup> Stern Review, [Report on the Economics of Climate Change](#) (2006), page vi

<sup>48</sup> Multihazard Mitigation Council (2017) [Natural Hazard Mitigation Saves 2017 Interim Report: An Independent Study – Summary of Findings](#), Principal Investigator Porter, K.; C.M. Shreve, I. Kelman, [Does mitigation save? Reviewing cost-benefit analyses of disaster risk reduction](#) International Journal of Disaster Risk Reduction (Volume 10, Part A, December 2014)

<sup>49</sup> UNDRR, [Adaptation to Climate Change by Reducing Disaster Risks: Country Practices and Lessons](#) (November 2009), page 4

<sup>50</sup> UNDRR, [Adaptation to Climate Change by Reducing Disaster Risks: Country Practices and Lessons](#) (November 2009), pages 9-10

<sup>51</sup> UNDRR, [Adaptation to Climate Change by Reducing Disaster Risks: Country Practices and Lessons](#) (November 2009), pages 9-10

<sup>52</sup> UNISDR, [Strengthening climate change adaptation through effective disaster risk reduction](#) (2010)

coordinate and combine these initiatives with CCA to help garner broader support for each, while avoiding unintended consequences through contradictory or conflicting initiatives.<sup>53</sup>

In addition, where states are not able to adapt to certain adverse impacts of climate change, they will need to consider DRR measures employed in the face of risk that cannot be sufficiently (or cost-effectively) mitigated, such as insurance and catastrophe risk pools/bonds.<sup>54</sup>

The Paris Agreement, for example, notes the importance of reducing the risk of loss and damage, and in particular the importance of “comprehensive risk assessment and management, risk insurance facilities, climate risk pooling and other insurance solutions”.<sup>55</sup>

Finally, it is important to note that both DRRM and CCA are continuous processes. While DRRM regularly includes feedback loops and opportunities to learn from previous experiences, such mechanisms are not yet as well established in CCA.<sup>56</sup> A significant benefit of adopting a DRRM-informed approach to CCA is therefore the opportunity to leverage these continuous learning DRRM practices to improve CCA practice.

Applying these principles in the Republic of Mauritius, the policies, mechanisms and technical procedures of assessing risk generated by natural hazards, other types of hazards and climate change impacts need to be reviewed together given that there is significant overlap of causation and consequence as well as approaches to mitigation and post impact recovery. Economies in funding and resource use as well as more comprehensive management in depth may be achieved.

Agreement also must be reached on what constitutes a “risk” and a “disaster”. For example, threats to fish populations through ocean warming (along with other causes) is considered by some stakeholders as a disaster risk but not by others. Sectoral efforts across DRRM and CCA need to be reviewed for their consistency in policy and programming.

Disasters related to natural hazards, such as large storms or cyclones leading to (i) flooding, (ii) marine inundation and (iii) landslides, have severe impacts on land. These are going to be more frequent and/or intense due to climate change. In this respect, integrating disaster risk considerations in the land use plan formulation process may require a large cross-sectoral approach while assessing the vulnerability of all assets and services (people; goods; infrastructure; human activities such as agriculture, fishery, tourism, and trade; social, cultural, and educational activities; transport; storage of energy and food; water and sanitation, etc).

The three challenges for the land use policy will be: (i) protecting hazard-prone and environmentally sensitive areas, (ii) reducing disaster risk in development that has already encroached onto hazard-prone areas, and factoring in future alternative land use options, and (iii) promoting development in areas not prone to hazards, through regulations and incentives.

In addition to land use planning, the activities on land are managed – such as agriculture, integrating water resources management (at water catchment level), and coastal zone management – can also be a way to reinforce natural ability/capacity to provide nature based solutions to reduce risk and increase resilience.

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<sup>53</sup> IPCC, [AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability](#) at 15.3.2, page 882

<sup>54</sup> UNISDR, [Strengthening climate change adaptation through effective disaster risk reduction](#) (2010), page 5

<sup>55</sup> Paris Agreement, Article 8.

<sup>56</sup> IPCC, [AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability](#) at 15.3.2, page 882

## 3. Disaster Risk Reduction and Management System in the Republic of Mauritius

### 3.1 Key Legal Authorities Governing Disaster Risk Reduction and Management

#### 3.1.1 National Disaster Risk Reduction and Management Act

Disaster risk reduction and management in the Republic of Mauritius takes place under the authority of the National Disaster Risk Reduction and Management Act 2016 (hereafter, the NDRRM Act). The NDRRM Act is supplemented by elements of the Police Act 1974, which defines the powers of the Mauritius Police Force which can be used in a disaster, and the Mauritius Fire and Rescue Service Act 2013, which defines the roles and responsibilities of the Fire and Rescue Service in the case of an emergency.

#### 3.1.2 Additional Acts

Key additional Acts linked to disaster risk reduction and management include:

- a) The Mauritius Red Cross Act 1973, in relation to the disaster risk reduction, warning, response and recovery.
- b) The Civil Aviation Act 1974, in relation to the safe operation of aircraft and related facilities.
- c) The National Coast Guard Act 1988, in relation to safety of lives at sea, search and rescue, and maritime pollution.
- d) The Environment Protection Act 2002, in relation to natural hazards, development, spills, and environmental emergencies. This Act defines environmental emergencies and identifies planning and response actions through the National Environment Commission.
- e) The Planning and Development Act 2004, in relation to sustainable development which incorporates disaster risk reduction.
- f) The Merchant Shipping Act 2007, in relation to the safety of ships and safety and rescue while at sea.
- g) The Building Control Act 2012, in relation to hazardous buildings.
- h) The Land Drainage Authority Act 2017, in relation to flood risk management.
- i) The Mauritius Meteorological Services Act 2019, in relation to warning and alert of severe weather and tsunami warning.
- j) The Quarantine Act 2020, in relation to the need to address the spread of communicable disease.

### 3.2 Organisational Structure

#### 3.2.1 Overview

The NDRRM Act defines a disaster risk reduction and management structure which reaches from the national to local levels, including nine districts in Mauritius, Rodrigues and the Agaléga and Cargados Carajos Shoals (St Brandon). The structure operates in two modes:

- Normal, where the focus is on preparedness and risk reduction, and
- Crisis, where the focus is on warning and alert, response and recovery.

The apex authority for disaster risk reduction and management in the Republic of Mauritius is the Prime Minister. The Prime Minister is supported by a national-to-local structure which covers policy development and implementation, coordination, warning, preparedness, response, recovery and disaster risk reduction (which includes Rodrigues, the Agaléga and Cargados Carajos Shoals (St Brandon)). This structure is set out in the figure below and summarised in the following sections. Additional details can be found in the NDRRM Act.

### 3.2.2 Normal Situation

In normal (non-crisis) conditions, the National Disaster Risk Reduction and Management Council, composed of a wide range of stakeholders, sets and monitors broad risk reduction and management policy objectives leading to a *culture of safety and resilience to disasters*. The Council is responsible for a National Disaster Risk Reduction and Management Policy and overseeing implementation of the National Strategic Framework and a National Action Plan. The Council is chaired by the Minister responsible for disaster management and reports to the Prime Minister.

The Rodrigues Disaster Risk Reduction and Management Council (RDRRM Council) performs the same functions for Rodrigues. The RDRRM Council reports to the Chief Commissioner of the Rodrigues Regional Assembly, who reports to the Prime Minister.

At the national level, the Council works through the National Disaster Risk Reduction and Management Centre (NDRRMC). The Rodrigues Disaster Risk Reduction and Management Centre (RDRRMC) supports the RDRRM Council. Further details on the NDRRMC are provided in Section 3.3, below.

Local Disaster Risk Reduction and Management Committees (LDRRMCs) exist at the local level of government (e.g., District, Cities, Municipalities) and operate under the supervision of the NDRRMC and following the guidance of NDRRM Council. LDRRMCs are the front-end of risk reduction and management and directly engage in efforts with at-risk populations through planning, drills and other activities. Disaster management coordinators responsible for Agaléga and Cargados Carajos Shoals (St Brandon) report to the General Manager

### 3.2.3 Crisis Situation

In crisis conditions a National Crisis Committee (NCC) is established under the Minister responsible for disaster management and is composed of core response and recovery stakeholders. The NCC ensures preparedness plans are implemented as required, defines measures necessary to save lives and property, and supervises response and initial recovery.

The NCC is supported by the multi-agency National Emergency Operations Command (NEOC) and includes members from the public and private sectors. The NEOC is headed by the Commissioner of Police and coordinates and monitors all response and recovery operations. The NDRRMC ensures the administrative and operational functioning of the NEOC. A Disaster Response Unit within the Special Mobile Force assists the NEOC and Local Emergency Operations Command (LEOC).

As indicated in Figure 6 below, the NEOC works directly with the LEOC, the REOC for crises affecting Rodrigues, and the Outer Islands Development Corporation for crises affecting Agaléga and Cargados Carajos Shoals (St Brandon). The NEOC also engages with the *Plate-forme d'intervention Régionale de l'Océan Indien* (see Box 4, below) and other external assistance providers. The Mauritius Red Cross Society is engaged with the NEOC and LEOC as circumstances require.

As required, the NEOC coordinates with the Police Information and Operations Room, the Police Main Command and Control Centre (Safe City Project), the Mauritius Fire and Rescue Service

Control Room and the LEOCs. LEOCs coordinate with the District Operation Coordination Room as well as the local Fire Stations.

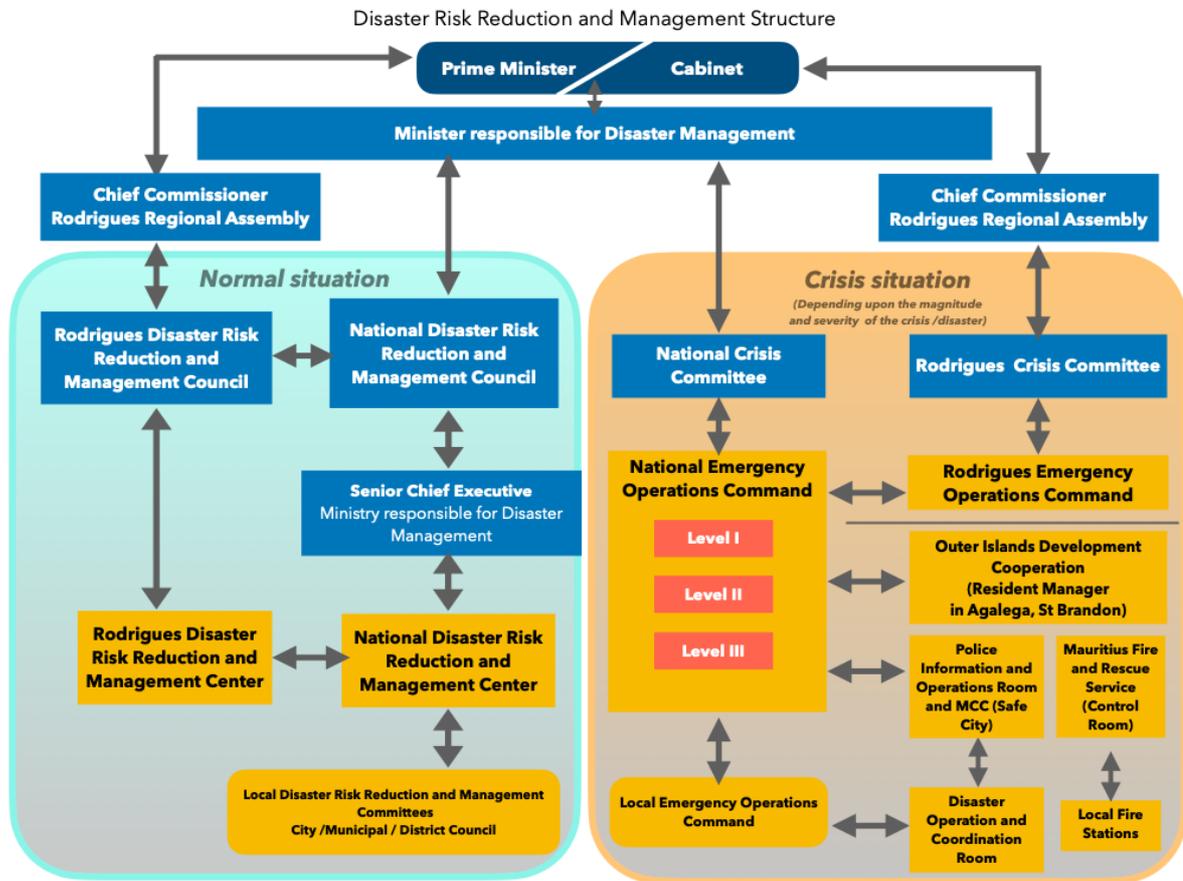


Figure 6: DRR and management operational structure in Normal Situation and in Crisis Situation

In Rodrigues, the Rodrigues Crisis Committee (RCC) oversees the work of the Rodrigues Emergency Operations Command (REOC). The REOC is supported by elements of the Police Force and Fire and Rescue Service based in Rodrigues.

The scale of operations of the NEOC are defined by crisis levels:

- Level I: Monitoring of situation by NDRRMC.
- Level II: Monitoring by NDRRMC staff assisted by representatives of the main first responders.
- Level III: Full scale activation with designated NEOC Members.

The same sequence of monitoring and activation exists for the REOC on Rodrigues.

### 3.3 National Disaster Risk Reduction and Management Centre

The National Disaster Risk Reduction and Management Centre is the lead institution for disaster risk reduction and management in the Republic of Mauritius. The NDRRMC:

- a) Facilitates implementation of the National Strategic Framework and National Action Plan.
- b) Coordinates and monitors all disaster risk reduction and management activities, including engagement with communities and other stakeholders.
- c) Coordinates public education, training, research, lessons learned, and drills related to disaster risk management.
- d) Supports warning and alert efforts.

- e) Supports the NEOC.
- f) Supports international cooperation related to disaster risk reduction and management.

The organisational structure for the NDRRMC is provided in Figure 7, below. The NDRRMC is led by a Director General and divided into three functional areas:

- a) Preparedness, covering education, training, community mobilisation and local community support;
- b) Response, covering information management, warning and alert and support the NEOC; and
- c) Recovery, covering engineering and socio-economic issues.

Local Disaster Management Coordinators are assigned at Local Authority level in Mauritius island and officers are assigned to Agaléga and Cargados Carajos Shoals (St. Brandon). A meteorologist, as well as staff from the Police (through ad hoc arrangements), are assigned to the NDRRMC.

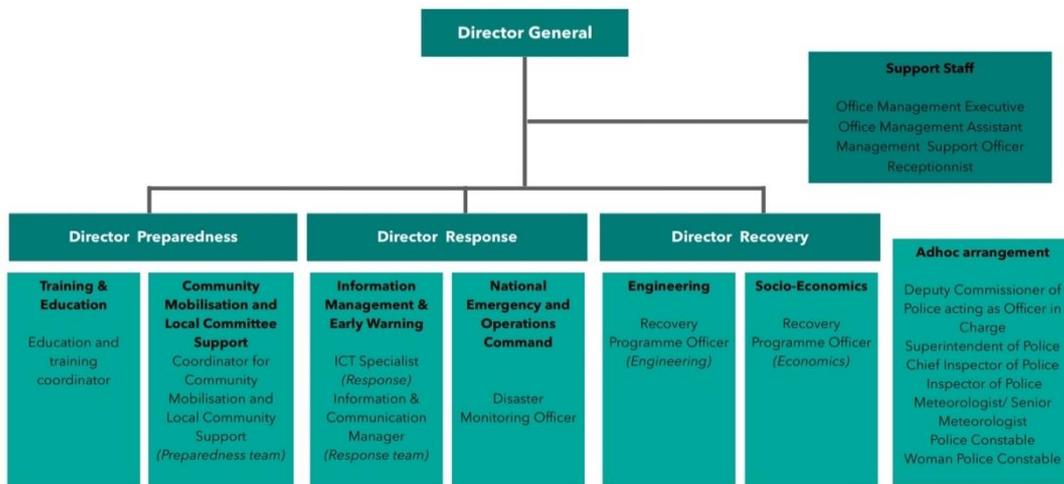


Figure 7: National Disaster Risk Reduction and Management Centre Structure

• ICT: Information and Communication Technology

### 3.4 International Cooperation on Disaster Risk Reduction and Management

International cooperation is particularly important for the Republic of Mauritius due to its geographical isolation. Through membership in the Southern African Development Community (SADC), the Republic of Mauritius has access to the SADC Standby Force.

The Republic of Mauritius is party to a regional oil spill response plan for the western Indian Ocean. In addition, the Republic participates in formal regional cooperation on the safety of lives at sea and coordinating search and rescue operations for aircraft. These arrangements provide formal mechanisms by which the Republic of Mauritius can render and receive assistance during oils spills, air or maritime disasters.

Mauritius is part of the Indian Ocean Tsunami Warning and Mitigation System developed after the 2004 Boxing Day tsunami event. The focal point for the warning system is the Mauritius Meteorological Services.

#### | Box 4: Mauritius Red Cross Society and the Plate-forme d'intervention Régionale de l'Océan Indien (PIROI) |

Established under the Mauritius Red Cross Society Act in 1973, the Mauritius Red Cross Society is an independent and autonomous voluntary organisation working as an auxiliary to the Government in disaster risk reduction and management. The Mauritius Red Cross Society is a member of the National Disaster Risk Reduction and Management Council and the National Emergency Operations Command as well as being present at the local government level.

The Mauritius Red Cross Society is part of the *Plate-forme d'intervention Régionale de l'Océan Indien* (PIROI), which supports Red Cross and Red Crescent societies in the western Indian Ocean on disaster risk reduction and management. Mauritius Red Cross can access international support through PIROI from the International Federation of Red Cross and Red Crescent Society members and other partners.

## 4. Framework Guidance

### 4.1 Overview

The National Strategic Framework is shaped by several national, regional and global policy documents and commitments. These are summarised in this section, with links provided to the full documents where appropriate.

### 4.2 Mauritius Vision 2030

The [Mauritius Vision 2030](#) lays out how the country will build on historic strengths and become a high income country before 2030. The Vision 2030 focuses on building bridges across the Indian Ocean and globally. This process involves (1) Increasing investments in and through the Republic, (2) Increased engagement in renewable and clean energy, promoting innovate technology and (3) All-inclusive growth. Achieving this vision requires a reduction in the current and emerging risks faced by the country and reducing damage when disasters do occur.

### 4.3 Pursuing Our Transformative Journey: Three Year Strategic Plan 2018/19-2020/21

Disaster risk management efforts across the Pursuing Our Transformative Journey: Three Year Strategic Plan 2018/19-2020/2021 are listed below. One of the top ten priorities under the [Strategic Plan 2018/19-2020/2021](#) is to turn flood prone areas into flood free areas.

- a) Implementing a disaster risk reduction and response strategy
- b) Improving the accuracy of weather forecasts
- c) Enhancing the National Multi-Hazards Emergency Alert System
- d) Disaster risk management-related mapping
- e) Obtaining real time data on flash flood prone and vulnerable areas
- f) Enhancing flood response
- g) Enhancing the safety and security of tourists
- h) Improving the performance of aircraft fire and rescue services
- i) Improving phytosanitary controls
- j) Enforcing fire safety statutes for high risk premises

- k) Gender mainstreaming and protecting the rights of children
- l) Education and awareness
- m) Monitoring and Evaluation

The Strategic Plan 2018/19-2020/2021 also anticipates that Local Authorities will have significant involvement in the construction and maintenance of drains across the islands.

#### 4.4 National Disaster Risk Reduction and Management Policy

The **National Policy** defines the broad direction of efforts to manage and reduce the risk posed by disaster to the Republic of Mauritius and sets the context for the National Strategic Framework. The National Policy states that:

*Disaster impacts should be proactively reduced to the lowest levels possible with available local and external resources.*

This policy is broad-based and considers the multiple risks, hazards and vulnerabilities faced by the Republic of Mauritius.

The National Policy anticipates continued improvement in the resilience of the Republic of Mauritius to disasters. The policy envisions the reduction of risk as an integral part of the development process. Disaster preparedness, multi-hazard early warning and alerting are critical to reducing or avoiding impacts when disasters threaten. Effective and timely response and recovery reduce immediate damage, facilitate a rapid return to normal and incorporate measures to reduce future risks. The **National Policy** anticipates broad and shared engagement, from individuals in the Republic of Mauritius to organisations based outside the country, to reduce disaster risk and improve the management of disasters.

#### 4.5 Intended Nationally Determined Contribution for the Republic of Mauritius

The [Intended Nationally Determined Contribution for the Republic of Mauritius](#) sets out plans developed by the Republic of Mauritius to address the impacts of a changing climate. Included in these plans are:

- a) Development of a disaster risk reduction strategy;
- b) Protection of infrastructure from climate-related impacts;
- c) Improved coastal zone management;
- d) Improved marine and terrestrial resilience;
- e) Improved health sector climate-related alert and response mechanisms; and
- f) Use of integrated pest and disease management, including attention to the disposal of pesticides.

The Republic of Mauritius is in process of updating and reviewing its Nationally Determined Contribution in accordance with Article 4 of the Paris Agreement. The review will help establish new emission reduction and adaptation targets for the Republic.

#### 4.6 National Climate Change Adaptation Policy Framework

The [National Climate Change Adaptation Policy Framework for the Republic of Mauritius](#) includes an objective focusing on reducing the loss of life from climate change impacts and reducing impacts on settlements and infrastructure. The National Adaptation Policy discusses disaster risk reduction across sectors (e.g., tourism, agriculture) and identifies specific actions to address flooding and coastal inundation, in both cases using structural and non-structural measures.

### 4.7 Sendai Framework for Disaster Risk Reduction

The [Sendai Framework for Disaster Risk Reduction](#), endorsed by the UN General Assembly, sets out four globally agreed priorities for disaster risk management through 2030, as summarised in Figure 8, below. The Sendai Framework provides a broad outline for efforts to reduce disaster risk, with each country adapting the priorities, actions and indicators to their respective disaster risk context. The National Policy, National Strategic Framework and National Action Plan all serve to integrate the Sendai Framework into the process of disaster risk reduction and management in the Republic of Mauritius.



Figure 8: Sendai Framework for Disaster Risk Reduction

### 4.8 Agenda for Humanity

In 2016, the global community met at the [World Humanitarian Summit](#) to set an agenda for improving humanitarian response. The result was the [Agenda for Humanity](#) which focuses on five core responsibilities (see Figure 9, below). These responsibilities were accompanied by [24 transformations](#) in the way that humanitarian assistance is to be provided.

Figure 9: Five Core Responsibilities of the Agenda for Humanity



The Republic of Mauritius' level of economic and social development makes it less likely to require the type of humanitarian assistance discussed at the World Humanitarian Summit. However, very large scale disasters, or disaster which fall significantly outside the Republic's management capacities, may lead to the country receiving humanitarian aid.

The Republic has a right to this aid in keeping with the responsibilities and transformations set out in the Agenda for Humanity. In addition, attention to the fourth responsibility, to shift from delivering aid

to ending needs, corresponds to priorities three and four of the Sendai Framework: “reducing risk before disasters” and “incorporating risk reduction into response and recovery”.

## 4.9 International Health Regulations

The [International Health Regulations](#), managed through the World Health Organization (WHO), define reporting requirements for communicable diseases considered to be of significant threat to human health. Reporting of the possible development and spread of a disease through the International Health Regulations triggers a global system to mitigate the spread and health impacts of the disease.

Under the International Health Regulations, WHO also works to build national capacities to (1) Detect, (2) Assess and report on, and (3) Respond to the diseases covered by the regulations. This work has led to national health disaster plans and support to detection and analysis as well as development of treatment protocols and skills.

## 4.10 Sustainable Development Goals

The [Sustainable Development Goals](#) inherently involve disaster risk reduction and management. Specific links between the Sustainable Development Goals and the Sendai Framework are summarised in Figure 10, below.<sup>57</sup>

Figure 10: Links between the Sustainable Development Goals and the Sendai Framework



<sup>57</sup> Adapted from <https://www.preventionweb.net/sendai-framework/sdg/target>



Goal 6. Ensure availability and sustainable management of water and sanitation for all.



Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.



Goal 17: Revitalize the global partnership for sustainable development

## 4.11 Paris Agreement under the United Nations Framework Convention on Climate Change

The [Paris Agreement](#) incorporates climate-hazards based disaster risk reduction and management, specifically in:

Article 7 – Adaptation: “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change”.

Article 8 – Addressing Loss and Damage: “averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage”.

Article 12 – Education, Training and Awareness: “enhance climate change education, training, public awareness, public participation and public access to information”.<sup>58</sup>

## 4.12 Convention on the Rights of Persons with Disabilities and Optional Protocol

The Republic of Mauritius is a signatory to the [Convention on the Rights of Persons with Disabilities](#). It is implementing measures, through this National Strategic Framework and the National Policy, to address Article 11 of the Convention related to taking “all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters.”<sup>59</sup>

## 4.13 Agenda 2063 – The Africa We Want

[Agenda 2063](#) is based on the vision of “an integrated, prosperous and peaceful Africa, driven by its own citizens, representing a dynamic force in the international arena”.<sup>60</sup> The first aspiration to attain this vision is “a Prosperous Africa, based on Inclusive Growth and Sustainable Development”. This aspiration is supported by the goal of “environmentally sustainable and climate resilient economies

<sup>58</sup> Extracted from Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, Addendum (2015), United Nations Framework Convention on Climate Change: <https://unfccc.int/sites/default/files/resource/docs/2015/cop21/eng/10a01.pdf>.

<sup>59</sup> Convention on the Rights of Persons with Disabilities and Optional Protocol, <https://www.un.org/disabilities/documents/convention/convoptprot-e.pdf>.

<sup>60</sup> <https://au.int/en/agenda2063/overview>

and communities” and priority engagement on “climate resilience and natural disasters preparedness and prevention”.<sup>61</sup>

#### 4.14 African Union Programme of Action

The [African Union Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa](#) provides guidance and direction for actions by all at the continental, regional, national and sub-national/local levels in Africa to prevent and reduce the risk of disasters in line with the Sendai Framework. The Programme of Action seeks to increase coherence across a range of risk management approaches, strengthen capacities, mainstream gender-sensitive risk management and root causes of risk, use a holistic approach, develop practical tools, and mobilise resources.

#### 4.15 SIDS Accelerated Modalities of Action Pathway

The [SIDS Accelerated Modalities of Action \(SAMOA\) Pathway](#) is one of the blueprint documents for the sustainable development of SIDS. Following its adoption in September 2014, the Republic of Mauritius complied with the requirements thereof.

The SAMOA Pathway is in line with the 2030 Agenda for Sustainable Development. It calls for urgent and concrete actions to address the vulnerabilities of SIDS in a concerted manner. This would sustain the momentum realised by countries like the Republic of Mauritius.

The SAMOA Pathway identifies the need to address disaster risk reduction, the impacts of climate change, drought and the safe handling of hazardous chemicals as key to sustainable development given the particular development challenges faced by SIDS.

### 5. Vision: A safe, adaptive and resilient nation

The vision of a safe, adaptive, and resilient nation sets the path for a country where *residents and non-residents are increasingly safe from hazards and the risk of disaster*. The vision is consistent with the **National Disaster Risk Reduction and Management Policy** for the Republic of Mauritius that “disaster impacts should be proactively reduced to the lowest levels possible with available resources.” Meeting this vision will result in reduced disaster impact and improved livelihoods, health, economic growth, environmental conditions, and social development for the Republic of Mauritius.

This vision is based on an understanding that development must be sustainable. This sustainable development (A) incorporates risk reduction, (B) addresses poverty, (C) assures land and other natural resources are used in a way that reduces risks, and (D) engages eco-system services on land and at sea to reduce and adapt to risks and build natural and social resilience. As a small island state, the Republic of Mauritius needs to be innovative and collaborate across the Indian Ocean and with other states facing similar risks and development challenges.

Achieving this vision requires reducing the risk posed by hazards and continuously strengthening response and recovery for a return to a normal life, economy, and society as quickly as possible after a disaster. The vision is based on the expectation that individuals, families, communities, civil society, the private sector, local authorities, and the government share responsibilities in ensuring everyone can be safe from hazards and reach their individual potential. The vision recognises that risk reduction and management must consider and address how disaster risk impacts vulnerable groups.

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<sup>61</sup> From <https://au.int/agenda2063/goals>

## 6. Core Values

The Framework is based on the following core values:

- a) Clarity with respect to priorities: Giving a clear priority to people based on risk, with specific attention to those who are most vulnerable, those who are in the most hazardous locations, and those who are most likely to experience significant damage and highest costs as a result of disasters.
- b) Commitment: All authorities, directly or indirectly involved, are committed to taking all measures necessary to support people to reduce risks.
- c) Coordination: All DRRM efforts are coordinated to accentuate positive impacts and reduce inefficiencies.
- d) Dedication: All authorities, directly or indirectly involved, are dedicated to taking all actions possible to reduce risks and disaster impacts.
- e) Education and Awareness: Ensuring that everyone at risk of disaster is educated about these risks and aware of how to address and reduce these risks.
- f) Integrity: All parties working on disaster risk reduction and management will demonstrate integrity in all efforts and interactions with people at risk of disasters.
- g) Innovation: The use of technology and innovative solutions, along with their costs and benefits, will be explored whenever possible, to reduce disaster risk and improve management.
- h) Partnership: Authorities responsible, directly or indirectly, for disaster risk reduction and management will work in partnership with each other, civil society, the private sector, and those affected by hazards and disaster risks.
- i) Quality: All services delivered will meet high quality standards.
- j) Recognising uncertainty: Disasters are associated with considerable uncertainties. This is recognised and incorporated into all approaches to disaster risk reduction and management.
- k) Resilience: All disaster risk reduction and management actions, as well as actions towards sustainable development, will enhance resilience.
- l) Responsive: All authorities will respond in a timely manner and in appropriate ways to address threats from natural and technological hazards as quickly as possible through risk reduction, preparedness, warning and alert, response and recovery.
- m) Service: The government and the dedicated teams are committed to be at the service of the population, with a customer-oriented service attitude, responsive manner, and partnership approach.
- n) Shared responsibility: All stakeholders, including those who are at risk, share responsibility to address and reduce disaster risks and prepare for and respond to disasters when they do occur.
- o) Subsidiarity: Ensuring that local government is enabled, in terms of human capacities and resources, to effectively achieve local disaster risk reduction and management in support of individual, family and community efforts.
- p) Solidarity: Reaching from at risk communities to international levels, implementing the Framework is based on assuring and strengthening the solidarity of all parties engaged in disaster risk reduction and management through informal and formal agreements and a sharing of resources within the western Indian Ocean, in South and East Africa, and globally.
- q) Synergy and Cohesion: Using collaboration, cooperation and innovation to increase the cost- and impact-effectiveness of risk reduction, decrease the cost of disasters and improving the societal impact for investment.
- r) Teamwork: Risk reduction and management will be based on teamwork, within organisations and across sectors.
- s) Timeliness: All assistance will be delivered in a timely manner, based on need.

## 7. Strategic Pillars

The strategic pillars of the **National Strategic Framework** are drawn from the four Priorities for Action of the **Sendai Framework for Disaster Risk Reduction 2015-2030** and the five objectives set out in the **Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa** (PoA). These pillars provide a link between global and Africa-region efforts to reduce risk and manage disaster, and the specific efforts in the Republic of Mauritius. Where the Sendai Priorities for Action and the PoA overlap, the respective elements have been combined into a single pillar.

### 7.1 Understanding Disaster Risk through a Risk Culture

Knowledge is the foundation for successful action. This pillar, from the **Sendai Framework**, defines the need to understand the nature of disaster risk for successful risk reduction. All other aspects of this **National Strategic Framework** and **National Disaster Risk Reduction and Management Action Plan** are based on the knowledge represented in this pillar. Understanding disaster risk enables the creation of a risk culture across Mauritian society which incorporates smart management of the natural and anthropogenic threats to make the Republic resilient and less vulnerable.

### 7.2 Strengthening Disaster Risk Governance to Manage Disaster Risk

This pillar, from the Sendai Framework, underpins the policies, procedures and processes through which risk is managed and reduced. The pillar includes the role which local authorities and communities need to play to reduce risks, build resilience, and address disaster impacts. This pillar is strengthened by the **PoA** objective to *strengthen mechanisms, frameworks and capacities at national and sub-national/local levels for mainstreaming, implementing and coordinating gender-sensitive disaster risk reduction strategies and programmes that also address risk drivers, such as poverty, public health, climate change and variability, poorly managed urbanisation, conflict and migration, environmental degradation*. These efforts will consider age, gender, disability, and health status. While conflict is not a significant issue in the Mauritian context, all other aspects of this PoA objective are relevant and must be considered.

### 7.3 Investing in Disaster Risk Reduction for Resilience

This **Sendai Framework** – based pillar supports the process by which financial, material and human resources are invested in building resilience to disasters. Investment is based on a process of systematically incorporating risk assessment (Pillar One results) into the conceptualization, planning, design and implementation of physical construction and social development programmes and projects. This also requires reviewing and revising how risk reduction and management is financed in the Republic.

This pillar is reinforced by the **PoA** objective to *develop practical tools and mobilize resources to contribute to the implementation of DRR programmes and projects*. In addition, this pillar incorporates the PoA objective to *strengthen coherence and integration between disaster risk reduction, climate change adaptation and mitigation, ecosystem management, conflict and fragility, and other development imperatives*. *This is expected to contribute to the implementation and achievement of the goals and aspirations of the Agenda 2063, the Sustainable Development Goals, the Paris Agreement, the Addis Ababa Action Agenda, the New Urban Agenda and the outcomes of the World Humanitarian Summit, including through related instruments, frameworks, programmes and processes adopted by African Union Policy Organs, RECs and Member States.*

This **National Strategic Framework** and the **National Action Plan** are based on generally accepted good practices in disaster risk management, including attention to gender, age and health, and an eco-system-based approach to risk management to support a sustainable future. These practices provide a way forward to increase investment in reduction within overall investment in development.

The Republic of Mauritius is a system of tropical islands highly vulnerable to adverse impacts of climate change and climate variability. The island's environment should not only be considered as a source of risk, but also as a provider of solutions to reduce risks and impacts through the use of nature-based solutions.

## 7.4 Enhancing disaster preparedness for effective recovery, rehabilitation and reconstruction

This pillar, from the **Sendai Framework**, engages the **National Strategic Framework** and **National Action Plan** in a range of actions to ensure that there is adequate preparation for warning, response and recovery, with recovery beginning as quickly as possible after a disaster begins. In keeping with the vision, these efforts should extend from the individual to society at large. Enhancing preparedness requires a continuous process to progressively avoid and reduce the financial costs of disasters and their impacts on the most vulnerable. This process involves improving planning for disasters, warning and alert systems, and response and recovery through a sustainable process of human resource and systems capacity development. Integrated into this pillar is the concept of build back safer and the PoA objective to *embed a holistic approach to systematically incorporate risk reduction measures into design and implementation of disaster preparedness, response and recovery programmes.*

## 7.5 Strengthen long-term capacities, support the implementation of the Africa Regional Strategy for Disaster Risk Reduction and the Sendai Framework and systematically contribute to building resilience to disasters, with a special focus on the most vulnerable groups

This pillar, drawn from the **PoA**, provides a lateral connection between the other pillars, by: (A) Assuring coordination between the Republic of Mauritius, the rest of Africa, and globally; (B) Focusing attention on building resilience through the other strategic pillars; and (C) Ensuring that the most vulnerable are involved in, and benefit directly from, disaster risk reduction and management efforts. These efforts will depend on the regular evaluation of policies and practices and the sharing of lessons within the Republic of Mauritius and with other countries facing similar hazards and challenges. The evaluation process will be through annual reviews of the **National Strategic Framework** and **National Action Plan** as well as reviews at the end of each phase of the **National Action Plan**.

# 8. Strategic Goals

## 8.1 Four Interlinked Goals

The National Strategic Framework encapsulates four interlinked goals derived from the Strategic Pillars:

- Increase the ability to manage risks at individual to societal levels.

- Reduce current levels of risk to as low as reasonably possible.
- Avoid increasing the level of risk due to changes in development or social or economic activities.
- Ensure that preparedness, warning, response, and recovery are as effective and efficient as possible to reduce impacts and facilitate a rapid return to normal.

These goals reflect the policy engagement and application of the National Policy through the National Strategic Framework and National Action Plan. Steps to achieve these goals are outlined in the National Action Plan.

## 8.2 A Shared Responsibility to Achieve the Goals

Achieving these goals is based on a shared responsibility toward disaster risk reduction and management. Individuals are expected to take actions within their means to address and reduce risks and impacts of disasters. Civil society is expected to support efforts by individuals and engage proactively in risk reduction and disaster management when appropriate. The private sector is expected to minimise risks from normal activities and, to the degree possible, contribute to both risk reduction and response and recovery in support of at-risk individuals.

In this shared responsibility, the Government is expected to establish and implement policies and practice which reduce current and future risks and support individuals in their own efforts in these areas. Specific actions by the Government to these ends are detailed in the National Action Plan, Government policies, institutional mandates and operational plans, and supported through Government financing.

# 9. Strategic Objectives

## 9.1 Strategic Objectives to Actions

The National Action Plan sets out 198 actions to achieve the vision and goals of the National Strategic Framework from 2020 to 2030. These actions are grouped under four strategic objectives, as set out below.

## 9.2 Disaster Risk Governance

With respect to disaster risk governance, the strategic objective will be to ensure risk governance systems are enabled to face current and future disaster risks.

## 9.3 Disaster Risk Reduction

For disaster risk reduction, the strategic objective is to progressively reduce disaster risk during the decade to 2030.

## 9.4 Warning and Alert

The strategic objective for warning and alert is to put in operation a multi-hazard, impact-based warning system and effective means of alert by 2030.

## 9.5 Preparedness, Response and Recovery

With respect to preparedness, response and recovery, the strategic objective is to reduce the overall impact of disaster through better preparation and more efficient and rapid response and recovery.

# 10. Implementation

The National Disaster Risk Reduction and Management Strategy Framework will be implemented through a Disaster Risk Reduction and Management National Action Plan for 2020 to 2030. The National Action Plan will identify specific challenges to achieving the objectives set out in Section 9, and define actions, the costs of these actions, indicators, and a timeline for implementation of each task.

The Disaster Risk Reduction and Management National Action Plan will be implemented on a rolling basis, in three periods: (1) 2020-2023, (2) 2024-2027 and (3) 2028-2030. At the beginning of each period, specific objectives derived from the Framework will be confirmed and existing and new projects will be used to achieve these objectives. The rolling implementation process is intended to provide flexibility in achieving goals and allows adjustments to reflect changes in underlying priorities, the understanding of risks and changes in funding opportunities. As set out in Figure 11, disaster risk reduction and management is a holistic and continuous process where interventions take place in a coordinate manner across the pre- and post-disaster landscape.

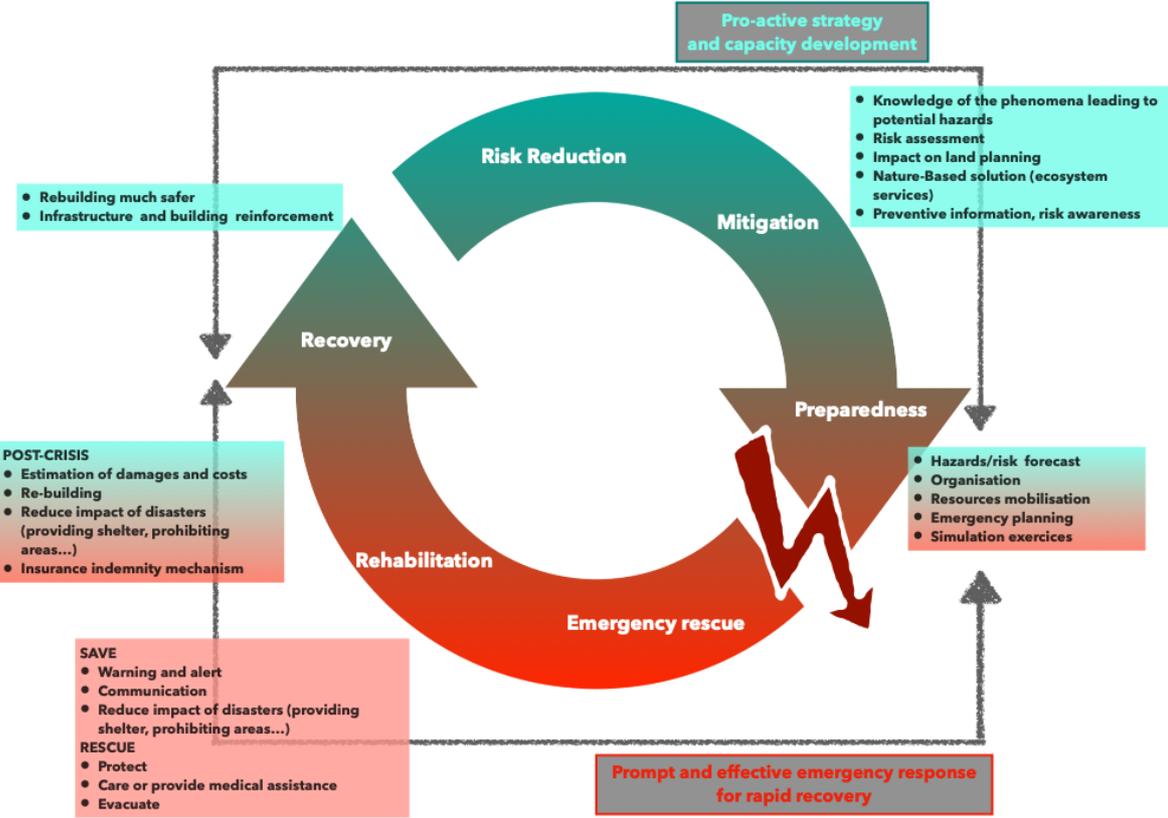


Figure 11: Disaster Risk Reduction and Management: A Holistic and Continuous Process

## 11. Monitoring

Monitoring of the National Strategic Framework and National Action Plan will be managed through the National Disaster Risk Reduction and Management Centre. Progress towards objectives will be measured annually using the indicators set out in the Action Plan.

The National Disaster Risk Reduction and Management Centre will report to the National Disaster Risk Reduction and Management Council annually on progress towards National Strategic Framework goals and implementation of the policy and strategy. The reporting will include recommendations on improving progress, as needed.

## 12. Evaluation

Implementation of the **National Strategic Framework** and the **National Action Plan** will be formally evaluated during 2022, 2026 and 2029 under the direction of the National Disaster Risk Reduction and Management Centre. The 2022 and 2026 evaluations will be used to assess progress towards overall goals and objectives and to adjust implementation plans for the following implementation cycle (2024-2027 for the 2022 evaluation and 2028-2030 for the 2026 evaluation). The final evaluation, to begin in 2029, will be used to assess overall progress towards the **National Strategic Framework** and to identify further requirements to reduce disaster risk and manage disaster impacts in the Republic of Mauritius.

Separate from these three evaluations, specific projects implemented as part of the **National Action Plan** will be formally evaluated on completion. The results of these evaluations will be reported to the National Disaster Risk Reduction and Management Council and used to (1) identify further interventions; and (2) adjust current and future implementation plans to improve results in reducing disaster risk and managing disasters.

## 13. Funding

Funding to implement the **National Action Plan** will be drawn from domestic and international public and private sources. The Ministry responsible for Disaster Risk Management will, through appropriate mechanism, create the necessary enabling environment for budget provisions to be made at the level of each Ministry for implementation of the actions contained in the **National Action Plan** and for each of the three rolling implementation periods. Funding requirements for 2024-2027 and 2028-2030 will be updated annually to reflect progress towards goals.