Introduction to Disaster Risk Financing and CCRIF Parametric Insurance

Prepared by: CCRIF SPC

Ice-breaker

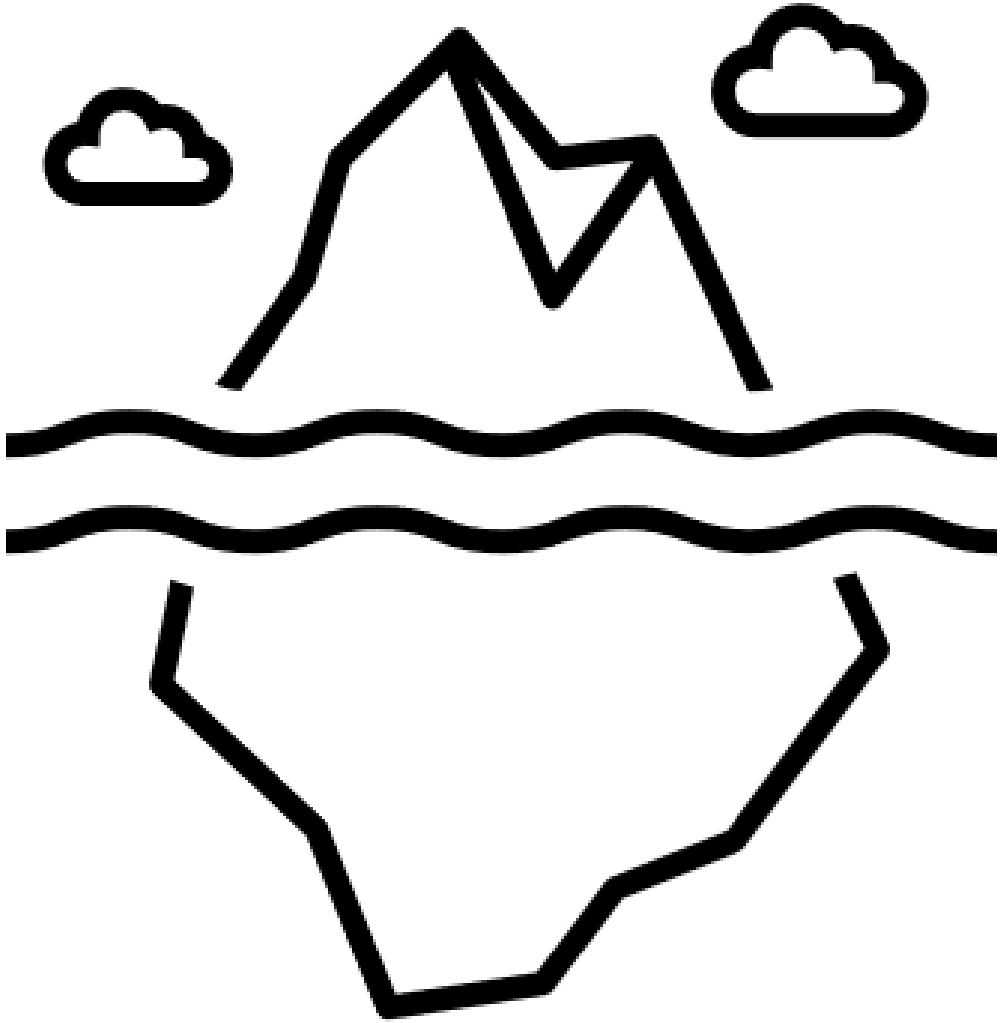
The words we choose to define ourselves can be really telling. Using the chat, use an adjective to describe yourself that starts with your first name…

Lively Liz

Genuine Gina

Loveable Lily

Zesty Zachary



Course Aims/Goals

This course covers the following topics:

- Natural Disasters and the Caribbean Hazard Landscape
- Introduction to Economic Theory
- The Impact of Natural Disasters on the Economy
- The Relationship between Disaster Risk Management and Disaster Risk Financing
- Understanding Disaster Risk Financing
- Disaster Risk Financing Tools
- The Linkages between Insurance and Social Protection Strategy – Case Study on the Climate Risk Adaptation and Insurance in the Caribbean Project (CRAIC)
- Introduction to CCRIF's Parametric Insurance Policies and Models
- Differences between Parametric Insurance and Indemnity Insurance
- CCRIF's Models and Parametric Insurance Policies
- Overview of CCRIF's Country Risk Profiles and Applicability to Development Planning
- Introduction to Integrated Risk Management
- Careers in Disaster Risk Financing and Disaster Risk Management

Some Learning Outcomes

- **On successful completion of the course, learners will be able to:**

  - Understand the linkages between disaster risk management and disaster risk financing
  - Understand ex-ante and ex-post disaster risk financing instruments
  - Better appreciate the importance of both risk transfer and risk mitigation in disaster risk management
  - Understand the importance of closing the protection gap and the linkages with social protection strategies and shock responsive social protection
  - Understand the difference between parametric and indemnity insurance
  - Understand the role of microinsurance in reducing vulnerabilities
  - Understand CCRIF's parametric models that underlie its policies
  - Understand the elements of CCRIF policies
  - Understand how the country risk profiles are used for CCRIF policies and how they can be used for other national uses
  - Understand the role of the WeMAp Tool for monitoring hazard
  - Understand the concepts related to integrated risk management

Structure of Course

Caribbean Hazard Risk Landscape

Disaster Risk Financing

Introduction to CCRIF SPC, CCRIF's Parametric Insurance Policies, Models, Tools and Country Risk Profiles

Shock Responsive Social Protection and DRM and Insurance

Introduction to Integrated Risk Management | Careers in Disaster Risk Financing and Disaster Risk Management

Natural Hazards and the Caribbean Landscape

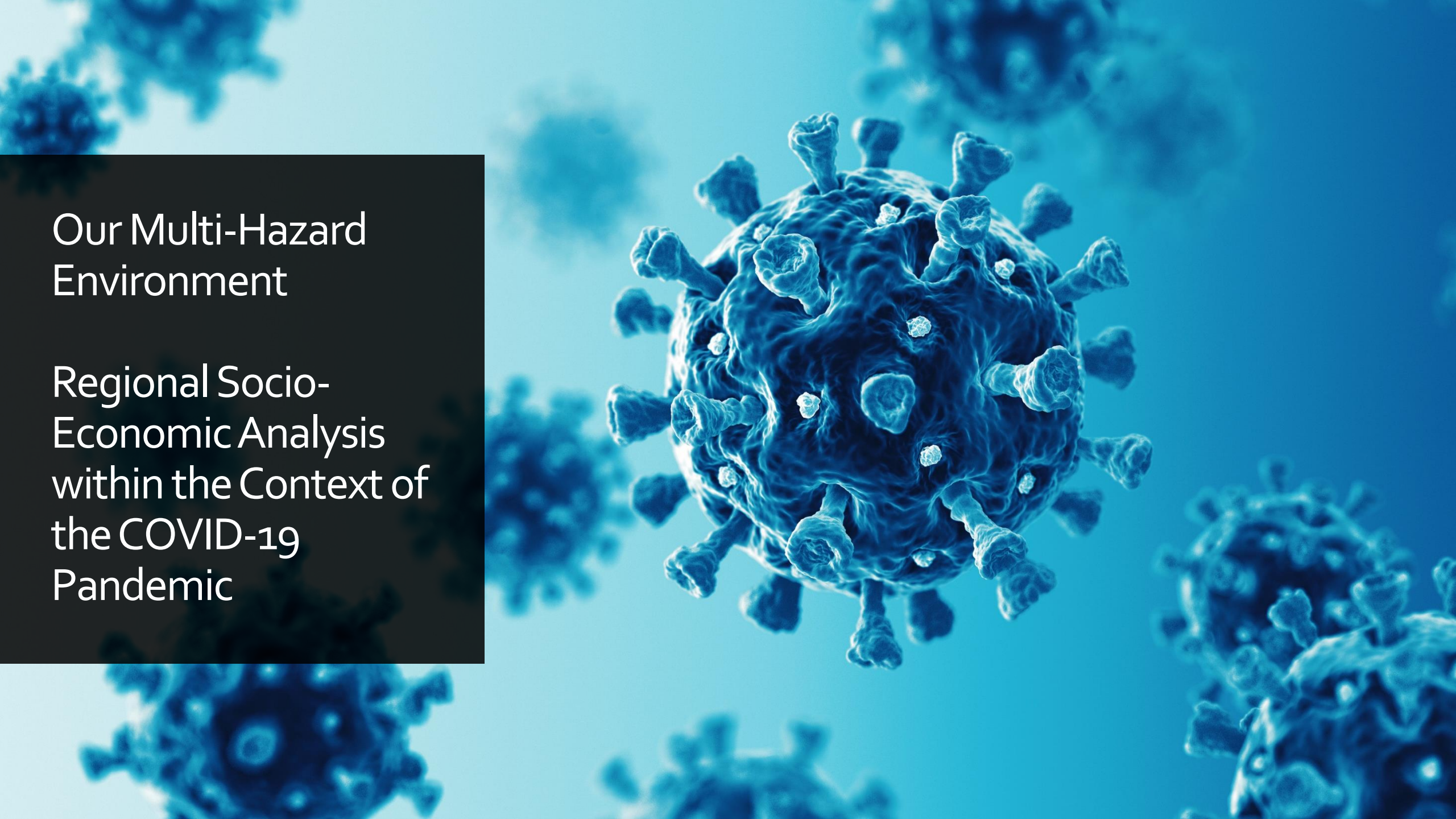
At the end of this Unit, learners should be able to:

Describe	Describe the region's risk profile with respect to natural hazards
Examine	Examine worldwide trends in disaster occurrence, regional distribution, and damages and losses
Define	Define key concepts in disaster management
Examine	Examine Risk Mitigation, Risk Management and the Linkages with Ecosystems Management and the Importance of Financing Risks and Disasters and the key elements of a comprehensive disaster risk management framework
Be	Be able to address how disasters affect economies

The Multi-Hazard Environment

1. What of these hazard types affect your country?
2. Rank each hazard that affects your country according to (economic impact, fiscal indicators), social impact (# of persons affected per 100,000, loss of lives etc.), environmental impacts (loss of ecosystem services
3. Share the top 5

Natural Hazards	Manmade Hazards	Biological/Health Related Hazards
Meteorological and Hydrological: • Tropical cyclones (tropical storms and hurricanes) • Rainfall, including severe rainfall events • Lightning • Extreme heat and increasing temperatures • Floods • Drought • Sea-Level rise **Geohazards:** • Earthquakes • Mud Volcanoes • Tsunamis • Submarine volcanic eruptions **Environmental:** • Land degradation • Coastal erosion/Coastal inundation • Soil erosion • Landslides • Sahara dust • Sargassum • Coral reef degradation	**Chemical:** • Oil spills • Transboundary movement of hazardous materials/ wastes **Technological** • Road, aviation, and nautical accidents • Industrial accidents • Infrastructure Failures • Fires (bush and forest fires) **Societal:** • Fires • Terrorism • Cybercrimes/cyber security • Societal unrest	**Biological:** • Human disease outbreaks, epidemics, pandemics • Animal (livestock) and plant (agricultural) epidemics • Other biological/physical hazards such as poisoning, eutrophication, air pollution



Our Multi-Hazard Environment

Regional Socio-Economic Analysis within the Context of the COVID-19 Pandemic

Impact of COVID-19 – Caribbean and Central America

- Latin America and the Caribbean is the region in the developing world that has been hardest hit by the crisis stemming from COVID-19.
- Putting the health of countries first has come at a high cost
- COVID-19 has resulted in both domestic and external challenges:
  - **revenue and income losses**
  - **rising unemployment**
  - **increased indigence and poverty**
  - **the failure of micro, small and medium sized businesses**
  - **near total shutdown of air and cruise travel, resulting in an immense blow to the tourism sector**
  - **stress in related supply chains (agriculture, construction, hotels, restaurants, entertainment and the culture, cultural and creative)**
  - **a downturn in commodities prices**
  - **the contraction of foreign direct investment (FDI) flows and remittances**
  - **risk aversion for external investors and financial turbulence**
  - **restrictions on foreign exchange availability**
  - **challenges in education due to school closures and lack of access to technology and the internet**
  - **other social issues – food insecurity, food gluts, gender-based violence, social safety nets**
  - **public resources diverted from DRM, CCA, and environmental management for COVID response, further increasing vulnerabilities to natural hazards**

Natural Disasters have crippled Caribbean economies and budgets….

$156

billion

Total damages to the Caribbean
(1970 – 2017)

- Higher fiscal deficits and **public debt** ratios
- Challenges in key **industries**
- Larger **trade deficits**
- Population **migration**

2004 **Ivan**

200%
of Grenada's GDP

2015 **Erika**

96%
of Dominica's GDP

2017 **Maria**

226%
of Dominica's GDP

What are your risks as a country? Defining Risks

- **Risk is a function of three components—hazard, exposure, and vulnerability.**

- ***Hazard:*** the likelihood and intensity of a potentially destructive natural phenomenon, such as ground shaking induced by an earthquake, wind speed associated with a tropical cyclone or rainfall volume for a rainfall event.

- ***Exposure:*** the location, attributes and value of assets that are important to the various communities, such as people, buildings, factories, farmland and infrastructure that are exposed to the hazard.

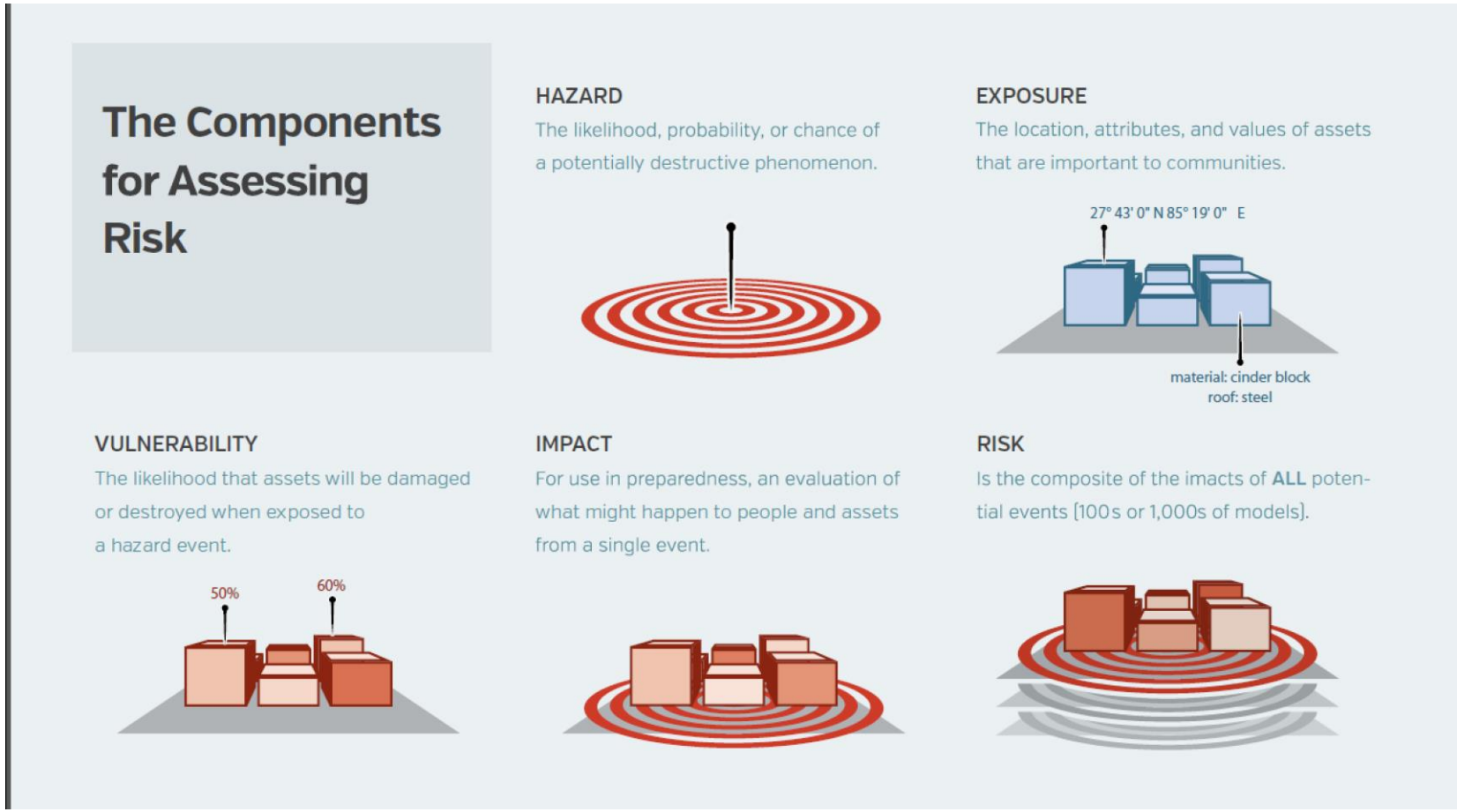
- ***Vulnerability:*** the reaction of the assets when exposed to the forces produced by a hazard event. For example, a building's vulnerability to an earthquake increases with the intensity of ground shaking and decreases with improved conformity to seismic design standards.

Examining the Concept of Vulnerability

- Vulnerability is
  - the condition of the system before it encounters the hazard event
  - the reaction of the assets when exposed to the forces produced by a hazard event

Assessing the Impact of Hazards

- **It is important to emphasize that exposure and vulnerability, not just hazard levels, drive the scale and impacts of any hazard or a hazard becoming a disaster**
- **Based on the assessment of risk, has your responses to the top 5 hazards changed?**



Risk Assessment

- Risk can be calculated using the following equation: **Risk = Probability of Hazard x Degree of Vulnerability**
- There are different ways of dealing with risk, such as:
  - **Risk Acceptance:** an informed decision to accept the possible consequences and likelihood of a particular risk.
  - **Risk Avoidance:** an informed decision to avoid involvement in activities leading to risk realization.
  - **Risk Reduction** refers to the application of appropriate techniques to reduce the likelihood of risk occurrence and its consequences.
  - **Risk Transfer** involves shifting of the burden of risk to another party.
    - One of the most common forms of risk transfer is Insurance.

Risk Assessment

- Disaster risk is the potential disaster losses (in terms of lives, health status, livelihoods, assets and services) which could occur to a particular community or a society over some specified future time period (UNISDR, 2009 NB. Now called UNDRR)

- Focused on both the scientific assessment and the socio-economic impacts of a hazardous event.

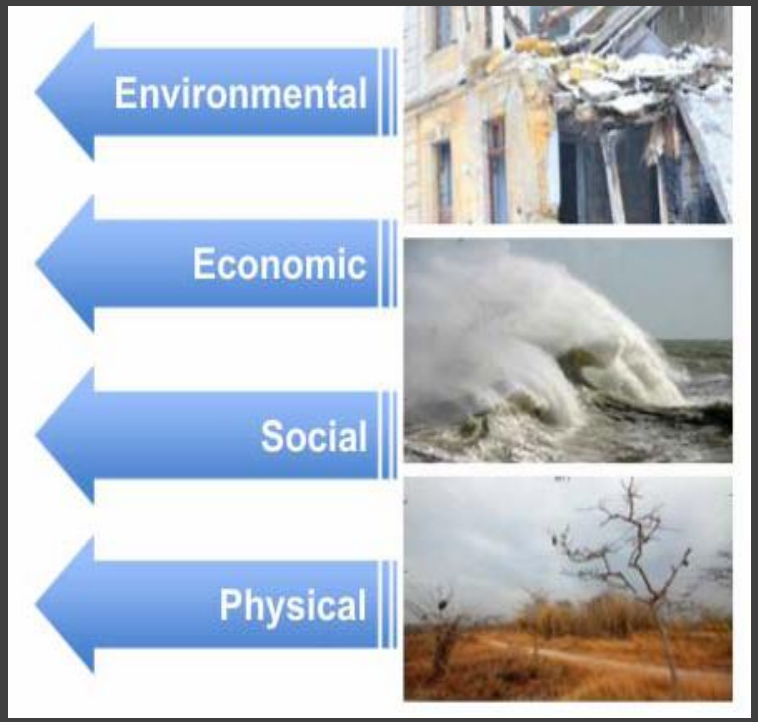
- It involves:
  - Hazard assessment
  - Location of buildings, highways, and other infrastructure in the areas subject to hazards
  - Potential exposure to the physical effects of a hazardous situation
  - The vulnerability of the community to the physical effects of the event

- Question: What is the value of risk assessment?

Risk Assessment

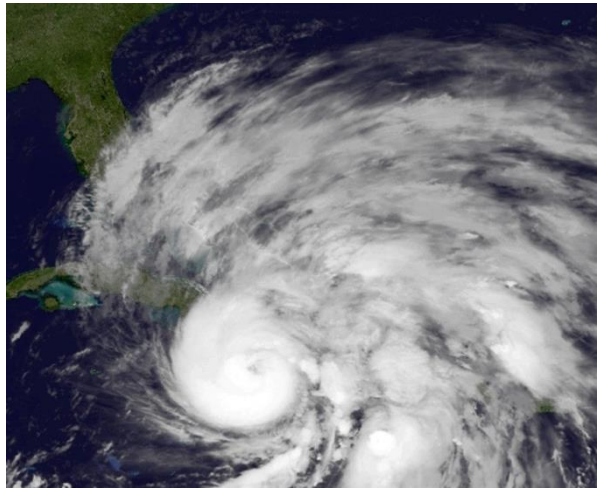
- Disaster risk arises when hazards interact with physical, social, economic and environmental vulnerabilities.

- Examples
- Economic – Agriculture (fisheries, livestock, crops)
- Social- Education, health
- Environmental- sensitivity of wetlands to increase salinity, land degradation, watershed degradation, loss of coral reef
- Physical- poor design and construction of building, population density levels



Natural Hazards and Disasters

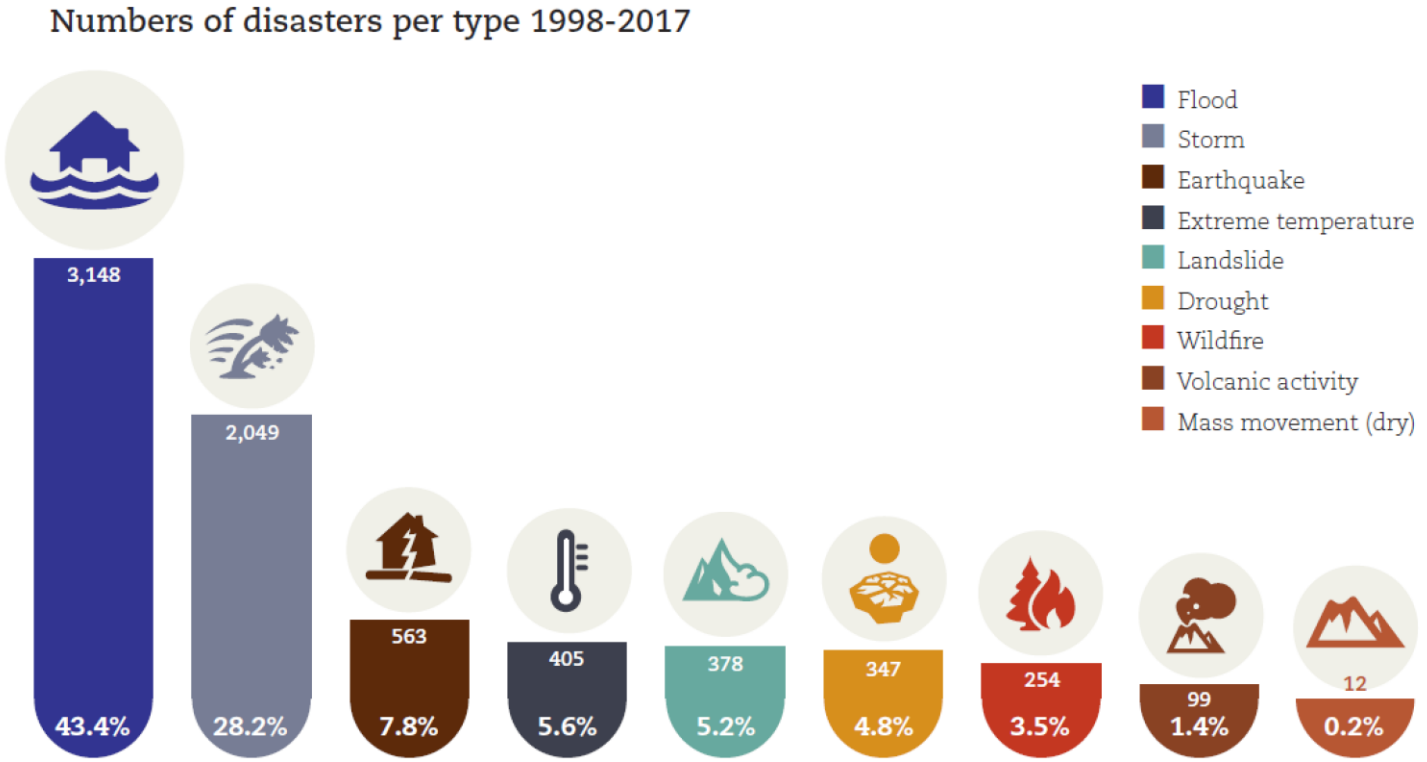
Natural Hazard vs Natural Disaster



Natural hazards are geographical events which occur naturally such as earthquakes, tropical cyclones, volcanoes, as well as periods of excess rainfall (potentially leading to floods) and lack of rainfall (drought)

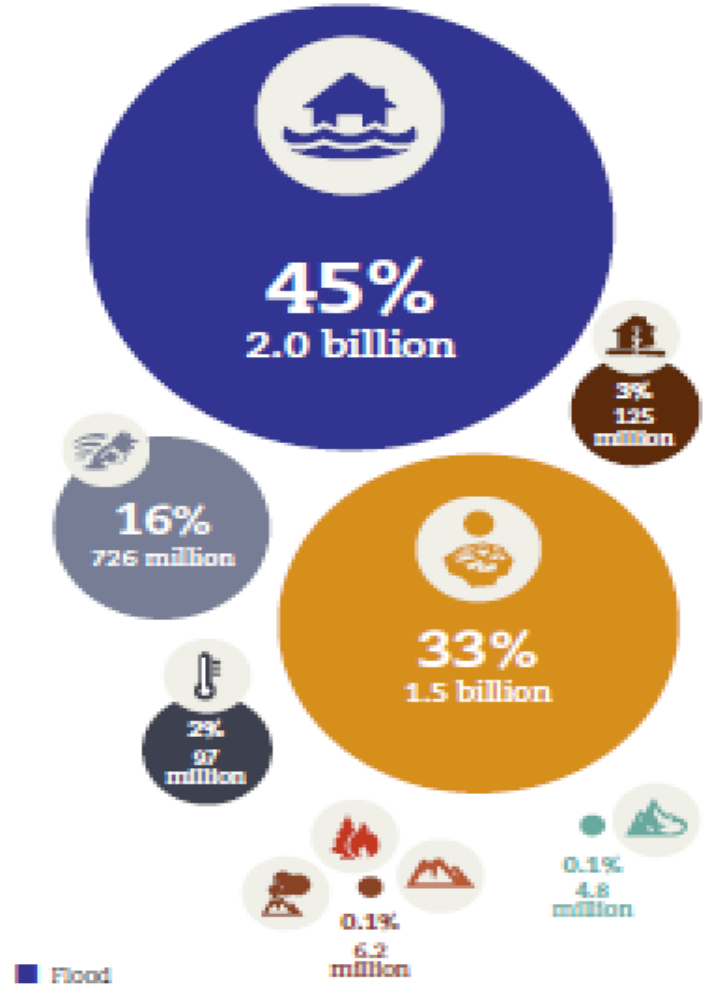
When a natural hazard leads to a significant loss of human life and/or damage to property and/or – environmental damage, then it becomes a natural disaster

Global Context



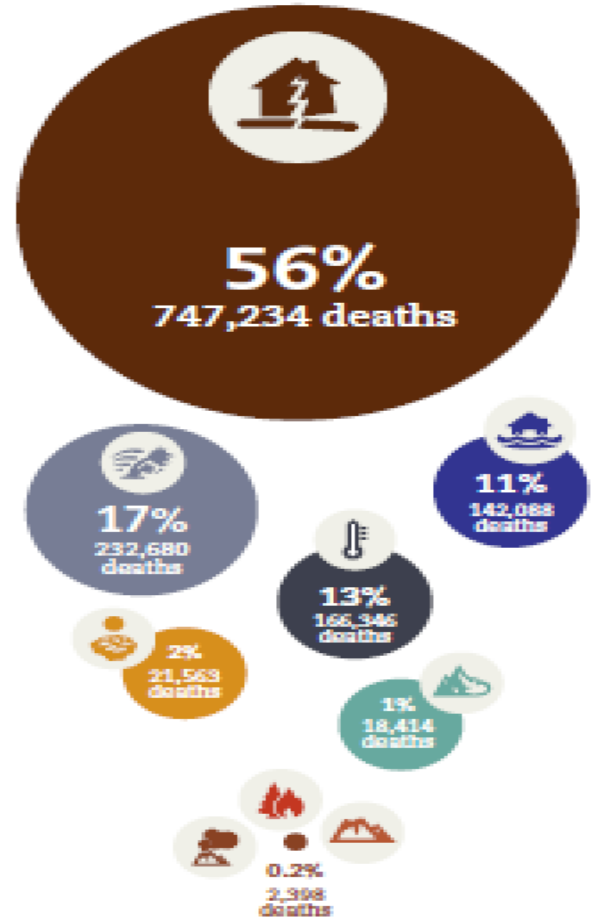
Between 1998 and 2017 climate-related and geophysical disasters killed 1.3 million people and left a further 4.4 billion injured, homeless, displaced or in need of emergency assistance. While the majority of fatalities were due to geophysical events, mostly earthquakes and tsunamis, 91% of all disasters were caused by floods, storms, droughts, heatwaves and other extreme weather events.

Number of people affected
per disaster type 1998-20173



- Flood
- Drought
- Storm
- Earthquake
- Extreme temperature
- Landslide
- Wildfire, Volcanic activity, Mass movement (dry)

Number of deaths
per disaster type 1998-2017



- Earthquake
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- Extreme temperature
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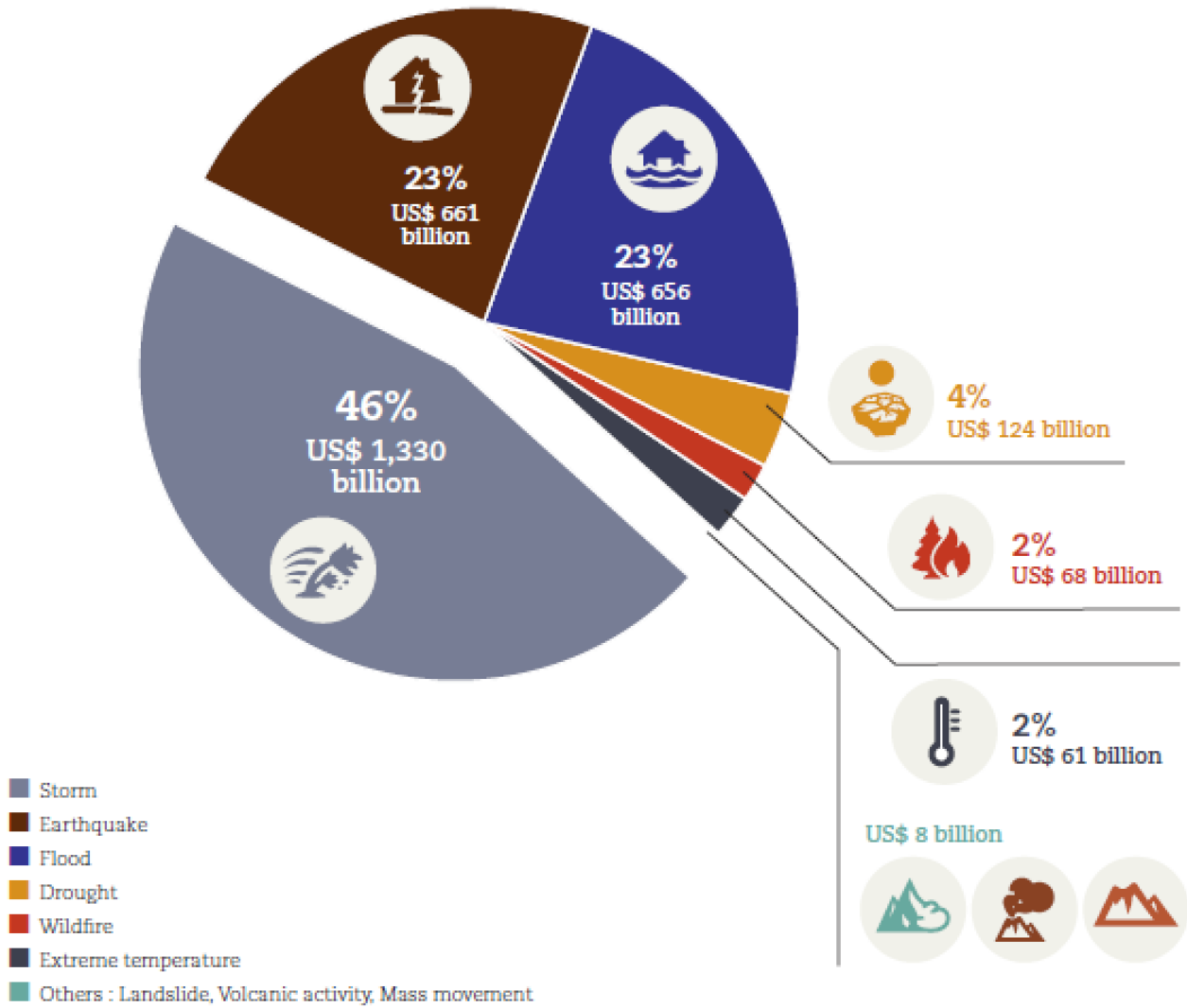
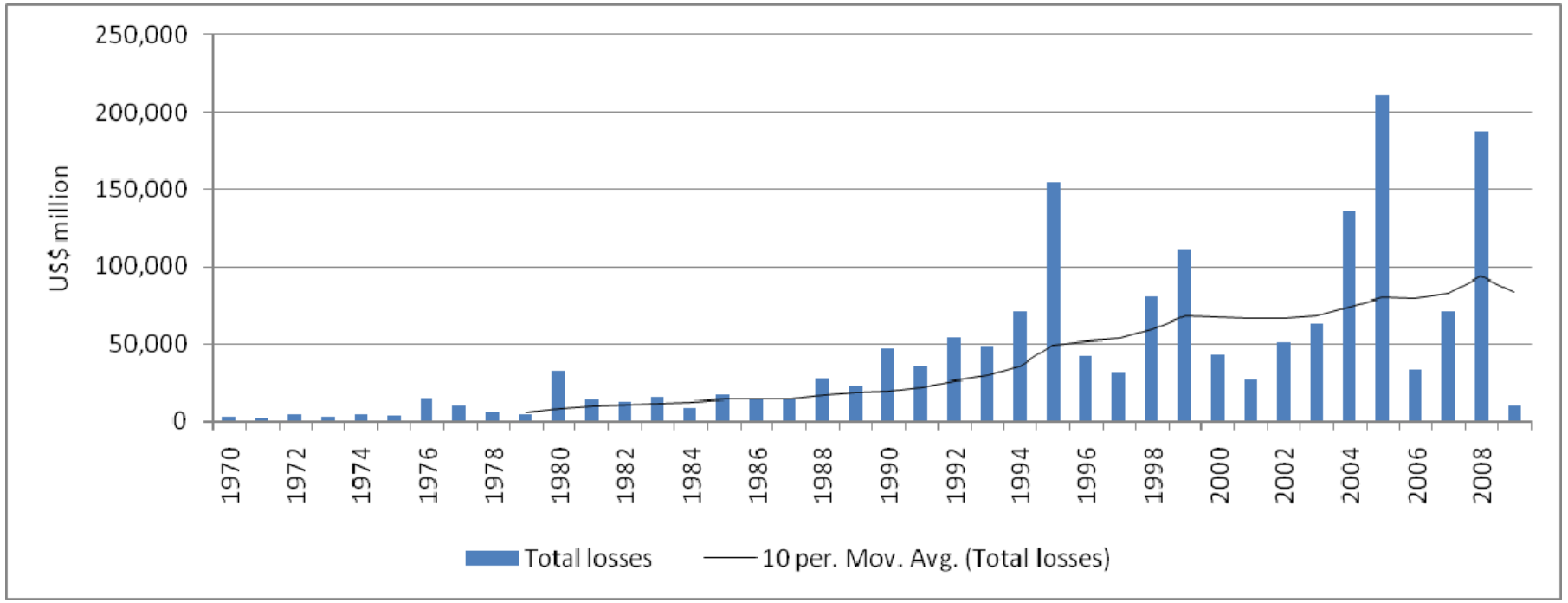
Breakdown of recorded economic losses (US$) per disaster type 1998-2017



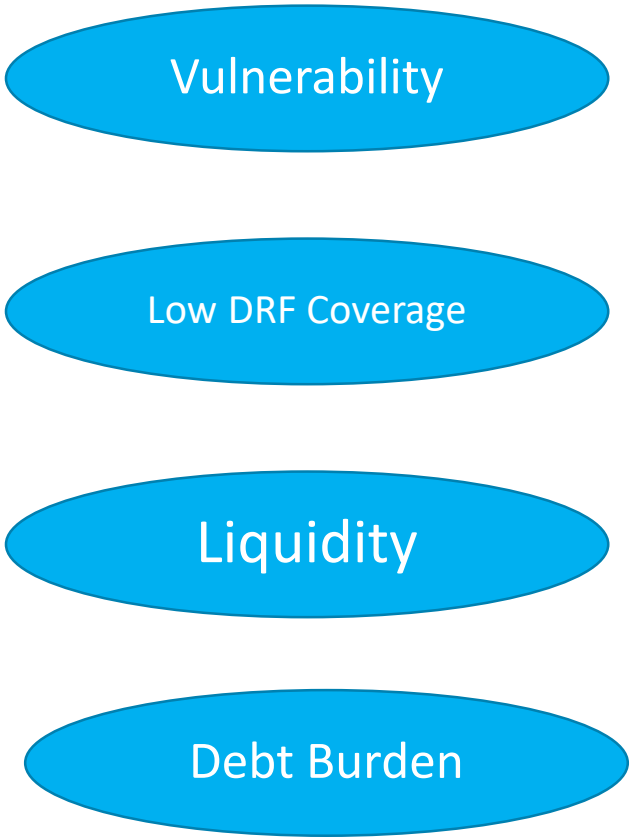
Disaster Losses are Increasing…

- Disaster losses are increasing all over the world.
- The figure presents estimates of damage from natural disasters. This upward trend is principally due to increases in population and assets exposed to adverse natural events, a trend likely to worsen with growing urbanization, environmental degradation and expected increase in the number and intensity of hydro-meteorological events resulting from climate change.



The Impact of Natural Disasters in the Caribbean

- 2017 was a defining moment for the Caribbean after suffering the devastation caused by Caribbean after suffering the devastation caused by two category 5 hurricanes within 14 days of each other. Damage and loss due to these storms has been estimated at approximately US$130 billion and affected 18 countries, including CARICOM member countries.
- So too was September 2019 – Hurricane Dorian – devastation in Abaco and Grand Bahama
- Between 1998 and 2017 all of the top 10 worst affected countries/territories in terms of losses as a percentage of GDP were small Caribbean countries/territories
- Immediate access to liquidity is critical for governments and individuals post disaster



The Impact of Natural Hazards in the Caribbean

- According to Moody's, the average annual damage from natural disasters over 1980-2015 was 1.5% of GDP in emerging markets vs. 0.3% of GDP in developed economies. The average share of affected population over the same period was 3.0% in emerging markets vs. 0.4% in developed economies.

- Among the 20 most vulnerable countries globally, more than half represent small island states across the Caribbean and Pacific Regions. These 20 countries bear average losses between 20.1% and 2.1% of their respective GDP every year. The countries in the Caribbean that are referenced include Belize, Jamaica, The Bahamas, St. Vincent and the Grenadines.

Top 10 climate-related disasters for absolute losses 1998-2017

Name and date	Countries/territories affected	Sum of Total Damages (billion US$)
Hurricane Katrina – Sep.2005	USA	156.3
Hurricane Harvey – Aug. 2017	USA	95.0
Hurricane Irma – Sep.2017	USA & Caribbean Islands	80.8
Hurricane Maria – Sep.2017	Caribbean Islands& USA	69.7
Hurricane Sandy – Oct. 2012	USA & Caribbean Islands	53.5
Flood – July & Aug. 1998	China	44.9
Flood – Aug.2011 to Jan. 2012	Thailand	43.4
Hurricane Ike – Sep.2008	USA & Caribbean Islands	36.3
Hurricane Ivan – Sep.2004	USA, Caribbean Islands & Venezuela	29.9
Hurricane Wilma – Oct.2005	USA, Mexico, Belize, Honduras & Caribbean Islands	25.0

Top 10 climate-related disasters for losses as a percentage of GDP 1998-2017

Name and date	Countries/territories affected	Economic losses (billion US$)	Economic losses (%GDP)
Hurricane Irma – Sep. 2017	Sint Maarten	2.50	797
Hurricane Irma – Sep. 2017	Saint Martin	4.10	584
Hurricane Irma – Sep. 2017	British Virgin Islands	3.00	309
Hurricane Maria – Sep. 2017	Dominica	1.46	259
Hurricane Ivan – Sep. 2004	Grenada	1.15	148
Hurricane Ivan – Sep. 2004	Cayman Islands	4.43	129
Hurricane Georges – Sep. 1998	Saint Kitts and Nevis	0.60	110
Hurricane Erika – Aug. 2015	Dominica	0.50	90
Hurricane Mitch – Oct. & Nov. 1998	Honduras	5.68	73
Hurricane Maria – Sep. 2017	Puerto Rico	68.00	69

Some Other Examples – Caribbean and Central America

Tropical cyclones in 2017 caused losses in the Caribbean estimated at US$93,455 million, the highest level ever reported

Hurricane Ivan in 2004 had a devastating impact on Grenada causing damages valued in excess of 200% of the country's GDP

The average cumulative (1970-2002) damage of natural disasters in the Eastern Caribbean was equivalent to 66% of annual GDP

The 7.0 magnitude earthquake in Haiti in 2010 caused over 300,000 deaths, displaced over three million people and made more than a million homeless

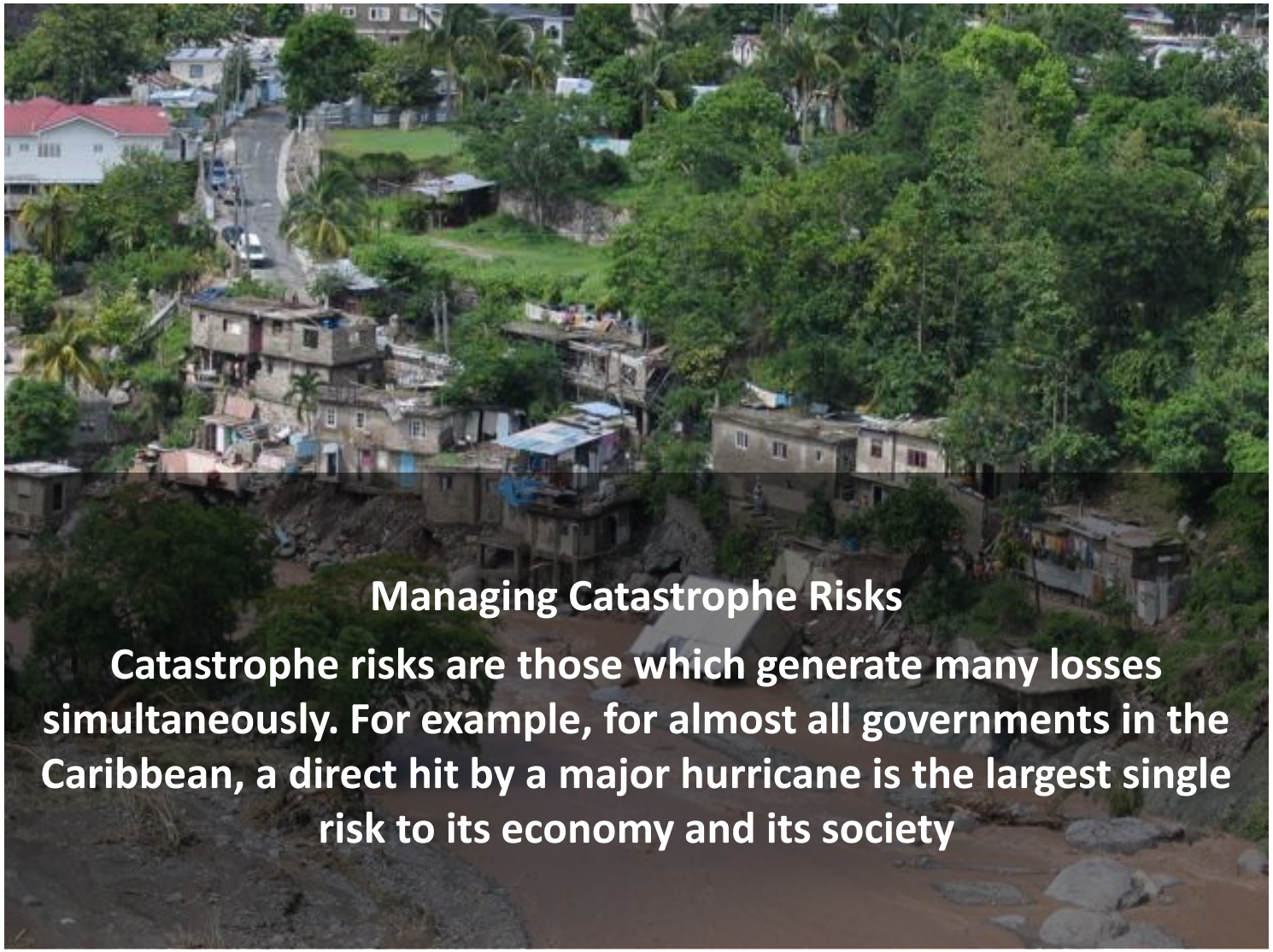
Group Exercise

Prepare a presentation on the impacts of a recent natural hazard event in your country.

Provide 4 factors, natural or man-made that could have contributed to the outcomes caused by the natural hazard. Provide 3 possible solutions that would mitigate against future similar hazards.

Some events:

- La Soufrière Volcanic Eruption
- Hurricane Eta
- Haiti earthquake 2021
- Hurricane Maria
- Heavy rainfall



Managing Catastrophe Risks

Catastrophe risks are those which generate many losses simultaneously. For example, for almost all governments in the Caribbean, a direct hit by a major hurricane is the largest single risk to its economy and its society

Comprehensive Disaster Risk Management (CDRM)

CDRM is an all hazards approach to disaster risk management that focuses on all phases of the DRM cycle (preparedness, response, risk reduction, recovery, and financial protection). CRDM emphasizes taking a holistic, integrated and participatory approach to addressing disaster risk, by the public and private sectors, all segments of civil society and the general population for the purpose of building resilient, safer societies.

International and Regional Frameworks

- 2030 Agenda for Sustainable Development and the Sustainable Development Goals
- Sendai Framework for Disaster Risk Reduction 2015 – 2030
- Hyogo Framework for Action 2005 – 2015
- Paris Agreement on Climate Change 2015
- Addis Ababa Action Agenda of the Third International Conference on Financing for Development (Addis Ababa Action Agenda)
- Caribbean Comprehensive Disaster Management Strategy and Programming Framework 2014-2024
- Regional Framework for Achieving Development Resilient to Climate
- Change

Comprehensive Disaster Risk Management (CDRM)

Risk Identification	• Hazard mapping, risk modelling
Risk Reduction	• Spatial and sectoral planning, sector-specific standards • Risk mitigation works, infrastructural retrofitting, ecosystems management • Education and creating a culture of prevention
Financial Protection	• Budget planning, risk transfer, risk financing instruments (e.g. insurance, contingent credit, cat bonds etc.), budget appropriation
Preparedness	• Alerts and early earning systems, response planning, training, equipment, logistics simulations, response systems management
Recovery and Redevelopment	• Institutional planning, strengthening; recovery, planning, reconstruction policies; rehabilitation plans

Disaster Preparedness *= Disaster risk mitigation + ecosystem management + risk transfer and risk financing + social protection strategies*
(including addressing psychological impact of disasters)

Linking Fiscal Policies with DRM

- Natural disasters and financial crises are typically exogenous events that represent covariate shocks across a country and households
- Economic damages from natural hazards can jeopardize the health of national economies at a level comparable to or greater than that of financial crises
- Natural disasters also destroy human and physical capital stocks of countries – something that financial crises do not

It is becoming increasingly commonplace for governments to consider the inclusion of disaster risk in fiscal policy as this provides an efficient way for countries to financially protect themselves against events that cannot be prevented.

- The increasing frequency and severity of climate extremes has forced governments to consider new ways of meeting the financial consequences of natural disasters, and there is a growing interest in implementing sovereign Disaster Risk Financing and Insurance (DRFI) programmes in an attempt by

- **Climate Change and Disasters**
  - **Climate Change** changes the magnitude and frequency of extreme weather events
  - **Climate Change** changes average climatic conditions and climate variability, affecting underlying risk factors
  - **Climate Change** generates new threats, which a region may have no experience in dealing with

Discussion Activity

- **Question 1**
- What has your country done and is doing to adapt to climate change?

- **Question 2**
- What are you doing?