Overall Framing and Discussion of Expose and Vulnerability

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INTERGOVERNMENTAL PANEL ON climate change

Contents

1. Core concepts: vulnerability, expose, disaster risk
2. The inter-linkages between the core concepts
3. Changes in vulnerability and exposure
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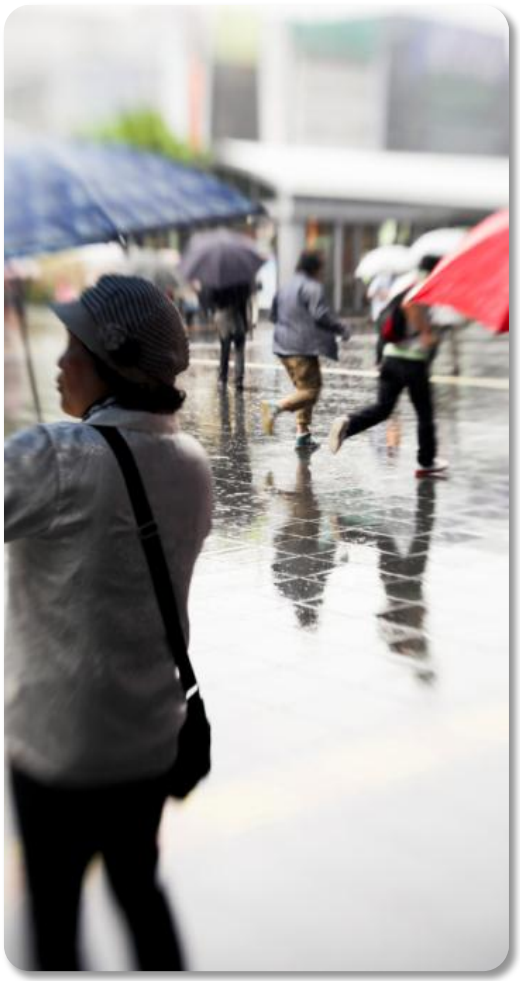
A changing climate leads to changes in extreme weather and climate events



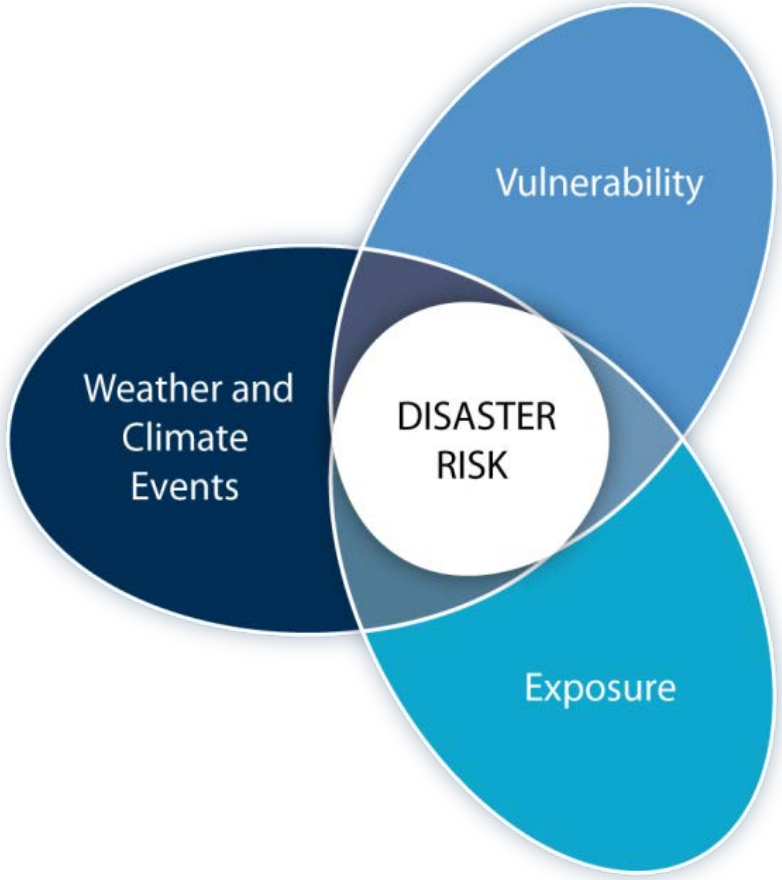
Impacts from weather and climate events depend on:

nature and severity of event

vulnerability

exposure

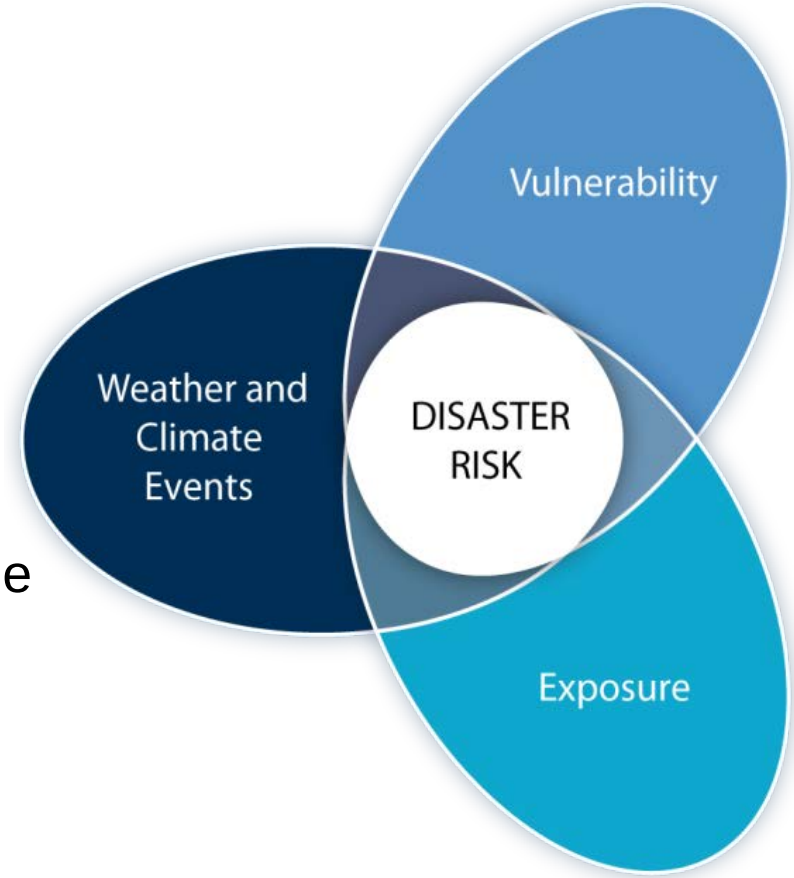
Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk



Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk

Disaster Risk:

the likelihood of severe alterations in the normal functioning of a community or society due to weather or climate events interacting with vulnerable social conditions



Vulnerability:

the predisposition of a person or group to be adversely affected

Exposure: The presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected.

Contents

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3. Changes in vulnerability and exposure
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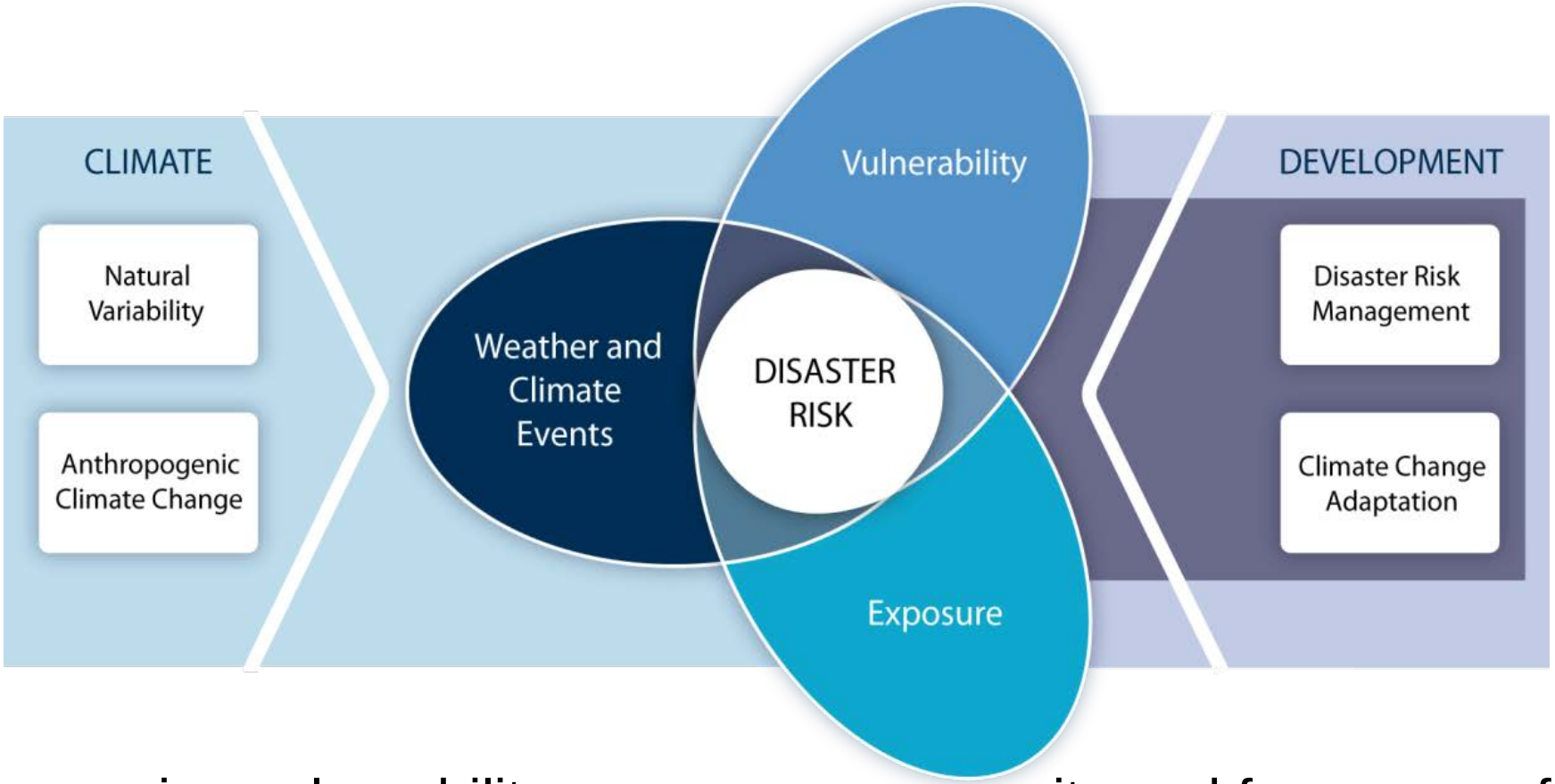
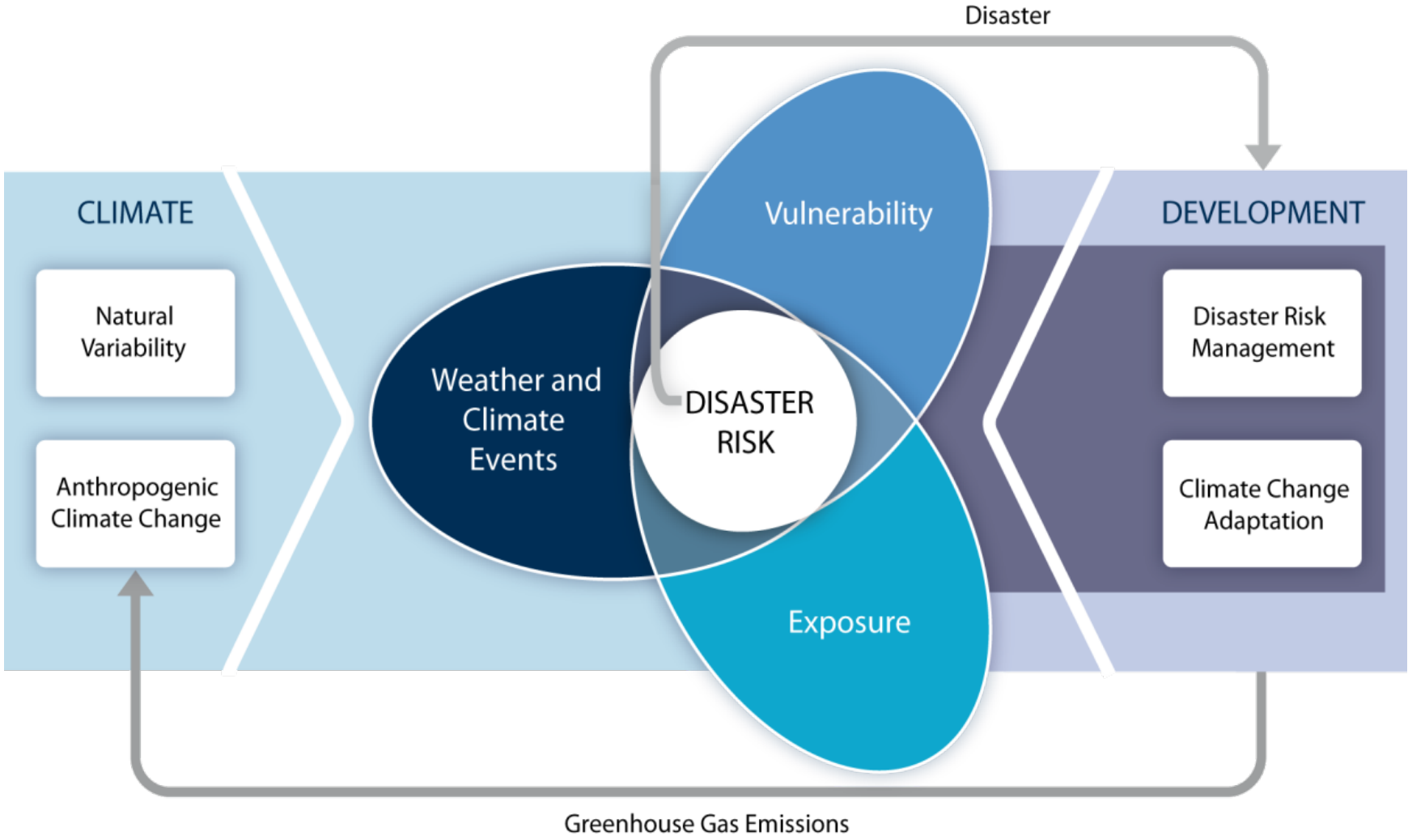
The inter-linkages between the core concepts of the SREX



Increasing vulnerability, exposure, or severity and frequency of climate events increases disaster risk

The inter-linkages between the core concepts of the SREX



Disaster risk management and climate change adaptation can influence the degree to which ***extreme events translate into impacts*** *and* ***disasters***

The inter-linkages between the core concepts of the SREX

- Both changes in vulnerability and exposure and changes in weather and extreme climate events contribute and combine to create disaster risk. Thus, there is a need to address both disaster risk management (DRM) and climate change adaptation (CCA) in development processes.

Contents

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Changes in vulnerability and exposure (1)

- Vulnerability and exposure are dynamic and depend on economic, social, demographic, cultural, institutional, environmental factors and governance.
- Individuals and communities are also differentially exposed based on factors such as wealth, education, gender, age, class/ caste, and health.
- Lack of resilience and capacity to anticipate, cope with and adapt to extremes are important factors of vulnerability.

Changes in vulnerability and exposure (2)

- Extreme impacts on human, ecological, or physical systems can therefore result from individual extreme weather or climate events, from non- extreme events where exposure and vulnerability are high, or from a compounding of events or their impacts.
- High vulnerability and exposure are generally the outcome of skewed development processes.
- Changing patterns of vulnerability and exposure are a key driver of risk and disaster losses.

Changes in vulnerability and exposure (3)

THEREFORE,

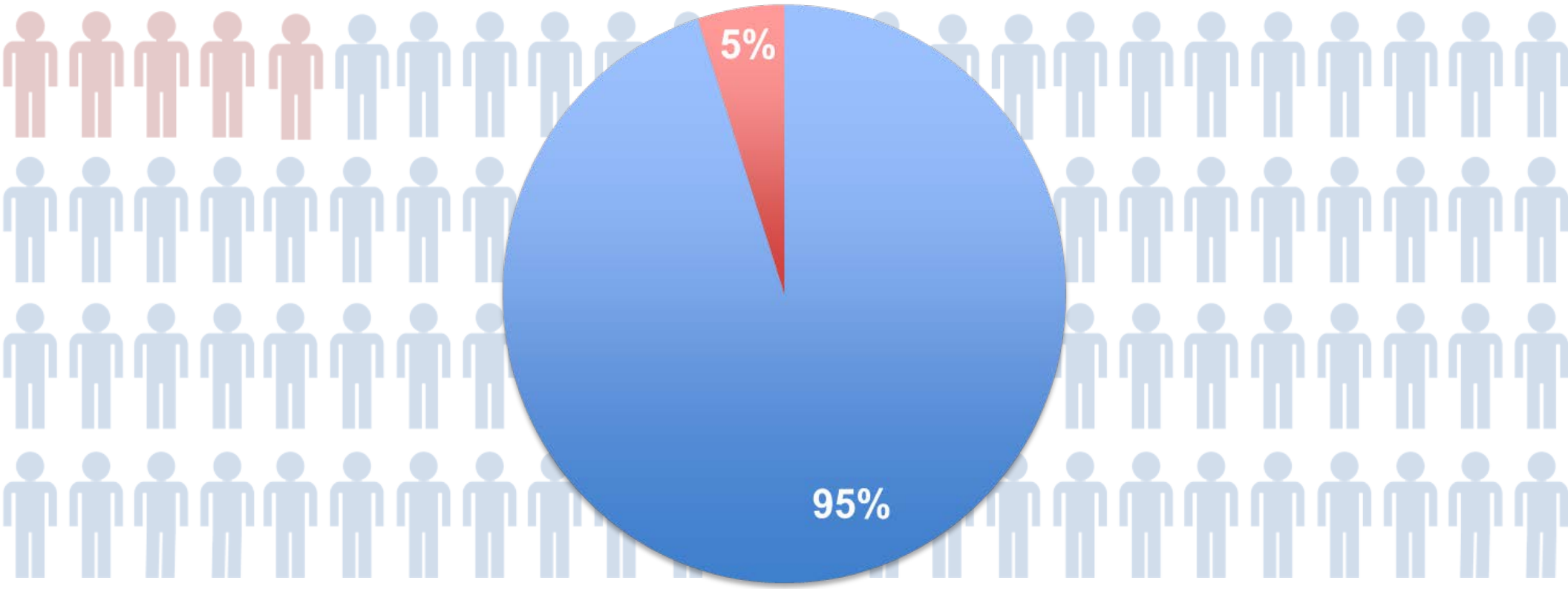
- Understanding the multi- faceted nature of both exposure and vulnerability is a prerequisite for determining how weather and climate events contribute to the occurrence of disasters, and for designing and implementing effective adaptation and disaster risk management strategies.
- Decision and policy making therefore needs to be based on the nature of vulnerability and exposure and not only on the hazard itself.

Increasing exposure of people and assets has been the major cause of changes in disaster losses

Pakistan floods, 2010
6 million left homeless

Economic disaster losses are higher in developed countries

Fatalities are higher in developing countries



From 1970-2008, over **95%** of natural-disaster-related deaths occurred in developing countries

Since 1950, extreme hot days and heavy precipitation have become more common

There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

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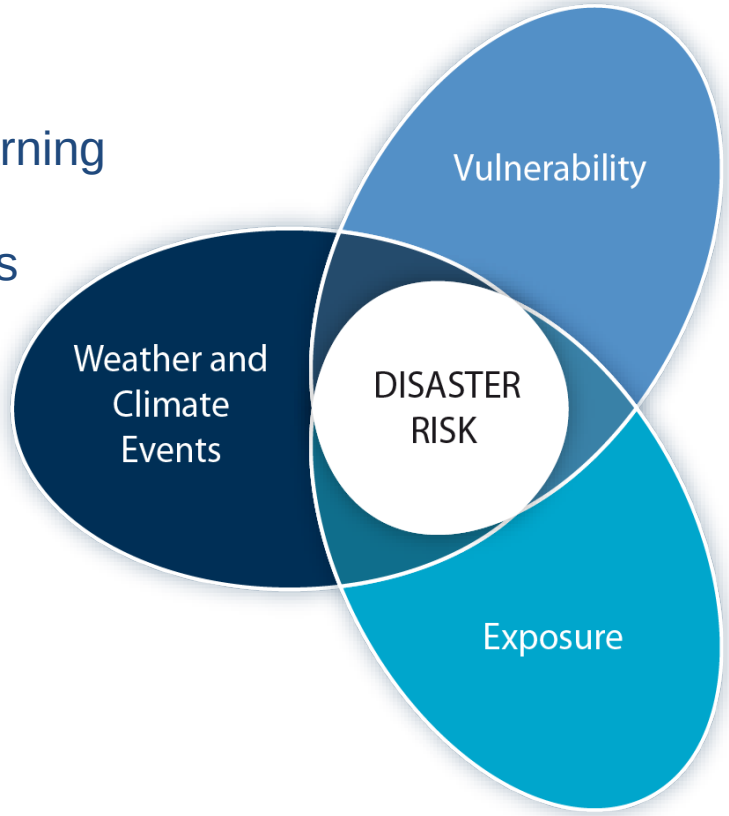
Information on vulnerability, exposure, and changing climate extremes can together inform adaptation and disaster risk management

- poverty reduction
- better education and awareness
- sustainable development

- improved forecasting for warning systems
- reduction of greenhouse gas emissions



- asset relocation
- weather-proofing assets
- early warning systems

Effective risk management and adaptation are tailored to local and regional needs and circumstances

- changes in climate extremes vary across regions
- each region has unique vulnerabilities and exposure to hazards
- effective risk management and adaptation address the factors contributing to exposure and vulnerability

Managing the risks: heat waves in Europe

Risk Factors

- lack of access to cooling
- age
- pre-existing health problems
- poverty and isolation
- infrastructure

France, August 2003 (over 14,000 dead)

Risk Management/ Adaptation

- cooling in public facilities
- warning systems
- social care networks
- urban green space
- changes in urban infrastructure

Projected: *likely* increase in heat wave frequency and *very likely* increase in warm days and nights across Europe

Managing the risks: hurricanes in the USA and Caribbean

Risk Factors

- population growth
- increasing property value
- higher storm surge with sea level rise


Hurricane Katrina, 2005

Risk Management/ Adaptation

- better forecasting
- warning systems
- stricter building codes
- regional risk pooling

Projected globally: *likely* increase in average maximum wind speed and associated heavy rainfall (although not in all regions)

Managing the risks: flash floods in Nairobi, Kenya

Risk Factors

- rapid growth of informal settlements
- weak building construction
- settlements built near rivers and blocked drainage areas


Nairobi, Kenya

Risk Management/ Adaptation

- reduce poverty
- strengthen buildings
- improve drainage and sewage
- early warning systems

Projected: *likely* increase in heavy precipitation in East Africa

Managing the risks: sea level rise in tropical Small Island Developing States

Risk Factors

- shore erosion
- saltwater intrusion
- coastal populations
- tourism economies

Risk Management/ Adaptation

- early warning systems
- maintenance of drainage
- regional risk pooling
- relocation

Projected globally: *very likely* contribution of sea level rise to extreme coastal high water levels (such as storm surges)

Managing the risks: drought in the context of food security in West Africa

Risk Factors

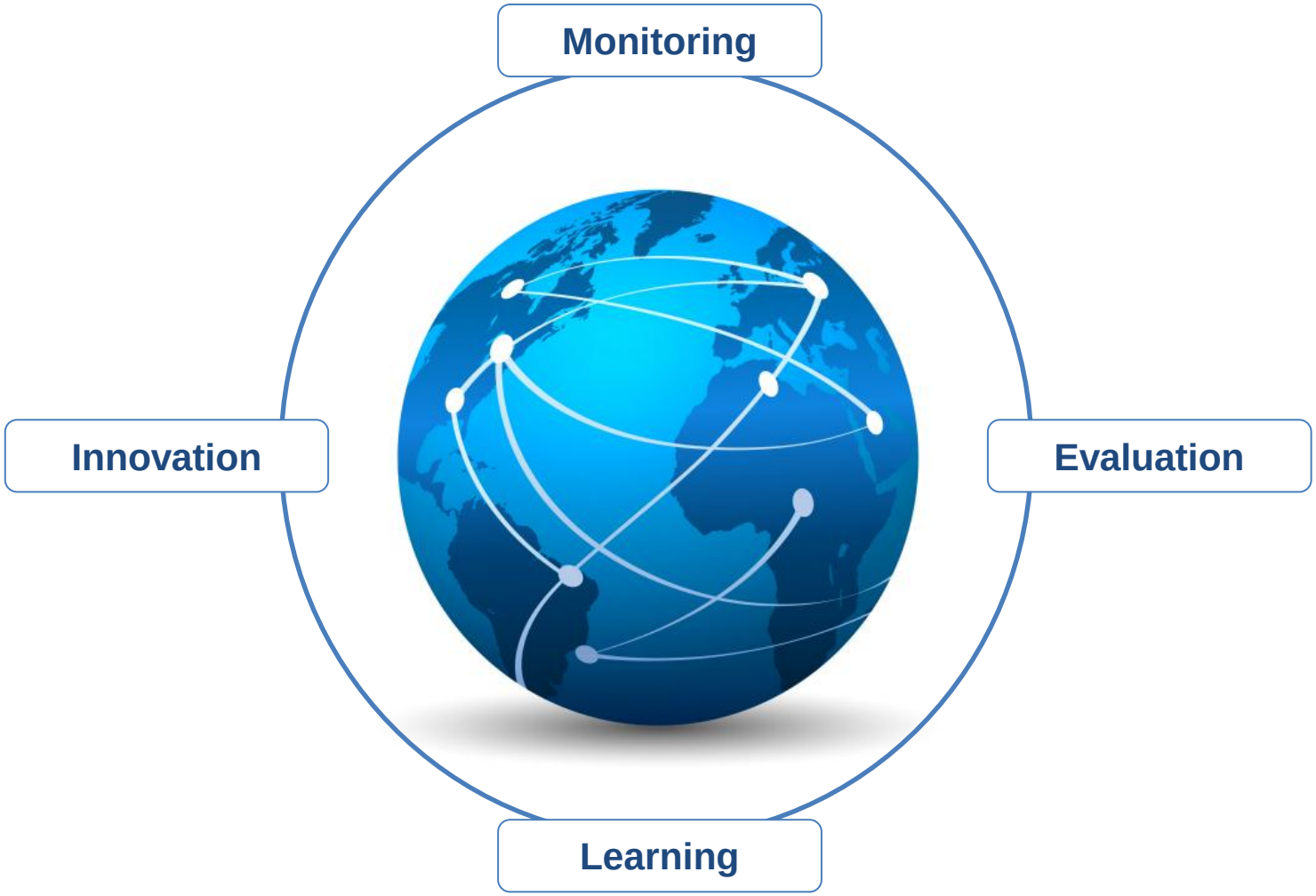
- more variable rain
- population growth
- ecosystem degradation
- poor health and education systems

Risk Management/ Adaptation

- improved water management
- sustainable farming practice
- drought-resistant crops
- drought forecasting

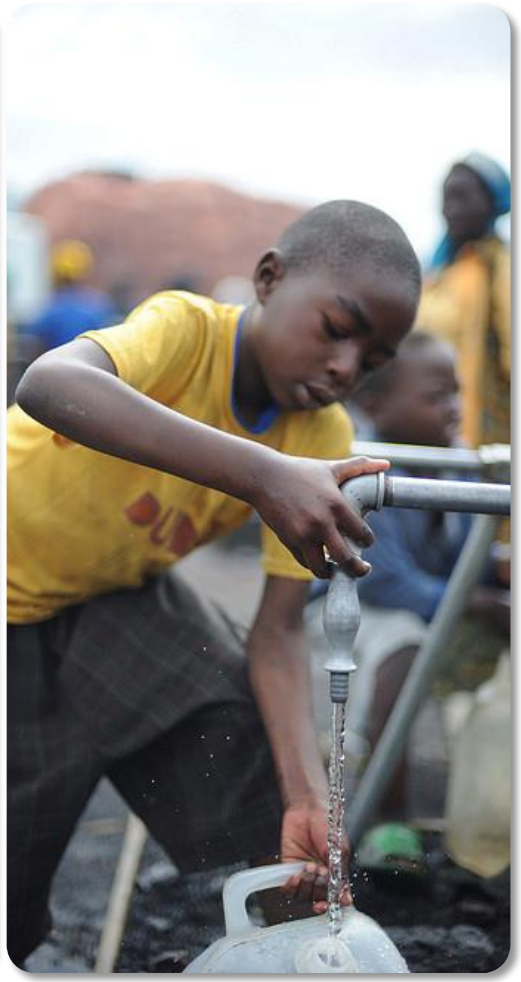
Projected: *low confidence* in drought projections for West Africa

Managing risks of disasters in a changing climate benefits from an iterative process



Learning-by-doing and low-regrets actions can help reduce risks now and also promote future adaptation

There are strategies that can help manage disaster risk now and also help improve people's livelihoods and well-being



The most effective strategies offer development benefits in the relatively near term and reduce vulnerability over the longer term

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Thank you for your attention