

**Global Supply Chain Forum
(Bridgetown, Barbados, 21–24 May 2024)**

Parallel Session 9

**Climate change adaptation, resilience-
building and disaster risk reduction for
ports**

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Global Supply Chain Forum

Parallel Session A7: Climate Change Adaptation, Resilience- Building and DRR for Ports

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SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030

Climate related impacts on supply chains and ports in the last century

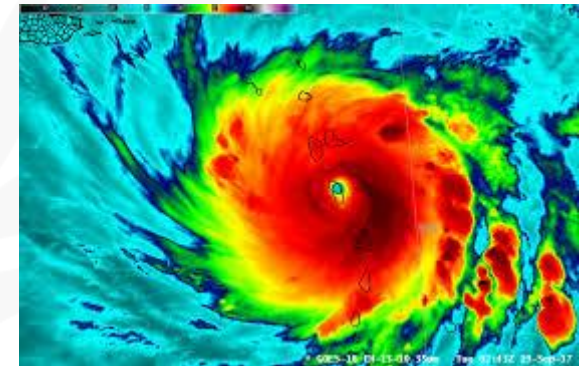


Hurricane Katrina (2005)

- The **economic losses** from the hurricane were estimated to be over **\$125 billion**.
- The closure of the Port of New Orleans and other key ports in the region led to **delays in shipping, affecting industries such as oil and gas, agriculture, and manufacturing**.

Hurricane Maria (2017)

- Hurricane Maria devastated Puerto Rico and other parts of the Caribbean, including key ports like the Port of San Juan. The storm caused widespread damage to infrastructure, leading to **disruptions in shipping and supply chains**. The economic losses in Puerto Rico alone were estimated to be around **\$90 billion**.
- The closure of the Port of San Juan affected the flow of goods and humanitarian aid to the island, leading to **shortages of essential supplies such as food, water, and medical supplies**.



...but, not only climate related hazards impact supply chains!



The Great East Japan Earthquake and Tsunami (2011)

- Devastated Japan's northeastern coast, including ports and manufacturing hubs. The disaster disrupted global supply chains and resulted in economic losses exceeding **\$200 billion**.
- The closure of ports like Sendai and Tokyo disrupted the **production and distribution of automobiles, electronics, and other goods, impacting industries worldwide**.

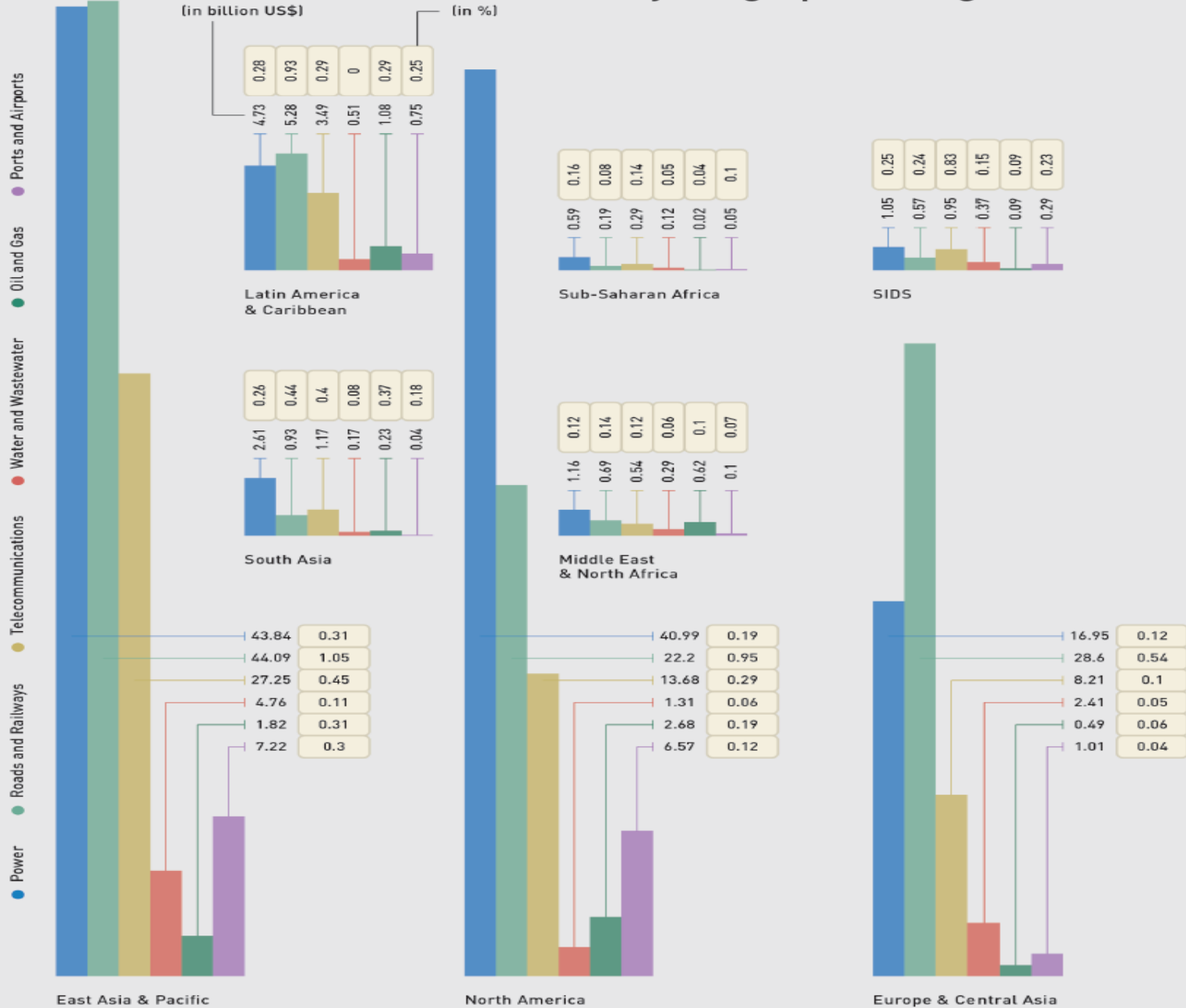
Covid-19

- Widespread disruptions to supply chains and ports globally due to **lockdowns, travel restrictions, and changes in consumer demand**. The economic losses have been staggering, with **estimates surpassing trillions of dollars**.
- Port volumes and shipping activity saw significant declines during the pandemic, affecting industries such as **retail, manufacturing, and logistics**. Delays in shipping and production led to shortages of goods and raw materials worldwide.



Multi-Hazard Absolute and Relative Expected Average Annual Losses by Region and Sector

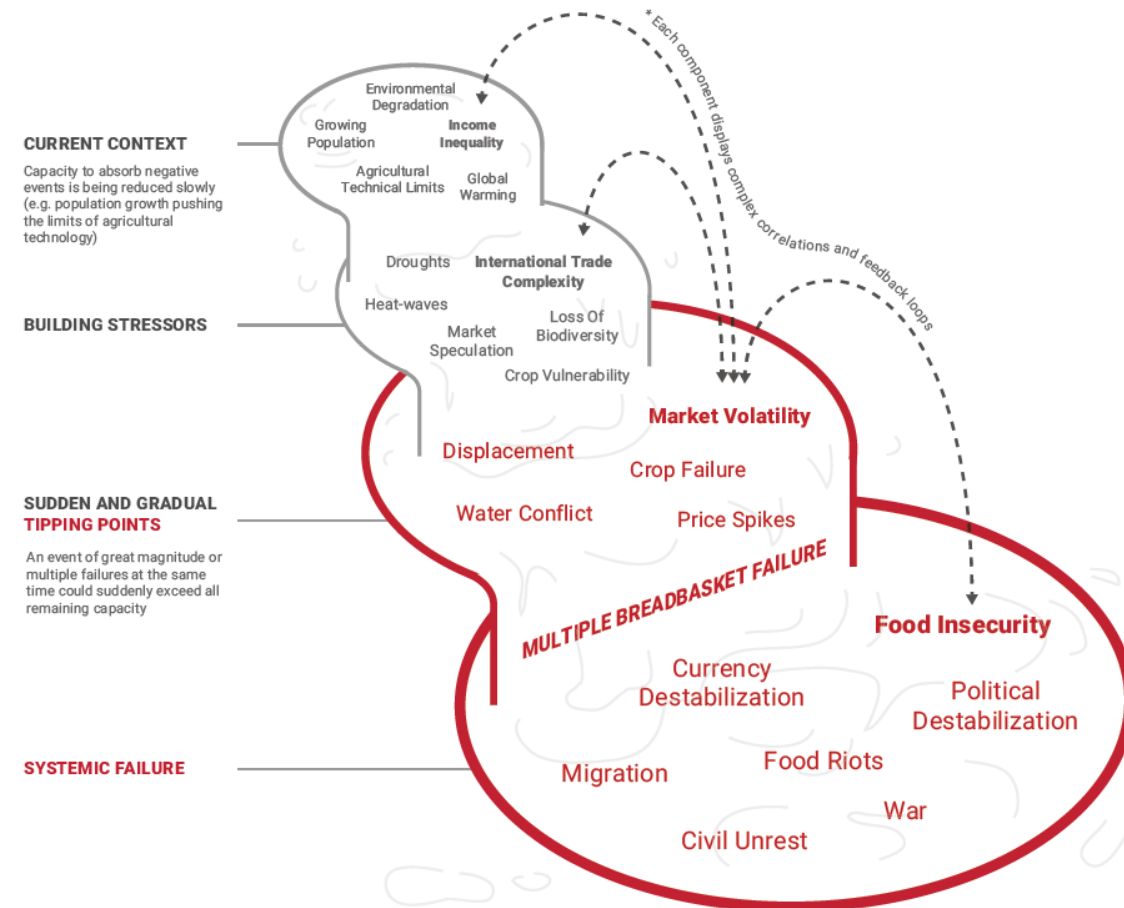
Absolute and Relative AAL by Geographical Regions



Cascading impacts

- **Shortage of Essential Workers**
(truck drivers, local debris removal contractors, factory workers, logistics personnel, utility workers, contracts personnel,
- **Disrupted Medical Supply Chain**
- **A Lack of Food**
 - SIDS heavily dependent on food imports

(Kunkel, 2020)



The Sendai Framework for Disaster Risk Reduction



Chart of the Sendai Framework for Disaster Risk Reduction 2015-2030

Scope and purpose

The present framework will apply to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors.

Expected outcome

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

Goal

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience

Targets

Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015

Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015

Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030

Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030

Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020

Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030

Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030

Priorities for Action

There is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas.

Priority 1
Understanding disaster risk

Priority 2
Strengthening disaster risk governance to manage disaster risk

Priority 3
Investing in disaster risk reduction for resilience

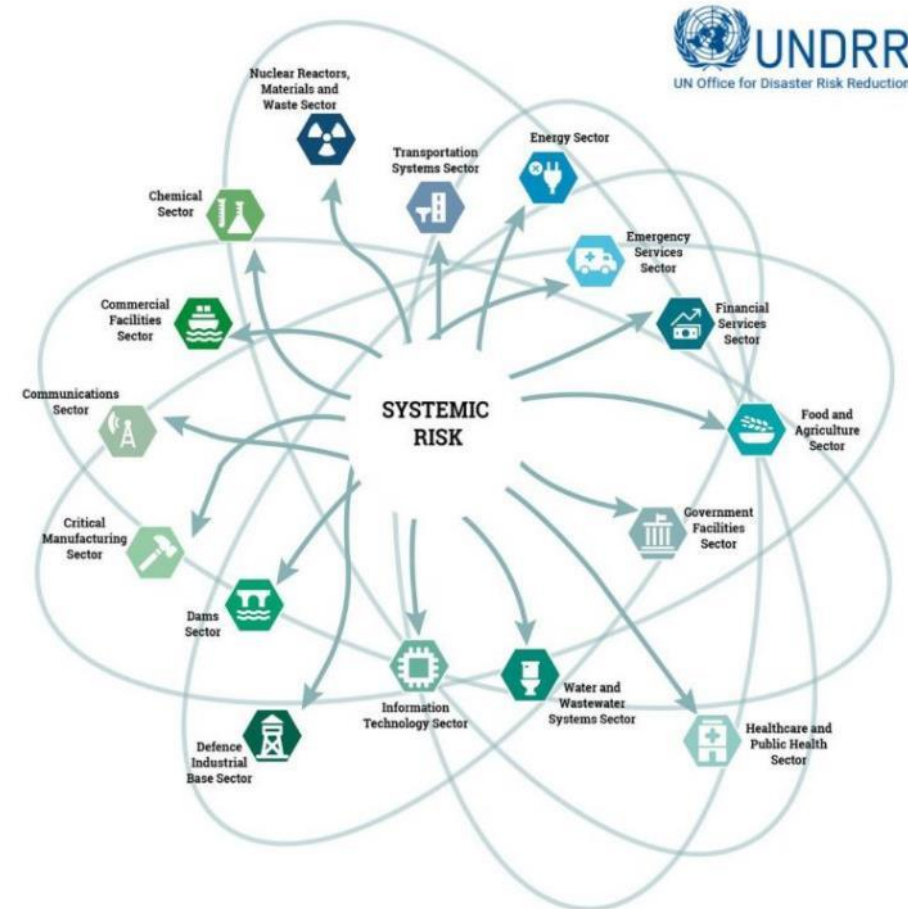
Priority 4
Enhancing disaster preparedness for effective response, and to «Build Back Better» in recovery, rehabilitation and reconstruction

- Risk by definition comprises uncertainties
- There are different attitudes towards risk
- Risk is also always associated to a decision-making process
- **The better our understanding of risk, the more efficient and optimal decisions can be made**
- It is of relevance to understand:
 - what are the possible impacts
 - How often they can occur
 - What actions can be taken for its prospective management/reduction



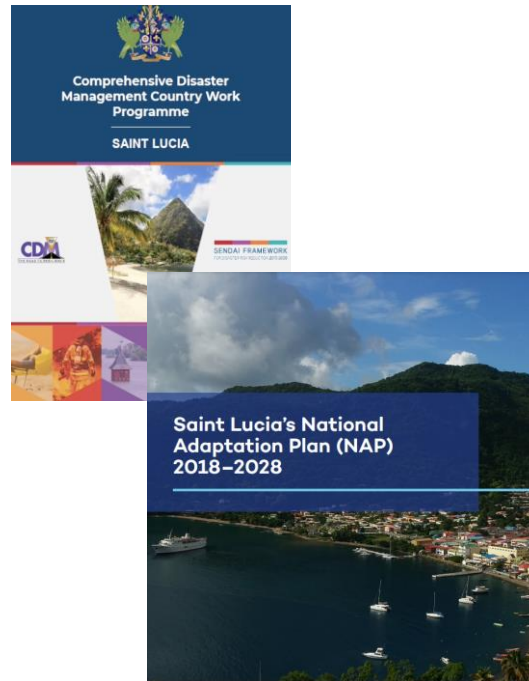
Some remarks about systemic risk

- Global connectivity between sectors, countries and individuals requires a proper understanding and management of systemic risk.
- Systemic risk can be seen as a feature of systems at different scales and is caused by interdependencies in complex systems.
- Systemic risk is based on the idea that risk depends on how the elements of the different affected systems interact.
- Conventional approaches dealt with individual elements of a system. Although useful in some cases, results do not provide a full picture of risk in today's World.



Systemic risk is associated with **cascading impacts** that spread within and across **systems and sectors**

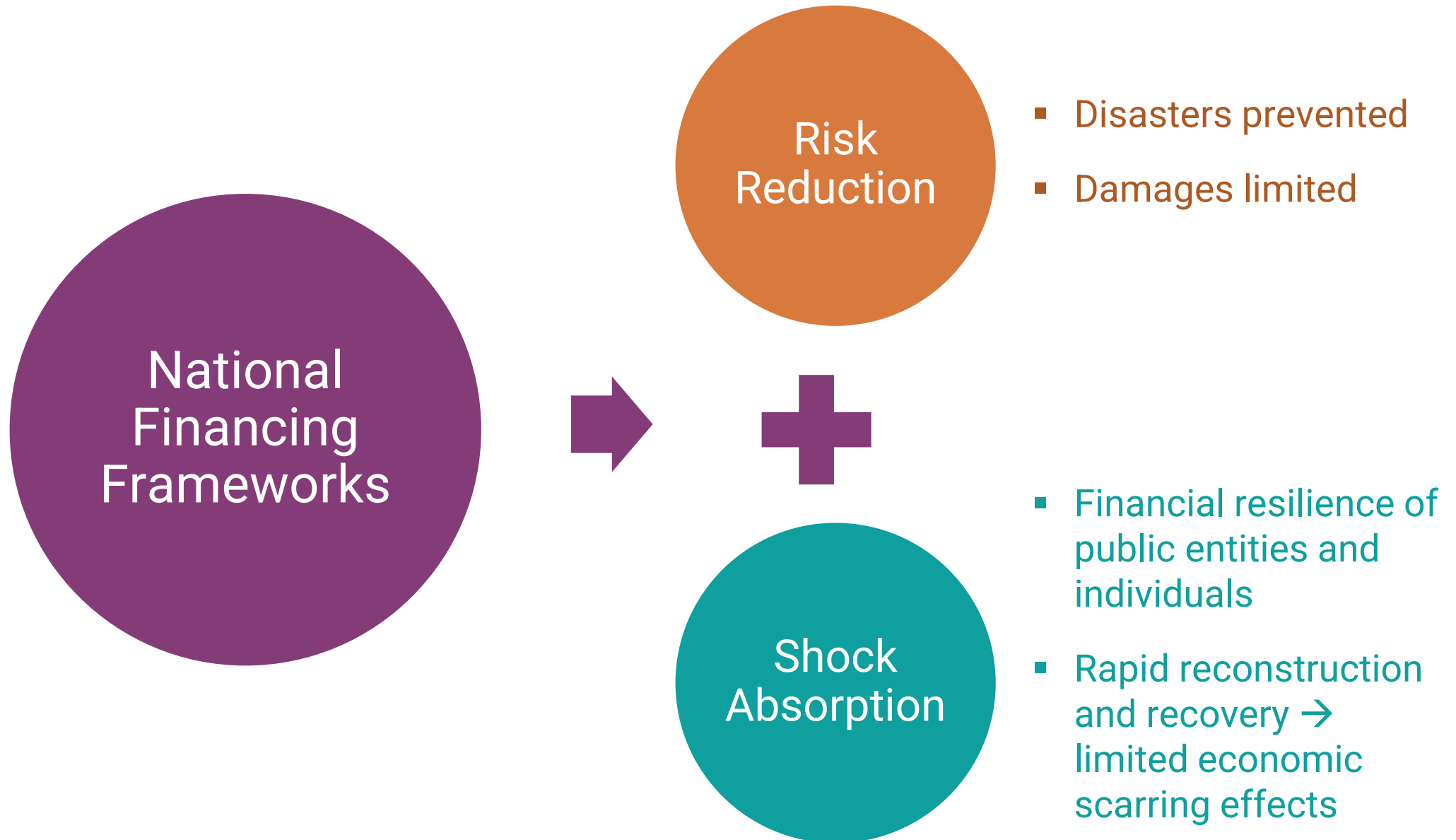
Governance for resilient ports and supply chains



both have developed long-term plans and governance structures to solicit investments to upgrade their transportation networks.

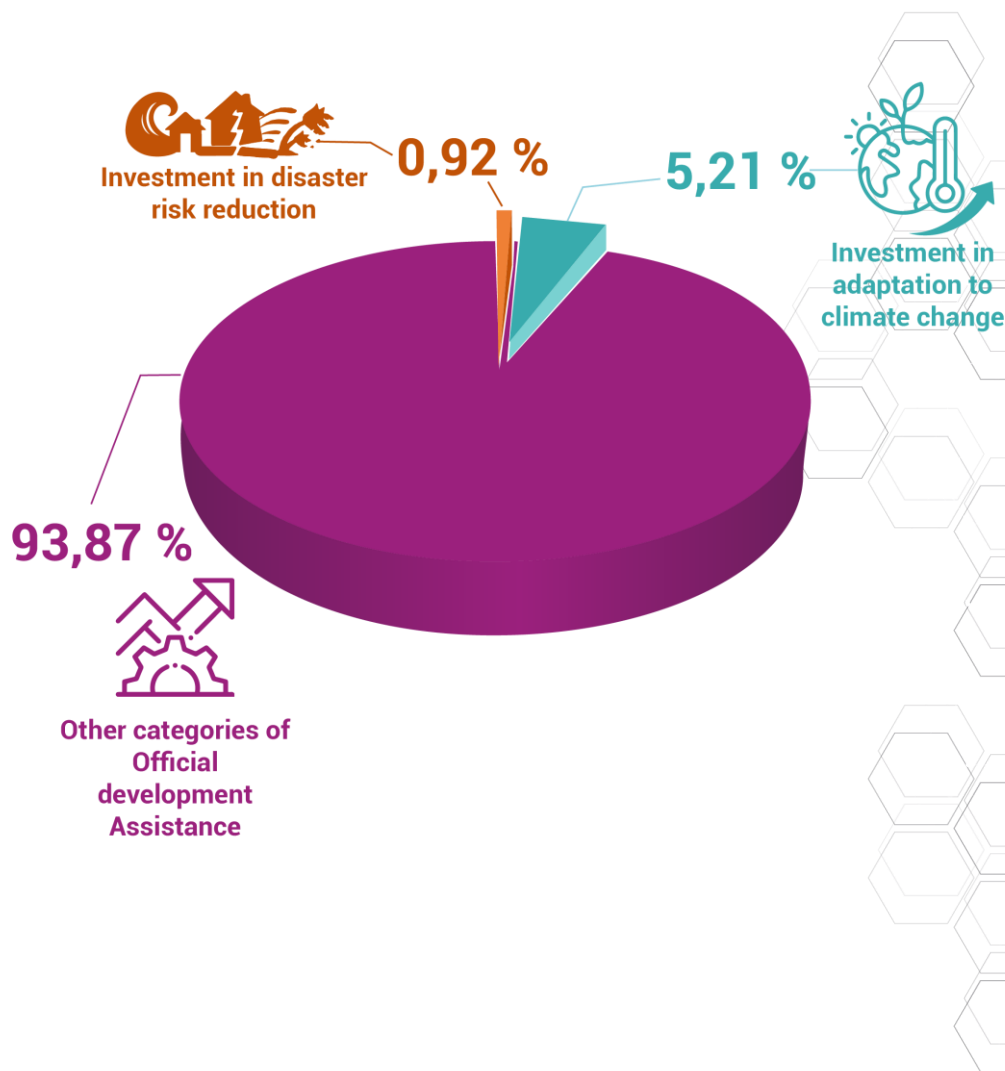
Dual goal for National Financing Frameworks

Priority 3
Investing in disaster risk reduction for resilience



Disaster Risk Reduction Financing

Priority 3
Investing in disaster risk reduction for resilience



Recommendations for scaling up regional investment in DRR and Climate Change Adaptation

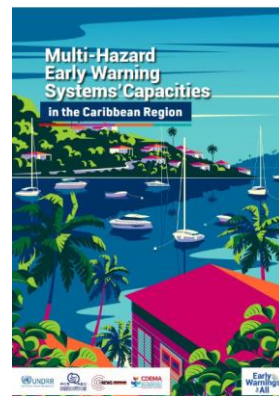
- Investments in DRR and climate change adaptation are complementary and go hand-in-hand to strengthen climate action.
- The region requires significant scaling up in the registry, monitoring and evaluation of DRR financing.
- According to the World Bank, each dollar invested in resilient infrastructure could generate up to USD 4 in returns.
- A mere 6% of official development assistance is allocated to DRR and climate change adaptation. It is important to incorporate these criteria in the remaining 94%.

4+1 Pillars of MHEWS

 <p>Disaster risk knowledge Systematically collect data and undertake risk assessments</p> <ul style="list-style-type: none"> • Are the hazards and the vulnerabilities well known by the communities? • What are the patterns and trends in these factors? • Are risk maps and data widely available? 	 <p>Detection, observations, monitoring, analysis and forecasting of hazards Develop hazard monitoring and early warning services</p> <ul style="list-style-type: none"> • Are the right parameters being monitored? • Is there a sound scientific basis for making forecasts? • Can accurate and timely warnings be generated?
 <p>Preparedness and response capabilities Build national and community response capabilities</p> <ul style="list-style-type: none"> • Are response plans up to date and tested? • Are local capacities and knowledge made use of? • Are people prepared and ready to react to warnings? 	 <p>Warning dissemination and communication Communicate risk information and early warnings</p> <ul style="list-style-type: none"> • Do warnings reach all of those at risk? • Are the risks and warnings understood? • Is the warning information clear and usable?

Priority 4
Enhancing disaster preparedness for effective response, and to «Build Back Better» in recovery, rehabilitation and reconstruction

Inter-Pillar = GOVERNANCE



Applications for Ports and Supply Chains

- Personal Safety
moving to safe zone
- Situation awareness
initiating response before impact
launching contingency planning
- Automated control
slowing/stopping/isolating

Thank you

For more information, please contact

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