

# Literature review



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**Overview of a range of approaches to address loss and damage currently in practice in the region:**

*Key findings from the background paper,*

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## Overview & context

- **Loss and damage continuum:** A continuum of climatic events intensified or caused by climate change that ranges from extreme weather events to slow onset climatic processes.
- **Addressing loss & damage** requires understanding the events and processes associated with the adverse impacts of climate change. Mitigation and adaptation actions matters to reduce loss and damage. Loss and damage and its defining variables of hazard (emissions), vulnerability and exposures changes over time and regions.
- **Four groups of approaches fit along the loss & damage continuum.** Risk reduction, risk retention, risk transfer and approaches to address slow onset impact. Combinations of the four groups of approaches are needed throughout the continuum
- **Choosing the right mix of approaches** for a country or region depends on the sectors exposed to loss and damage, & social and economic characteristics of a country.



# Overview & context

## ■ Gaps in knowledge and practice

- Most knowledge and practice today is about responding to extreme weather events. Substantial awareness about the need for effective prevention and risk reduction.
- There are relevant experiences in adaptation actions that increase resilience to address the negative impacts of some of the slow onset events influenced by climate change. However, major gaps exist about approaches to address loss and damage resulting from slow onset climatic processes, both today and in the future



# Literature review method

- Take into account of recent meta-analyses: Global Assessment Report of UNISDR/ SREX Report of the IPCC
- Key word search in 1) scientific literature, 2) relevant practitioner and policy literature, 3) NWP contributions
- Organization of literature according to 4 expert meetings. Analysis of references in the context of questions from Annex of 7/CP.17
- Inclusive process of collecting additional references based on delegate suggestions
- Peer review process
- Limitations: approaches listed in this literature review are not exhaustive and other approaches and varieties may exist, including at the local level.



# Approaches: Risk Reduction

- Risk reduction measures are undertaken before an actual extreme event occurs.
- Risk reduction is often used effectively for those kinds of climate-related stressors which occur often and whose impacts are relatively low.
- Examples
  - Non-structural: Indigenous knowledge systems, early warning, adjustments in livelihood practices like agriculture, education, building codes
  - Structural: building protection structures like water retention dams, flood protection walls / sea walls, building retrofitting
  - Combinations of technology, education, engineering, early warning, etc. have all been used to help societies anticipate and reduce potential loss and damage from weather extremes (usually those which are frequently observed and for which relatively more information is available).
- Risk reduction is appropriate across all sectors of an economy and in all ecosystem types, although the design specifications differ.



# Examples from SIDS: Risk Reduction



## Early warning systems

- The Pacific: A water monitoring system was established in the Pacific called the Hydrological Cycle Observation System's (HYCOS).
- The Caribbean: SERVIR, provides regional visualization and monitoring system, earth observations (e.g. satellite imagery) and forecast models together with on-the-ground data; CCRIF develops EW system to inform policy holders via SMS



# Examples from SIDS: Risk Reduction



Improvements in roofing, Jamaica



Coastal protection measures, Jamaica

## Structural measures

- Antigua and Barbuda took on a reconstruction project to reduce the level of impact on the poor and vulnerable. In particular, low income and low cost buildings were re-designed to withstand future climate extremes
- In the case of SIDS threatened by sea level rise such as Samoa, relatively low-cost measures such as using mobile flood barriers and planting mangroves have been employed





# Risk Retention Approaches

- Group of approaches which allows a country to “self-insure” itself against climatic stressors
- Examples
  - Building social, physical, and economic resilient: Social funds, social safety nets
  - Financial risk retention: “passive” reallocation of budgets in the case of an emergency, “proactive” financial planning and use of tools like reserve funds for offsetting unexpected financial burdens associated with climatic stressors.
- Risk retention is used in every public sector, as well as in the private sector.
- The purposeful and planned use of risk retention can be part of a balanced set of complimentary approaches to manage loss and damage;
- However, **unplanned and unforeseen expenses can place significant burden on the public sector**, one of the greatest disadvantages of (financial) risk retention.





# Examples from SIDS: Risk Retention



- Some SIDS have adopted social protection mechanisms before, during and after disasters. Solomon Island, after a tsunami in 2007, intra and inter-community initiatives, mainly in the form of social events were used by communities to cope
- The IDB grants Contingent Loans for Natural Disaster Emergencies to support countries in their efforts to improve their DRM efficiency.
- Several Pacific islands have set up sovereign wealth funds (SWF), as financial instruments that can help assist citizens after natural disasters.



# Risk Transfer Approaches

- Risk transfer approaches help shift the – mostly financial – risks of loss and damage from one entity to another.
- Risk transfer usually is associated with a fee for the service provided (e.g. of one entity assuming responsibility for the part of the risk that is transferred).
- Risk transfer is undertaken when the country or entity assesses that the potential loss and damage it could experience could be greater than its ability to manage that loss and damage.
- Examples:
  - Insurance (micro-, meso-, macro), catastrophe bonds, conditional risk transfer, combined insurance-credit programs, etc.
- Risk transfer is used to reduce the uncertainty and volatility associated with potential loss and damage.
- Risk transfer does not directly prevent or reduce the risk of damage or loss; however, the financial liquidity provided by this set of approaches can reduce some of the indirect effects of damage



# Examples from SIDS: Risk Transfer



- Caribbean Catastrophe Risk Insurance Facility (CCRIF), which was established in 2007. This is the first world-wide regional catastrophe pool, which provides government with immediate liquidity in the aftermath of extreme events.
- “Climate Risk Adaptation and Insurance in the Caribbean” programme, which aims to help vulnerable people better cope with extreme weather events by implementing products that combine risk reduction and insurance for low income groups
- Central America and the Dominican Republic have created the Central America Natural Disaster Insurance Facility which provides governments with quick access to insurance proceeds



# Approaches to manage slow onset climate processes

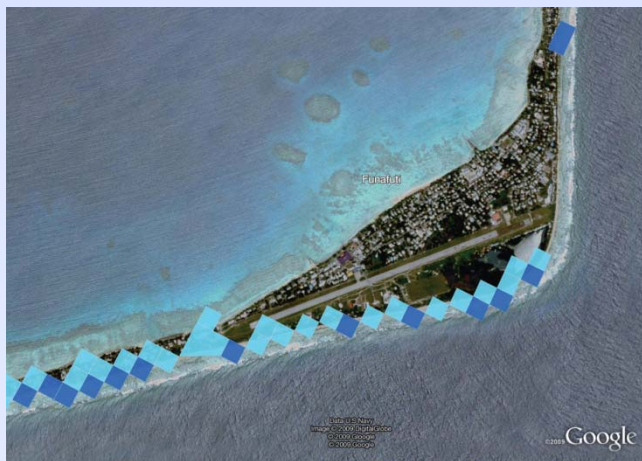
- Slow onset climatic processes influenced by climate change are under way today and will be exacerbated in the future
- There are relevant experiences in adaptation actions that increase resilience to address the negative impacts of some of the slow onset events influenced by climate change. For example, sustainable land management addresses desertification and land degradation while ecosystem based adaptation and sustainable forest management address loss of biodiversity. Activities take place to create institutional and governance approaches
- However, this is the area under approaches to address loss and damage where most needs to be learned, new approaches tested and experiences shared



# Examples from SIDS: Approaches to address incremental climate change



Maldives projected SLR 1, 2 m, Source: Warner et al 2009



Funafuti, Tuvalu. Projected SLR 1, 2 m, Source: Warner et al 2009

- Solomon Island National Climate Change Policy to take ownership of planning and implementing adaptation, risk reduction and mitigation actions.
- The Pacific Islands Framework for Action on Climate Change was developed to improve and upgrade policies, tools, institutional capacity and governance, to monitoring climate change processes and variability

# Analysis of SIDS experience



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- SIDS are beginning a number of risk management and adaptation strategies, but gaps remain in each category of approaches.
- Identified gaps in the literature include institutional capacity, qualified staff, limited monitoring stations, poor hazard mapping and monitoring abilities, the use of a “wait and see approach”, the poor integration of sovereign funds into budget, and an ad hoc creation of social protection schemes, where they are present. Risk transfer is largely underutilized especially in the Pacific.
- Measures have been taken in developing new policies and improving institutional capacity to deal with both extreme and slow-onset events. SIDS mostly build their adaptation capacity through participation in regional schemes.
- Loss and damage already presents a profound challenge for SIDS communities. Further impacts from a combination of weather extremes and slow onset events will bring about an increasing trend of loss and damage.

# Thank you.



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# Analysis of Risk Reduction Approaches



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<b>Foundational Resource Requirements – Risk Reduction Measures</b>		
	<b>Non-Structural</b>	<b>Structural</b>
<b>Budget</b>	Non-Structural approaches can be relatively inexpensive but must be done on an ongoing basis (e.g. yearly for a decade or two)	Structural measures can be costly (infrastructure) to build and maintain over infrastructure lifespans of 20 – 50 years A country must be in the position to finance a large infrastructure investment
<b>Infrastructure or equipment needed</b>	Early warning systems need effective radio or other location-appropriate communications systems Public outreach / education system Monitoring systems	Sea level walls Flood retention walls Water retention systems (dams) Building retrofitting
<b>Information &amp; data</b>	Hazard information Risk mapping Weather information Forecasting systems and modeling	Hazard information Risk mapping Engineering
<b>Technical capacity (experts, etc.)</b>	Risk communication Planning at different levels	Engineering Planning at different levels

# Analysis of Risk Retention Approaches



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## Foundational Resource Requirements – Risk Retention Measures

	<i>Resilience – building</i>	<i>Financial risk retention (paying for the impacts)</i>
Budget	Resilience building approaches require sustained and targeted financing over a period of years	Self-financing potential loss and damage can be costly and impose itself on public budgets exactly when liquidity is in greatest demand
Infrastructure or equipment needed	Targeting programs to reach the right groups	Sound financial planning and financial forecasting
	Public outreach / education system	Clear legislation to administer funds
	Monitoring systems	
Information and data	Hazard information	Hazard information
	Risk mapping	Risk mapping
	Weather information	Weather information
Technical capacity and planning (experts, etc.)	Forecasting systems and modeling	Forecasting systems and modeling
	Social protection and targeting experts	Financial risk management, esp. in public sector

# Analysis of Risk Transfer Approaches



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## Foundational Resource Requirements – Risk Transfer Measures

*Generalized requirements for risk transfer*

Budget	Cost of risk transfer is an equation of the “pure cost of risk”, plus the cost of administering the risk transfer
Infrastructure or equipment needed	<p>Weather information and monitoring systems</p> <p>Forecasting systems and modeling</p> <p>Insurance regulation frameworks</p> <p>Financial system</p>
Information and data	<p>Hazard information</p> <p>Risk mapping</p> <p>met service and satellite)</p> <p>Risk analysis, risk mapping, hazard-asset- and vulnerability exposures</p>
Technical capacity (experts, etc.)	<p>Risk assessment and modeling experts</p> <p>Financial risk, insurance experts</p>

# Analysis of Approaches to manage slow onset climatic processes

## Foundational Resource Requirements – Measures to address slow onset climatic processes

	<i>Current approaches</i>	<i>Future approaches</i>
<b>Budget</b>	<p>Policy frameworks</p> <p>Political and social dialogue</p> <p>Investments in research and innovation</p>	<p>Future approaches may range from “extreme” physical infrastructure investments, new forms of social organization and population distribution, etc. Such costs will be difficult to finance.</p>
<b>Infrastructure or equipment needed</b>	<p>Communication</p> <p>Community and citizen engagement</p> <p>National dialogue and policy making</p> <p>Regional dialogue</p>	<p>All of the dialogue and planning currently used, plus more intensive regional and national monitoring and coordination approaches</p> <p>Infrastructural measures at new scales</p> <p>Relocation of at-risk populations</p> <p>Transboundary livelihood arrangements in some areas</p> <p>Provisions for fresh water at large scale</p> <p>Large-scale livelihood programs</p>

# Analysis of Approaches to manage slow onset climatic processes

(continued)



**Information and data**

Hazard information

Hazard information

Risk mapping

Risk mapping

Weather information

Weather information

Forecasting systems and modeling

Forecasting systems and modeling

Social and physical thresholds

Social and physical thresholds

**Technical capacity (experts, etc.)**

Policy and planning

Policy and planning

Infrastructure

Weather and climate modeling

Thresholds monitoring

Economic and financial tools

Economic / livelihood alternatives

Regional diplomatic relations