



Defining the risk and policy space for Loss and Damage: A broadening role for climate risk analysis

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*Session C1: Costs of CC and the Loss &
Damage Mechanism*

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Policy response to the climate challenge

Paris COP 21



But: Responsibility and justice?



But: dangerous climate change-related risks already affecting vulnerable populations and systems



Policy responses for risks beyond adaptation

The Loss & Damage Mechanism

- **AOSIS** in **1991** proposed establishment of a compensation scheme for the most vulnerable small island and low-lying coastal states
- **Warsaw Loss and Damage mechanism institutionalised in 2013**
- L&D with **stand-alone article 8 in Paris agreement 2015**
- **3rd pillar of deliberations** under the UNFCCC in addition to mitigation and adaptation
- **Contested terrain**
 - ‘Southern countries’ at risk (such as AOSIS) demand **compensation for past impacts**, reject risk management as involves national responsibility
 - OECD negotiators willing to support **risk management for future risks**, part. **insurance**, but liability and compensation considered red lines



2. The scale of L&D finance needs

L&D needs may reach the order of one trillion US dollars per year - the same order of magnitude or more than adaptation needs – further studies on L&D finance needs are required.

- Available studies on the global scale of L&D indicate that this figure rises to around \$1 trillion per year: ActionAid (2010) cite Hope's 2009 study estimating a range of \$0.3-2.8 trillion in 2060 after mitigation and adaptation, with an average of \$1.2 trillion. Annual damage would continue to rise after this year, with a total damage of \$275 trillion from 2000 to 2200 with likely adaptation and with stabilising emissions at 450ppm – this figure increases to \$890 trillion with a business-as-usual emissions trajectory. More recently, Baarsch et al. (2015) suggest L&D costs (not needs) for developing countries of around \$400bn in 2030, rising to \$1-2 trillion by 2050. DARA (2012) estimate global climate change-induced L&D in 2010 at almost \$700bn (with over 80% of net losses falling on developing countries), rising to \$4 trillion by 2030 (with developing countries bearing over 90% of net losses). UNEP's *Africa's Adaptation Gap 2* report (2015) estimates L&D costs for Africa, assuming cost-optimised adaptation effort, at just over \$100bn per year by 2050 (on top of adaptation costs of \$50bn) if warming is kept below 2°C, and around \$160bn per year (on top of adaptation costs of \$95bn) if warming goes above 4°C.
- Further work is required on the methodologies and processes for estimating L&D and associated finance needs, as well as non-economic losses.

Definitions and questions



Avoided	Unavoided	Unavoidable
Avoidable damage avoided	Avoidable damage and loss not avoided	Unavoidable damage and loss
→ Damage prevented through mitigation and/or adaptation measures.	→ Where the avoidance of further damage was possible through adequate mitigation and/or adaptation, but where adaptation measures were not implemented due to financial or technical constraints.	→ Damage that could not be avoided through mitigation and/or adaptation measures; e.g., coral bleaching, sea level rise, damage due to extreme events where no adaptation efforts would have helped prevent the physical damage.

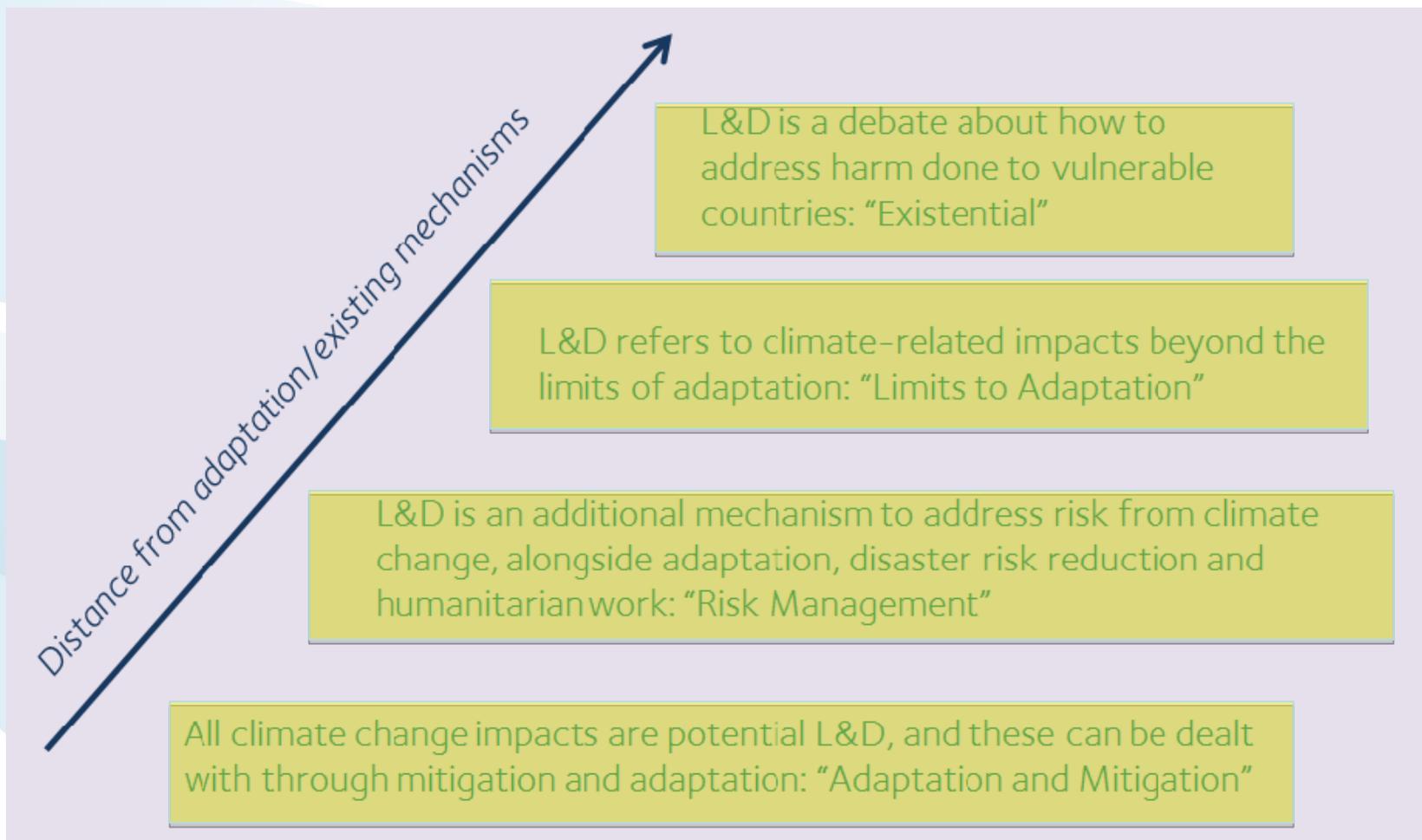
Source: Verheyen, 2008

Dealing with unavoided risks today AND avoiding future risks and preventing unavoidable risks?

How different –or the same- as adaptation and disaster risk management?

What is the risk and options space?

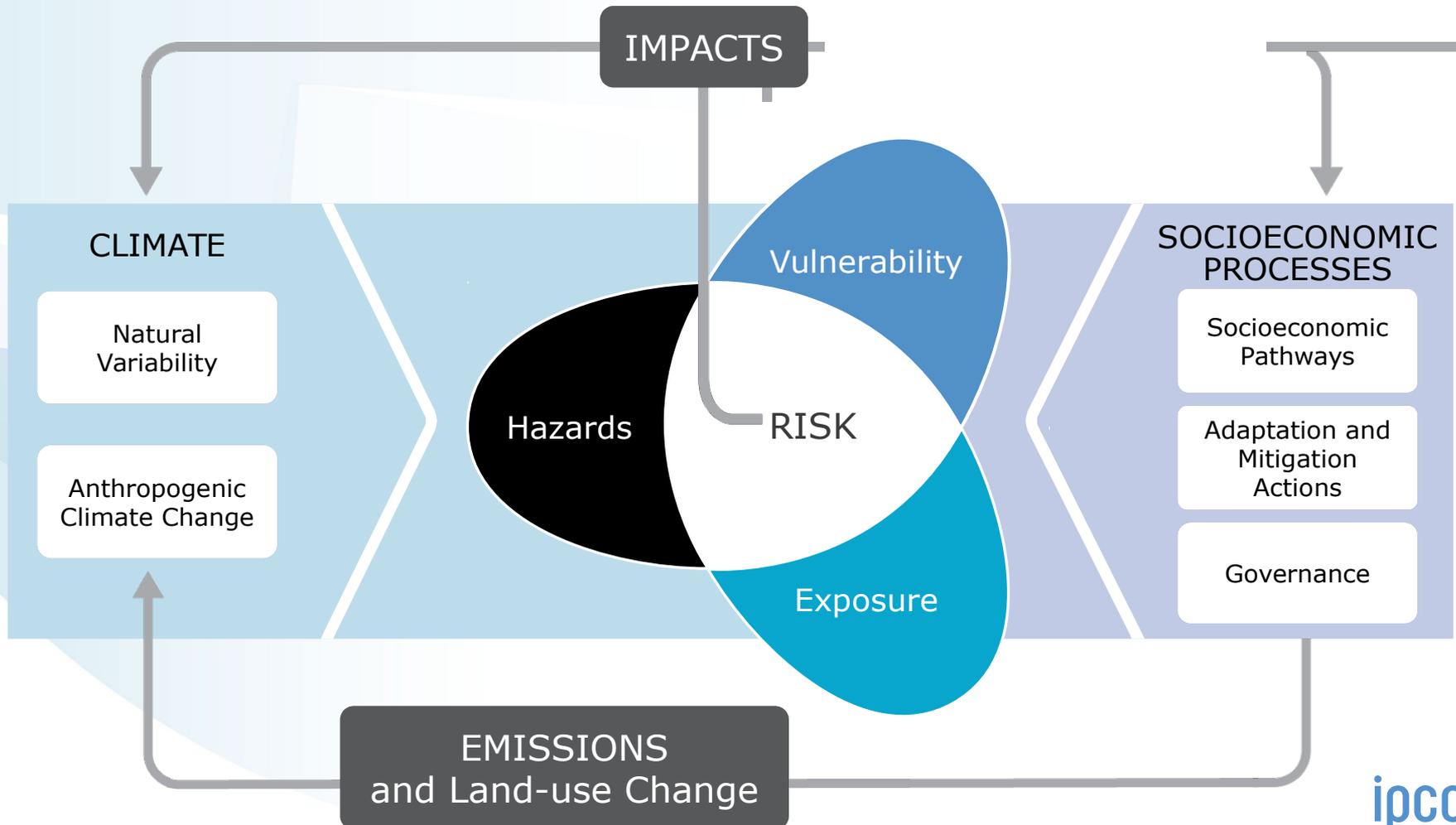
Perspectives on Loss and Damage



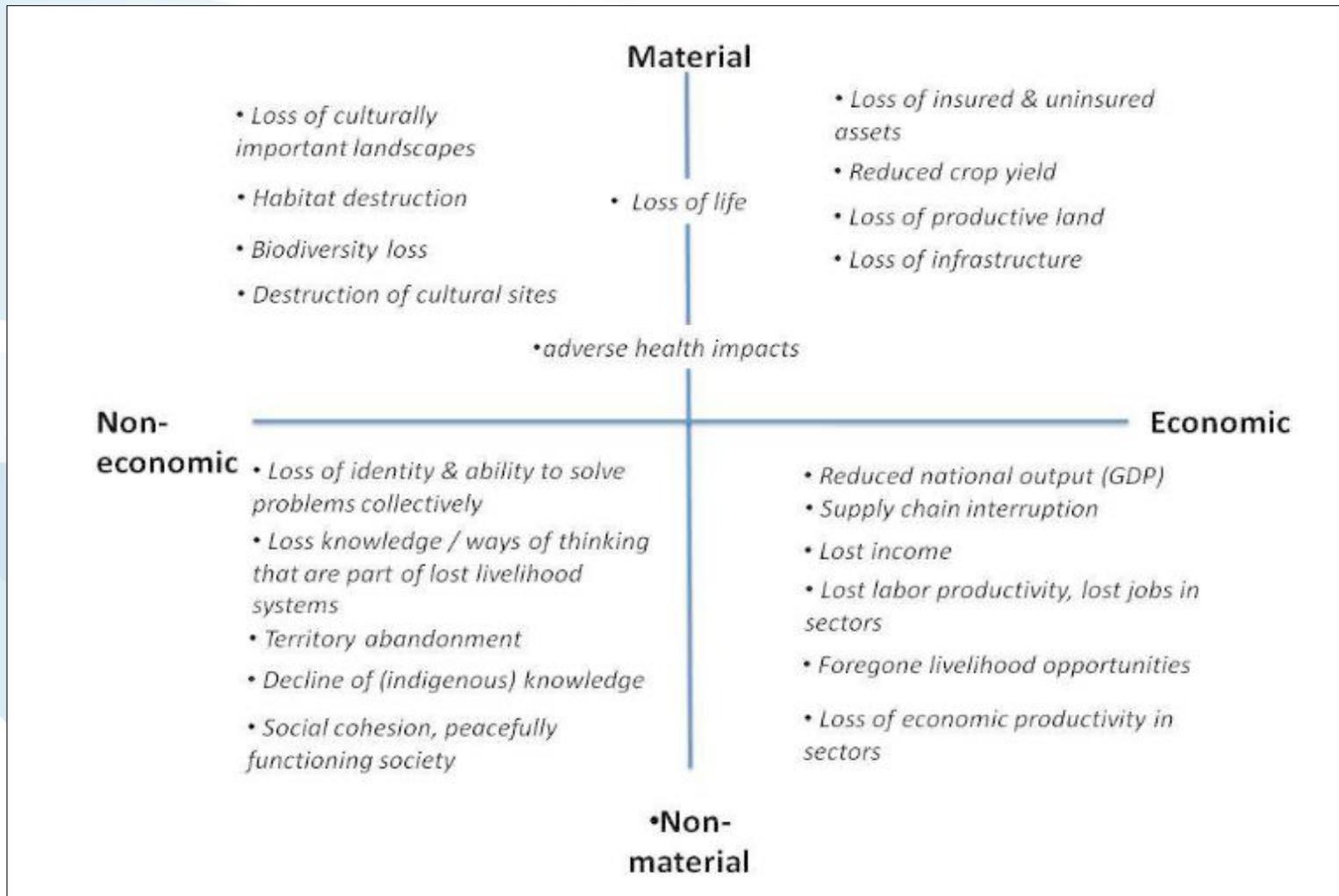
Methodological approach for identifying the Loss and Damage space

- Principled approach to the L&D debate
 - Integrate evidence from attribution studies and work towards **compensatory justice** ☾ curative options
 - Supporting climate risk management via **distributional justice** ☾ transformational options
 - Signaling urgency of 1.5°/2° C ambition
- Building blocks for policy proposal on Loss&Damage
 1. Comprehensive risk analytics (IPCC, 2014)
 2. Risk evaluation: risk preference and tolerance (Klinke and Renn, 2002)
 3. Justice principles (Wallimann-Helmer et al., 2015; 2017)

1. Comprehensive risk analytics



Impacts to consider



Climate-related risk



Hazard

***Intensities, duration and frequencies of some hazards changing (IPCC 2012&14)
Extreme event attribution in early stages (James et al., 2014; Trenberth et al., 2015)***



Exposure

Dominating factor - currently (IPCC, 2012&14)



Vulnerability

Key driver, knowledge gaps, significant adaptation deficit (IPCC, 2012)



Risk

Climate attribution very complex (Schaller et al., 2016)

Images:
IPCC, 2014

IPCC Risk language

Level of risk & potential for adaptation

Potential for additional adaptation to reduce risk

←

Risk level with **high** adaptation

Risk level with **current** adaptation

Climate-related drivers of impacts



Warming trend



Extreme temperature



Drying trend



Extreme precipitation



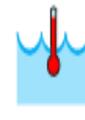
Damaging cyclone



Sea level

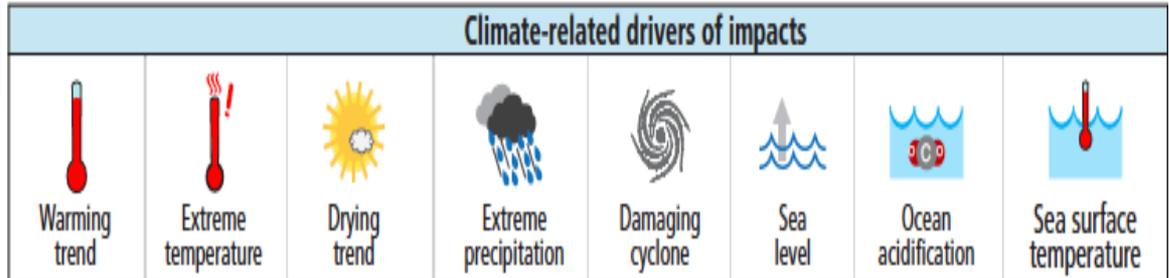
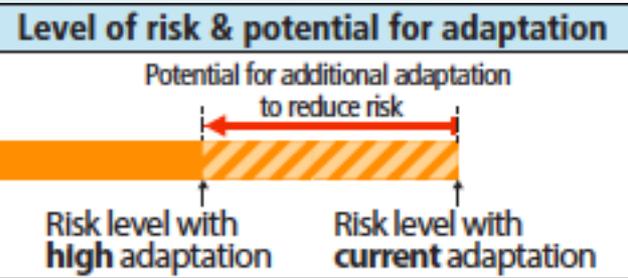


Ocean acidification

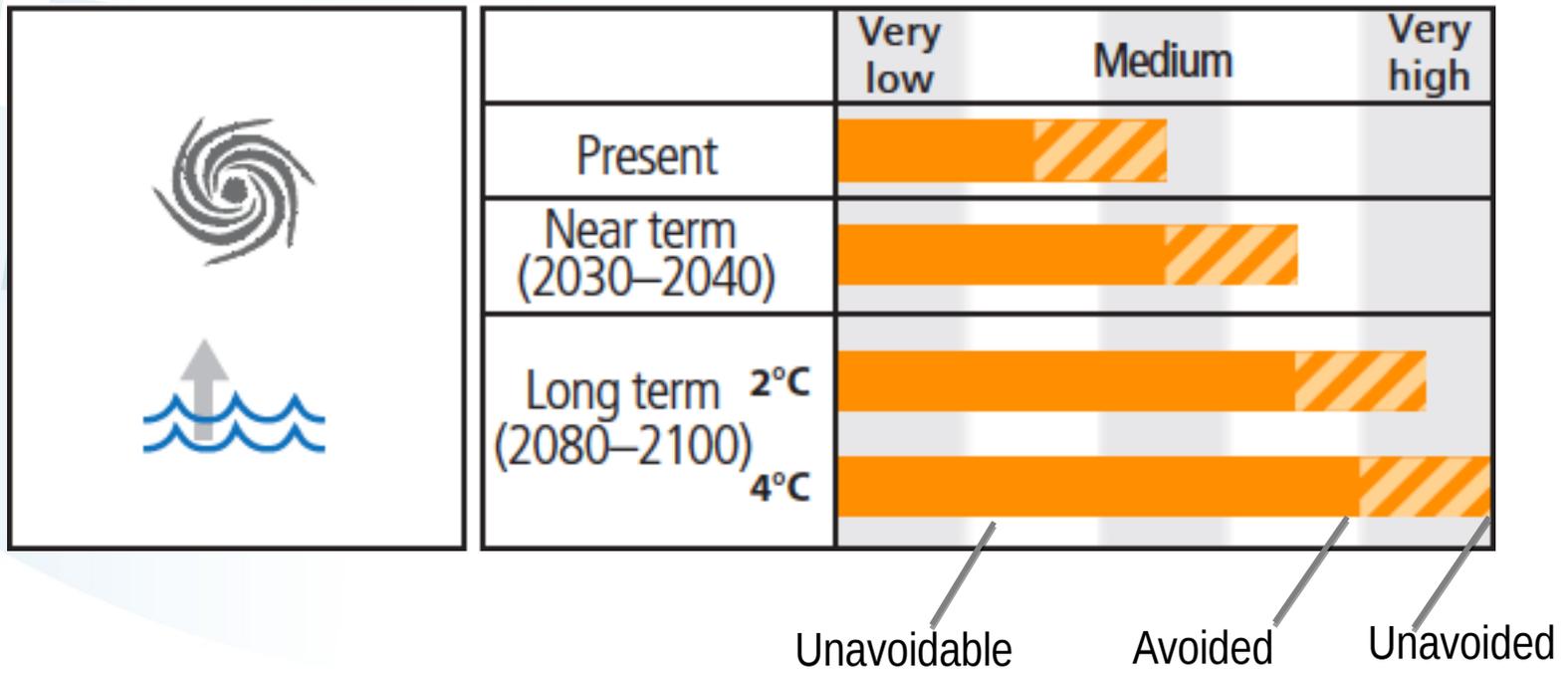


Sea surface temperature

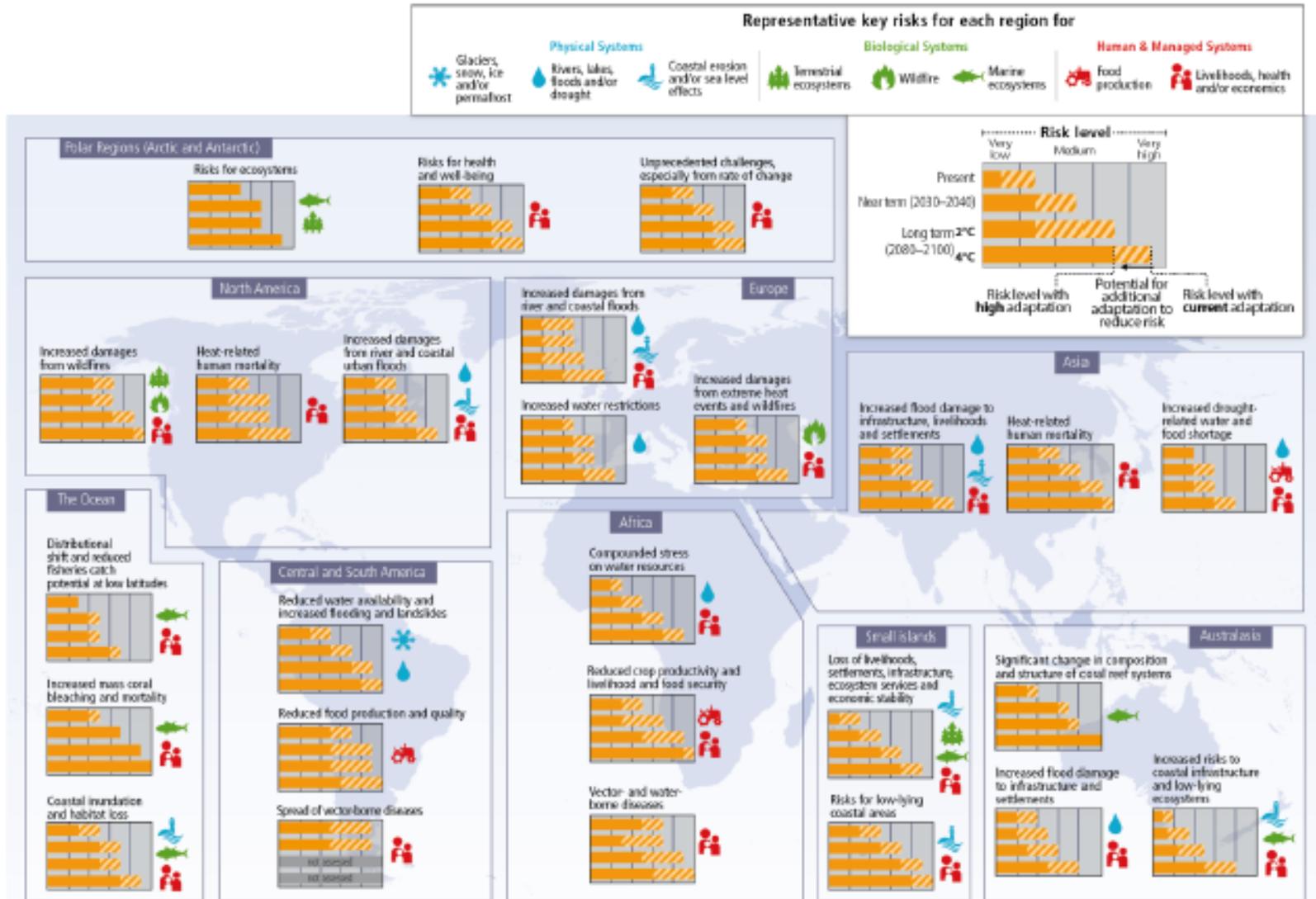
IPCC Risk language



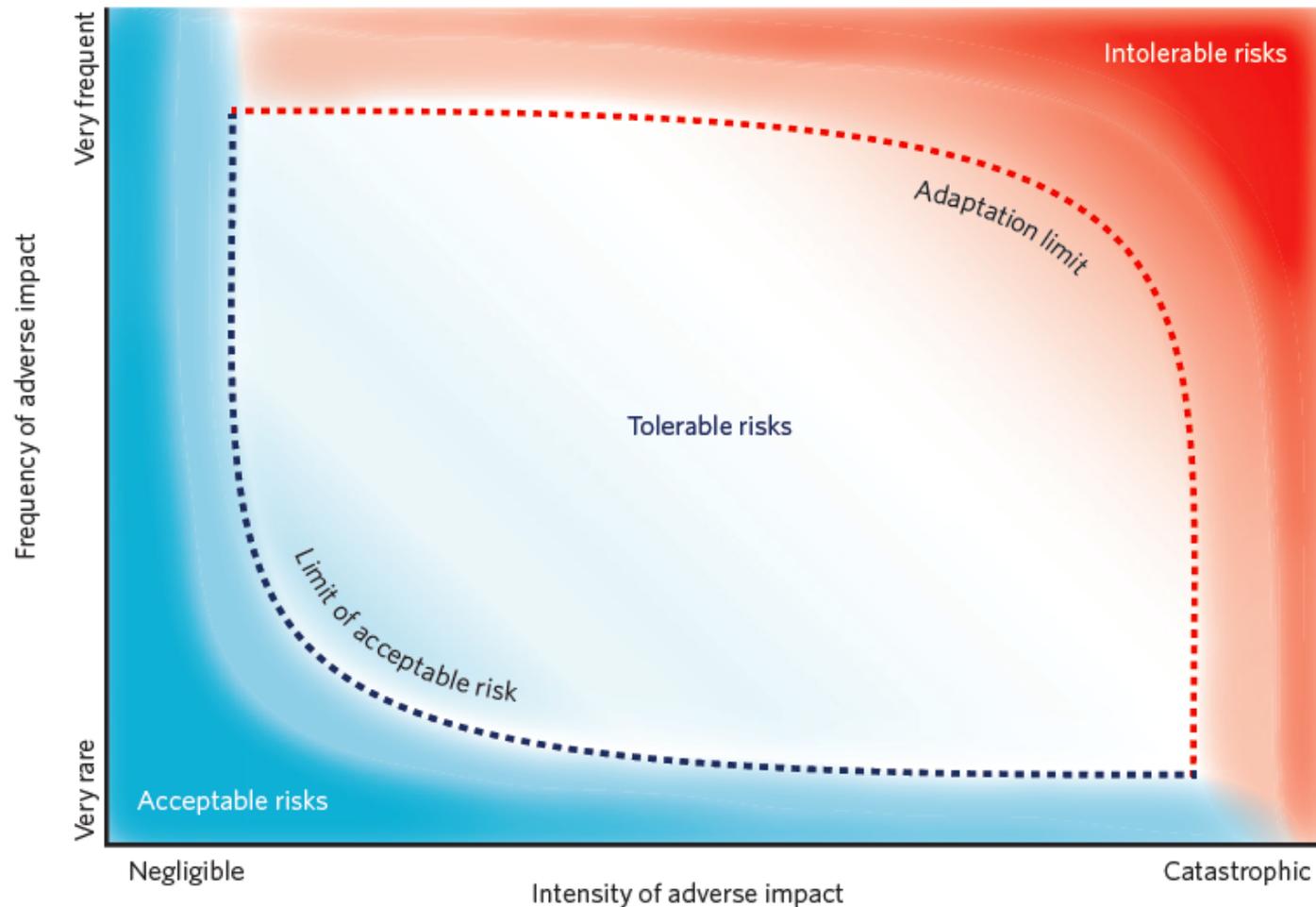
SIDS
Rising global mean sea level in the 21st century with high-water-level



Future risk: IPCC Working II regional climate risk analysis



2. Risk evaluation



Acceptable, tolerable and intolerable risks

Dow et al. 2013b after Klinke and Renn 2002; Renn and Klinke 2013)

3. Climate Justice

- Identifying roles and responsibilities for dealing with risks involves attention to climate justice principles
- *Compensatory justice*
 - Polluter-pays principle,
 - due to the unequal distribution of historical and current emissions, as well as potential irreversible loss,
 - attributing impacts to anthropogenic climate change and identifying harm-doing.
- *Distributive justice*
 - Burden sharing necessary as many vulnerable countries in need of international support for tackling today's adaptation deficits
 - Does not require climate attribution of past, present and future risks for generating international support, such as provided via the Global Facility for Disaster Risk Reduction (GFDRR).

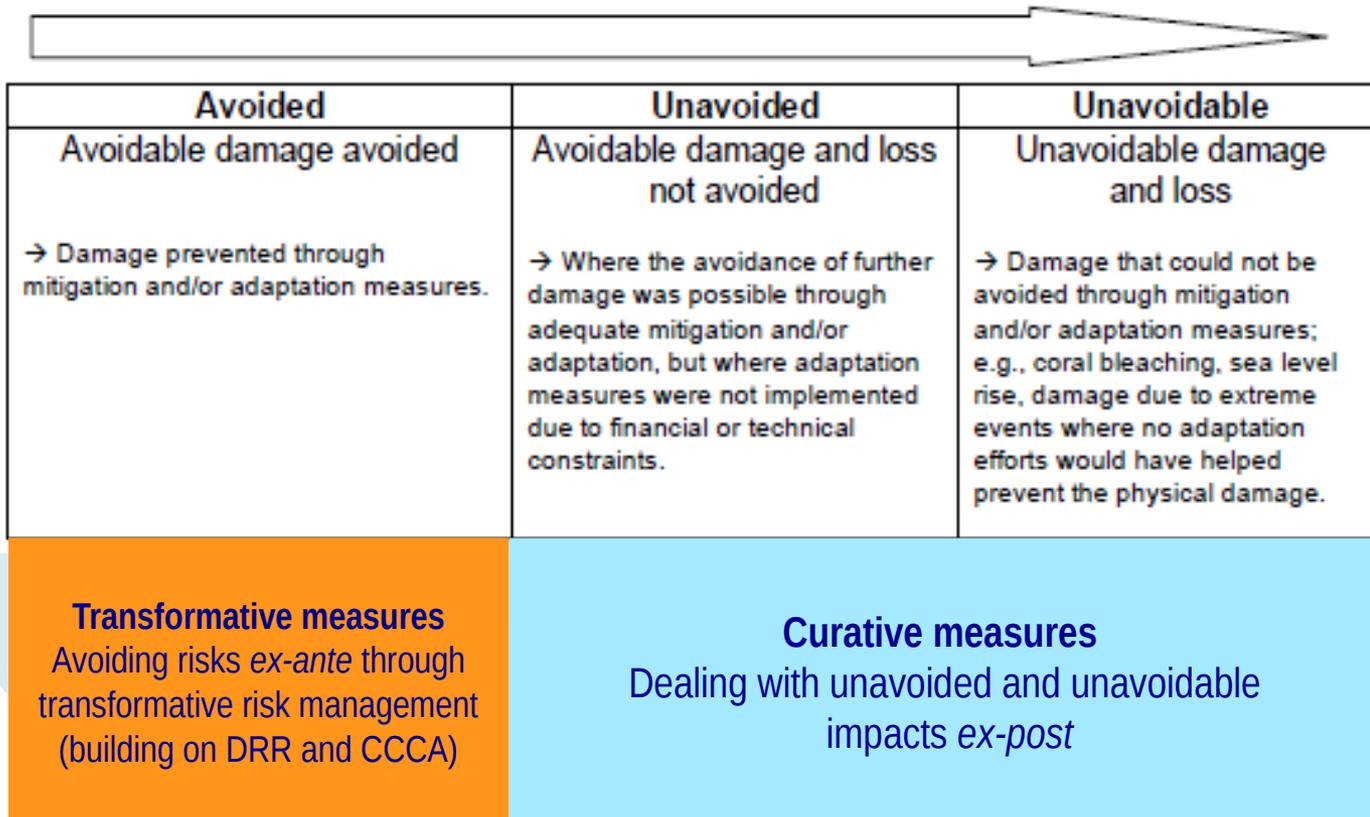
Options space: Curative options

- Support increasing costs attributable to climate change (e.g., coastal defense)
- National-level L&D mechanisms/pools being set-up: Bangladesh, Philippines etc.
- Yet, many risks non-monetary and immaterial
- Displacement coordination facility:
 - Legal protection by international law and finance for forced migration
 - Nansen Initiative: state-led effort for tackling disaster-induced cross-border displacement

Options space: Transformative measures for risk management

- Debate largely on insurance
 - Pooling and sharing risks to diversify risks integrated with a broader view towards comprehensive DRM and building resilience
 - Innovative instruments involving Public Private Partnerships
- Livelihood transformation (+up-side risk taking, .e.g. Eastern Africa)
- Migration
- Building resilience throughout while aligning with SDGs

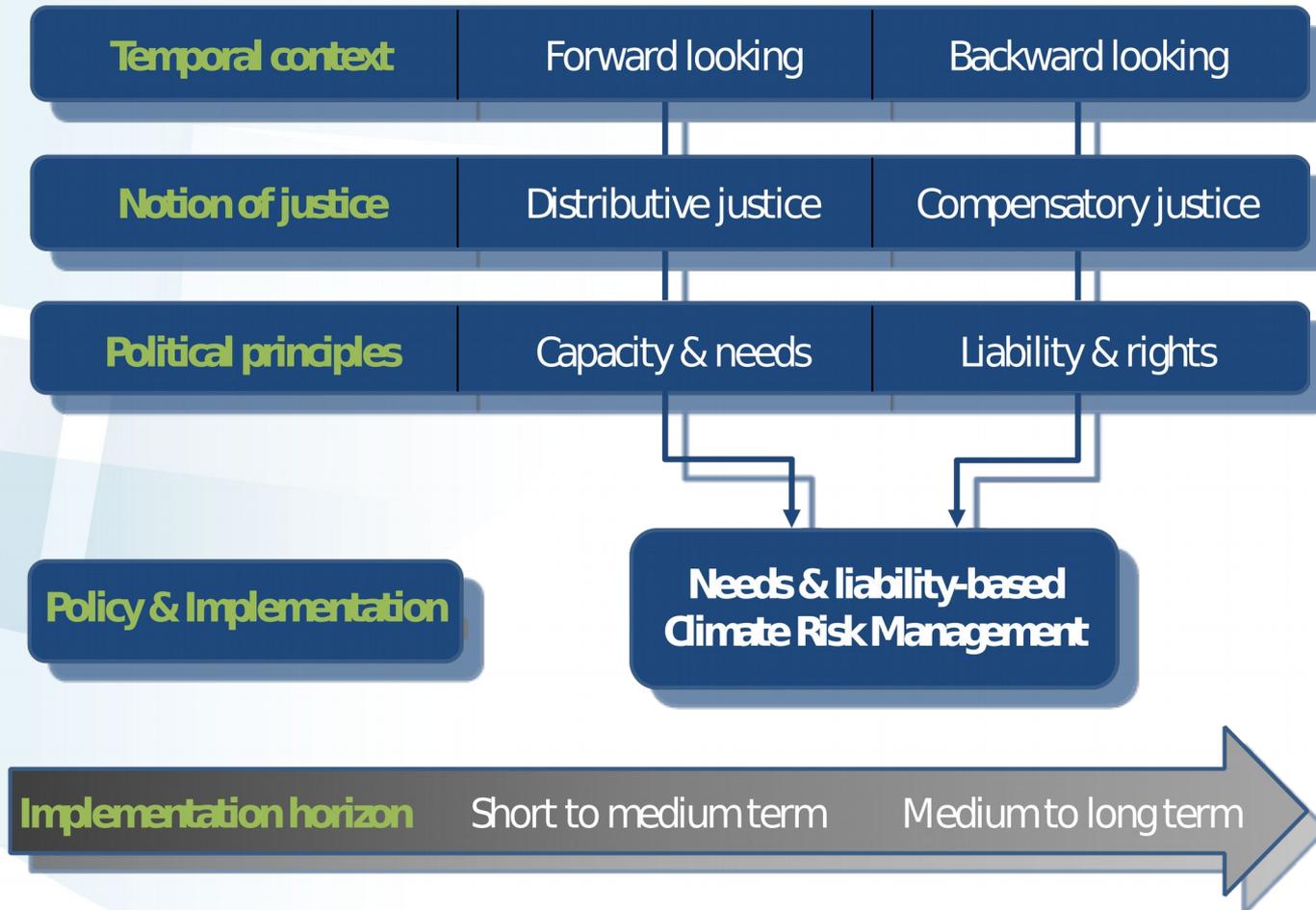
What are the risks we are talking about and what set of measures can be used?



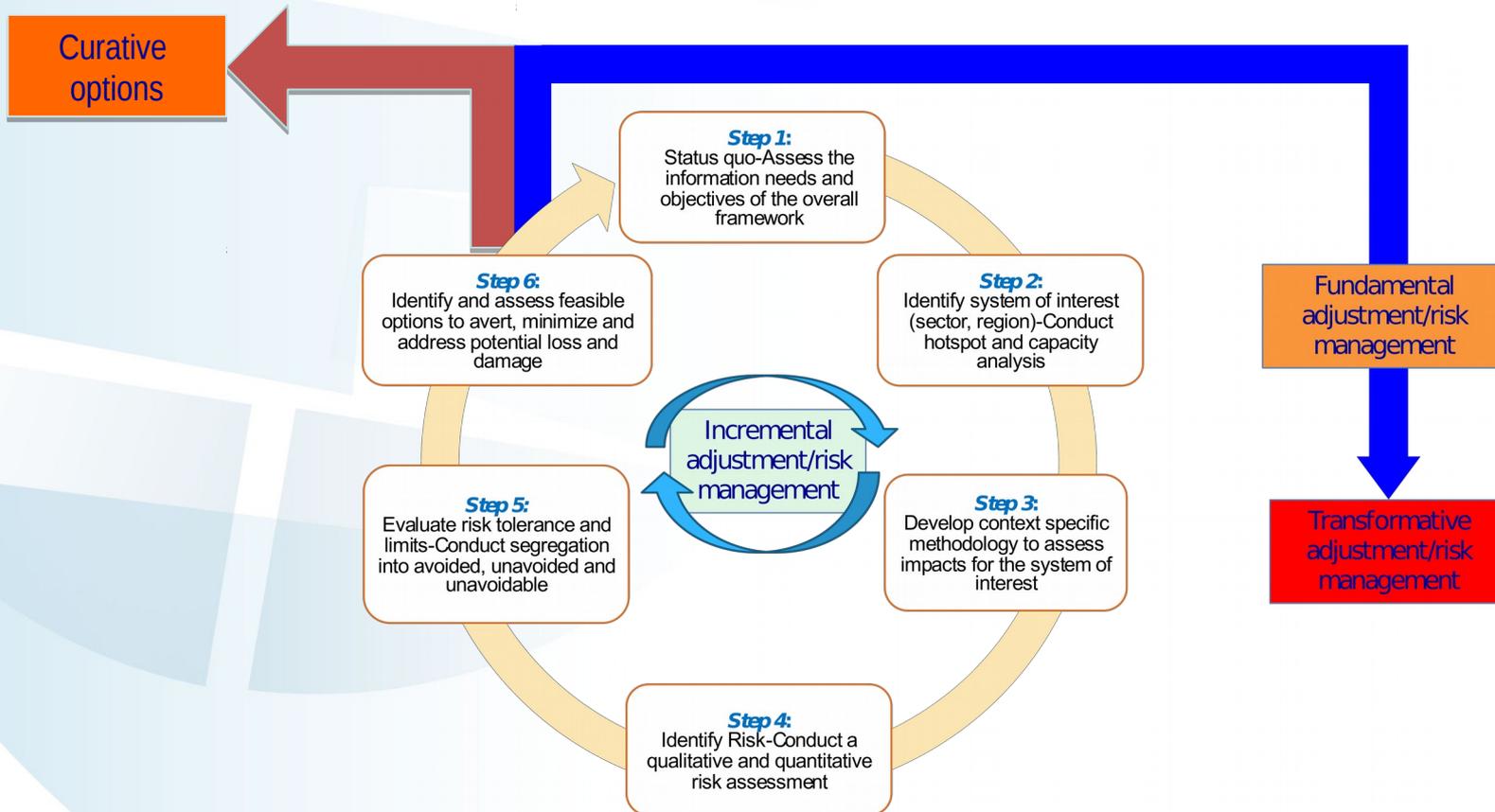
Source: Verheyen, 2008

Mechler and Schinko, 2016

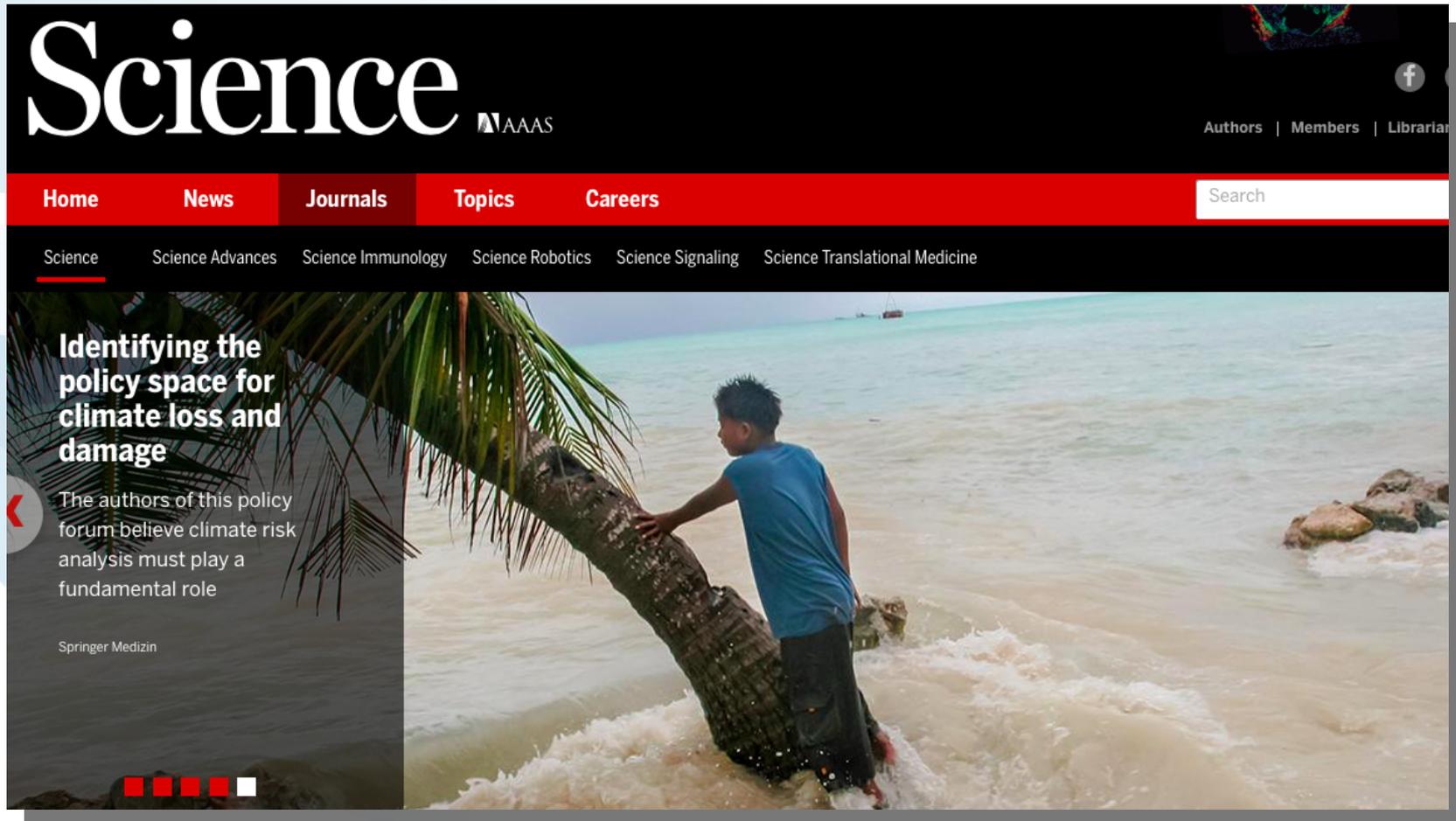
A broad climate risk analytical perspective



Process for operationalisation



Risk and Policy space for the Small Island States



The image shows a screenshot of the Science journal website. The top navigation bar is black with the "Science" logo in white and the AAAS logo to its right. On the far right of the top bar are social media icons for Facebook and YouTube, and links for "Authors", "Members", and "Librarian". Below this is a red navigation bar with white text for "Home", "News", "Journals", "Topics", and "Careers". A search bar is located on the right side of this bar. Underneath the red bar is a black bar with white text for "Science", "Science Advances", "Science Immunology", "Science Robotics", "Science Signaling", and "Science Translational Medicine". The main content area features a large photograph of a young boy in a blue shirt standing on a beach, leaning against a fallen palm tree trunk. The water is turbulent and brown, suggesting a storm or high tide. Overlaid on the left side of the image is a text box with a white background and black text. The text reads: "Identifying the policy space for climate loss and damage". Below this, in smaller text, it says: "The authors of this policy forum believe climate risk analysis must play a fundamental role". At the bottom left of the text box, it says "Springer Medizin". At the bottom left of the image, there is a small red arrow icon and a row of five colored squares (four red, one white).

Science AAAS

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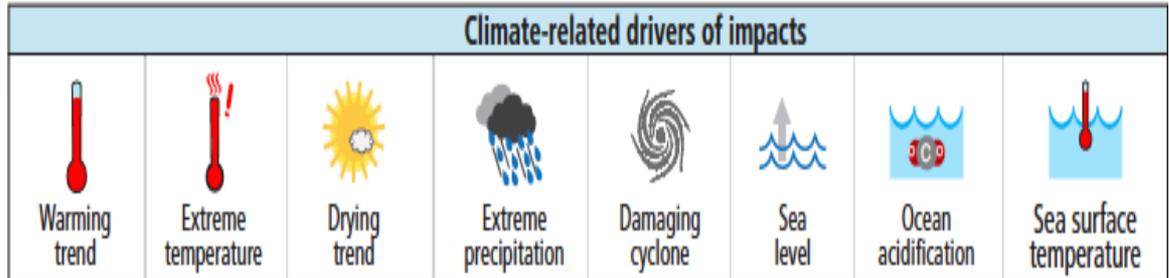
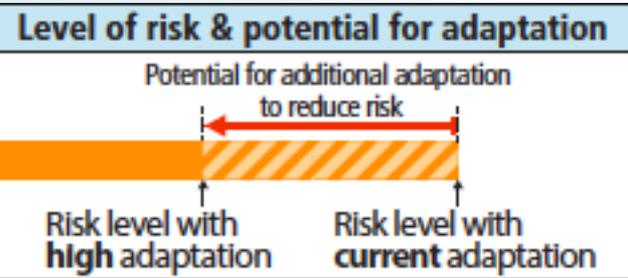
Science Science Advances Science Immunology Science Robotics Science Signaling Science Translational Medicine

Identifying the policy space for climate loss and damage

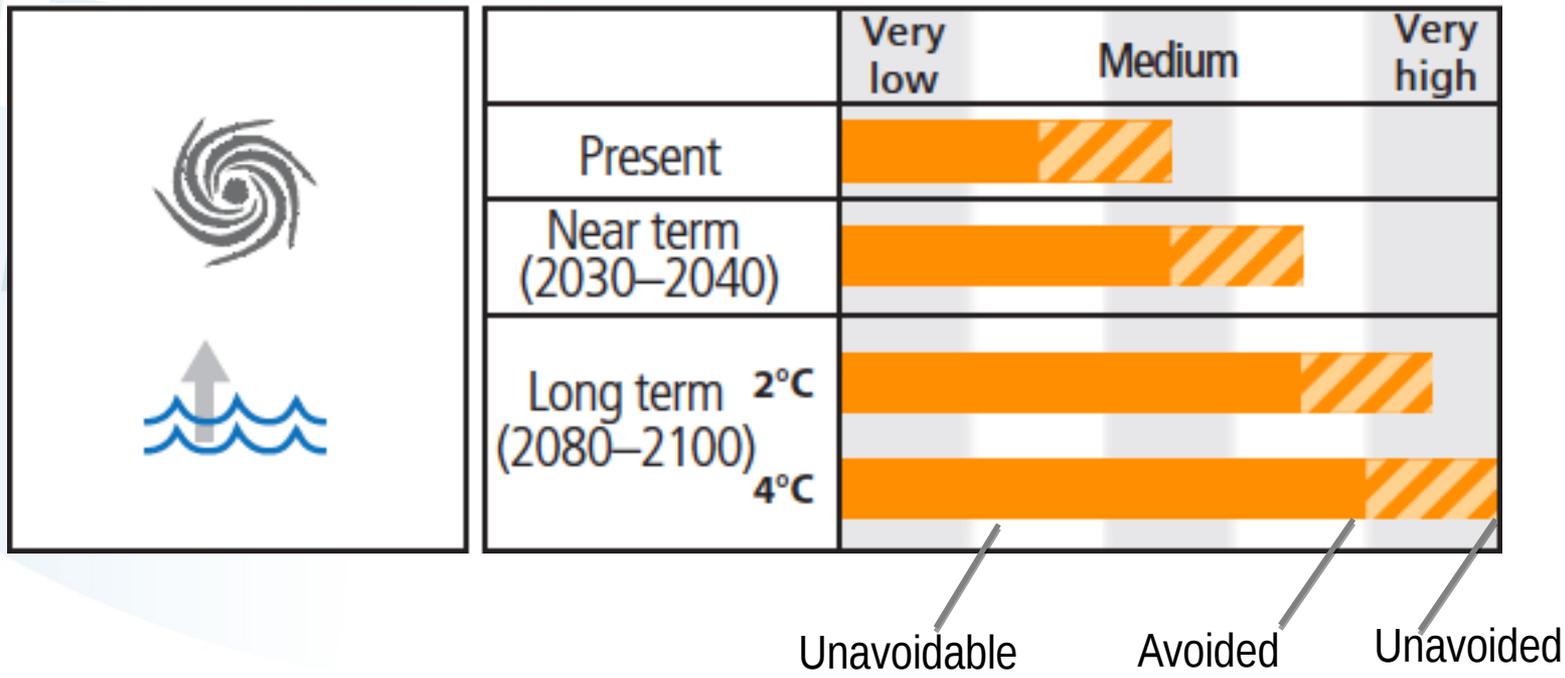
The authors of this policy forum believe climate risk analysis must play a fundamental role

Springer Medizin

Case 1: SIDS



SIDS
Rising global mean sea level in the 21st century with high-water-level



Risk space

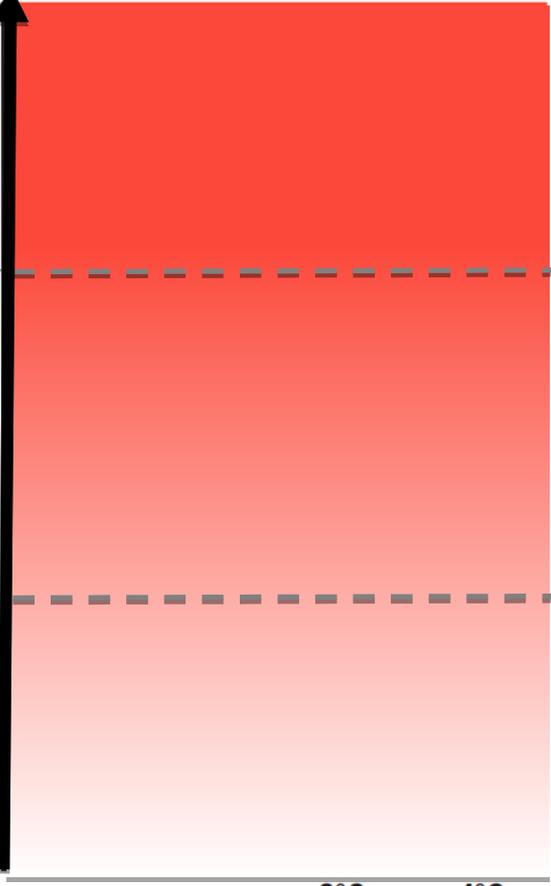
Very high

Intolerable

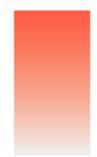
Tolerable

Acceptable

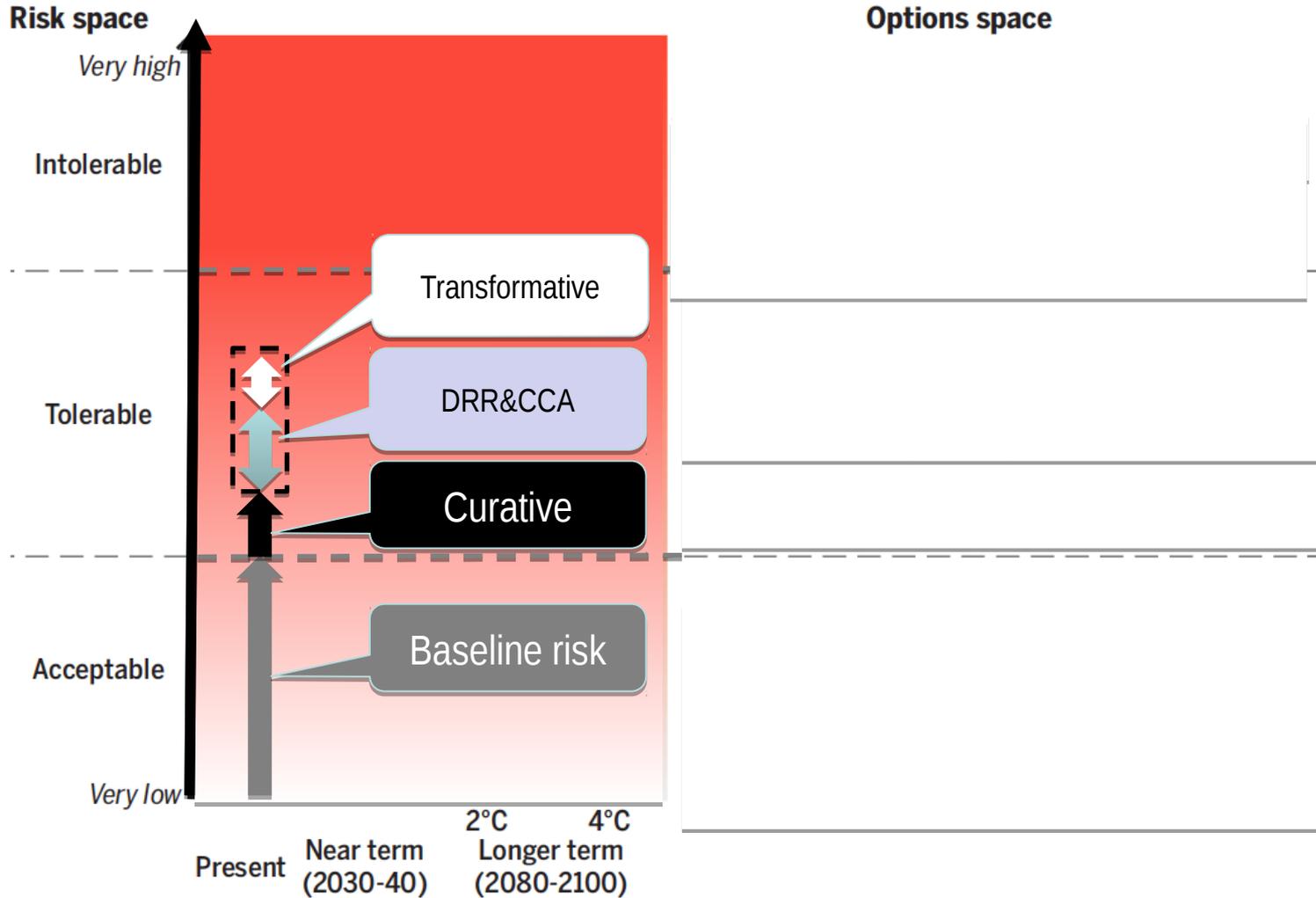
Very low



Present Near term (2030-40) 2°C 4°C
Longer term (2080-2100)



Residual risk

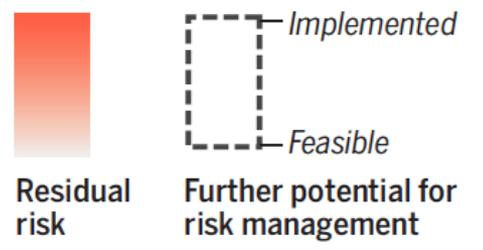
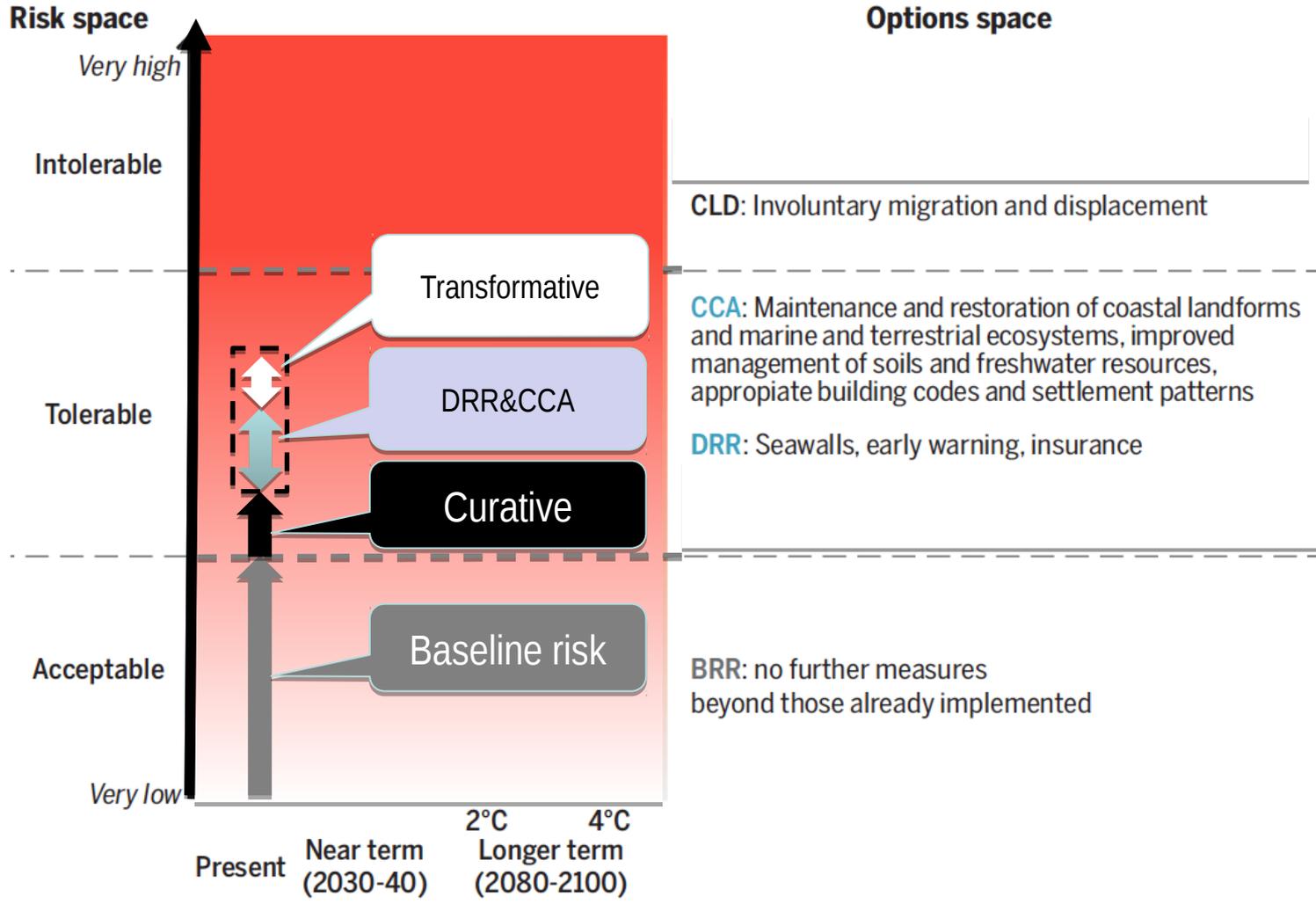


Residual risk

Further potential for risk management

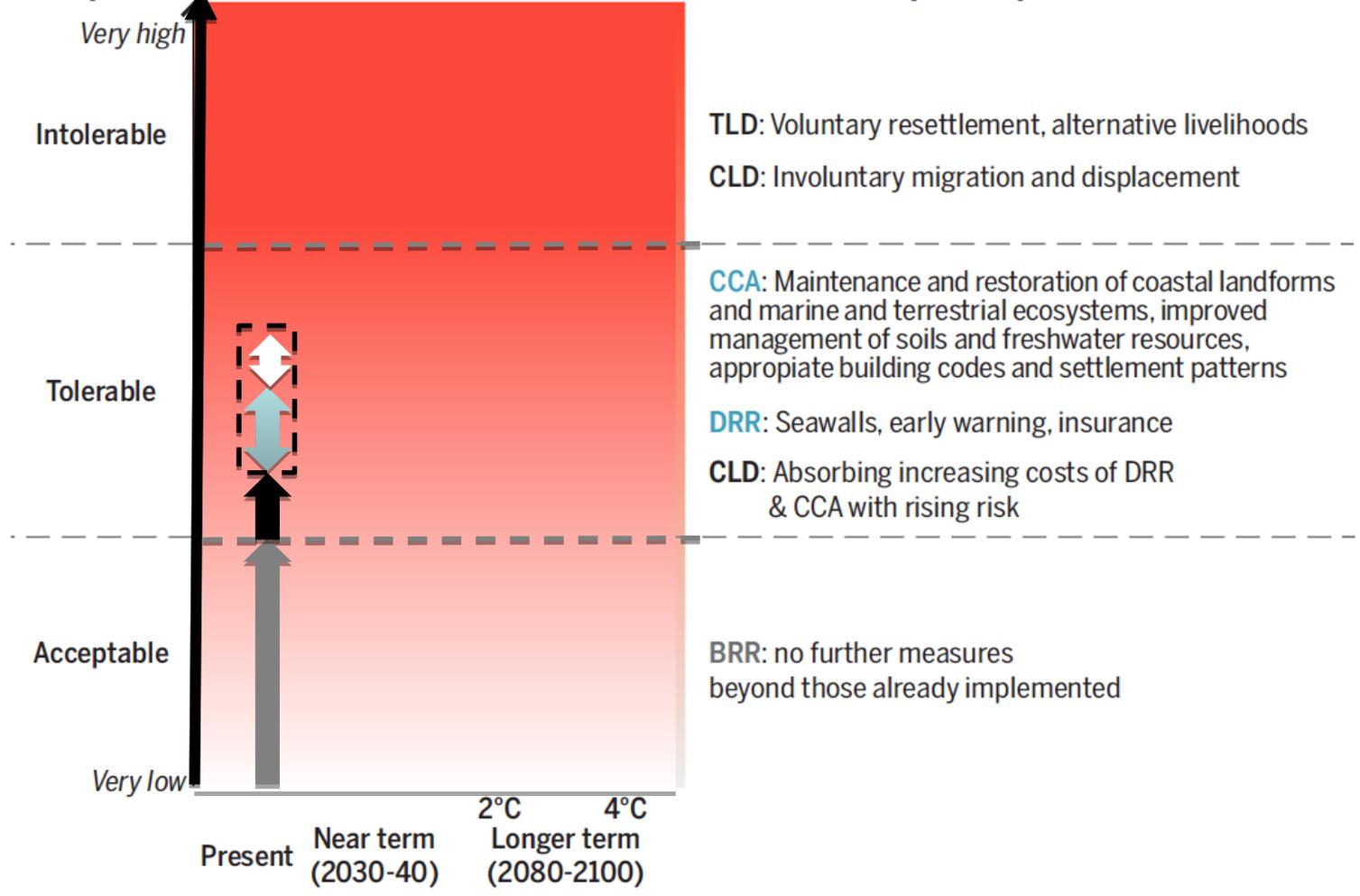
Implemented

Feasible



Risk space

Options space



 Residual risk

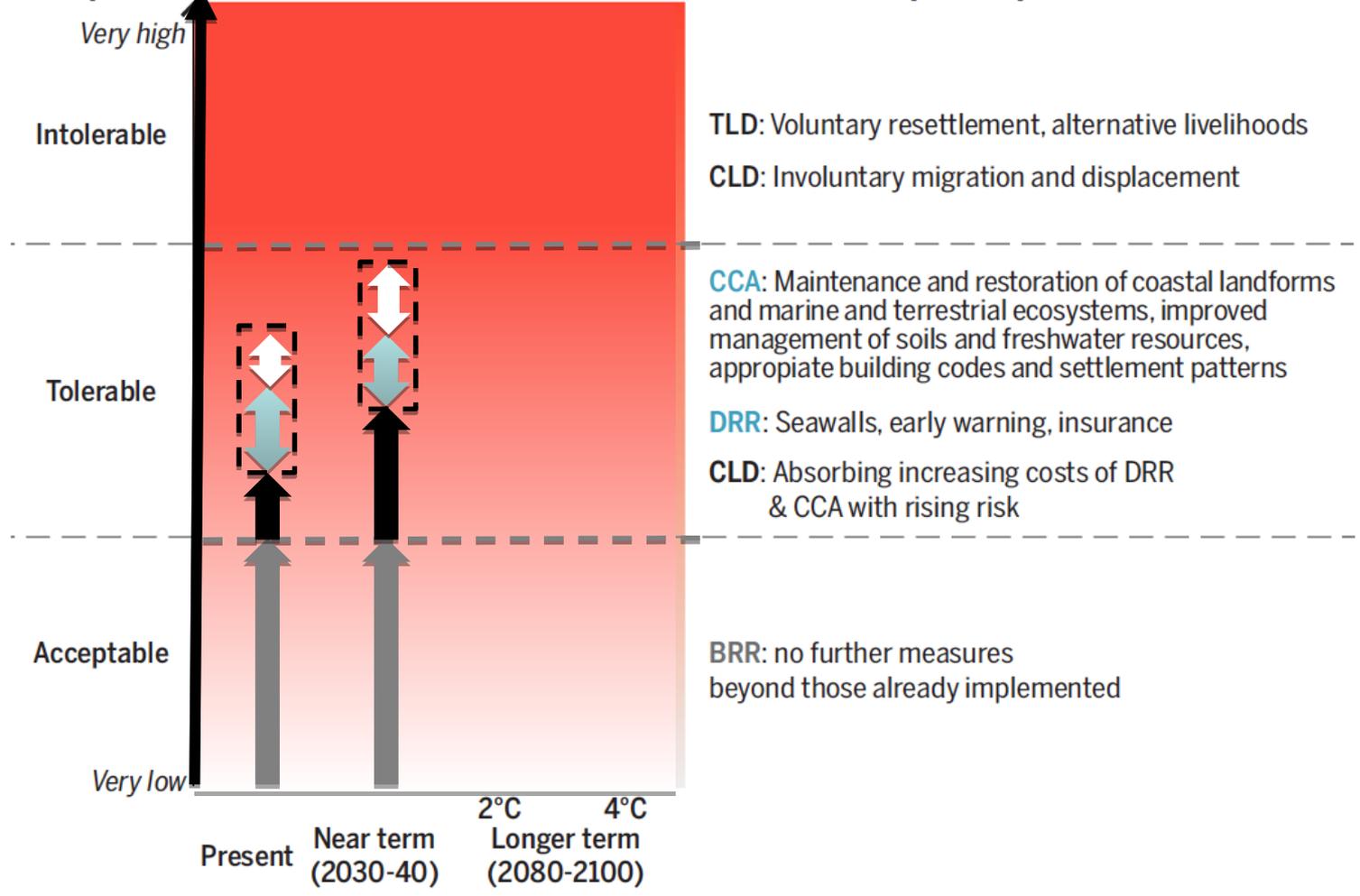
 Further potential for risk management

Implemented

Feasible

Risk space

Options space



 Residual risk

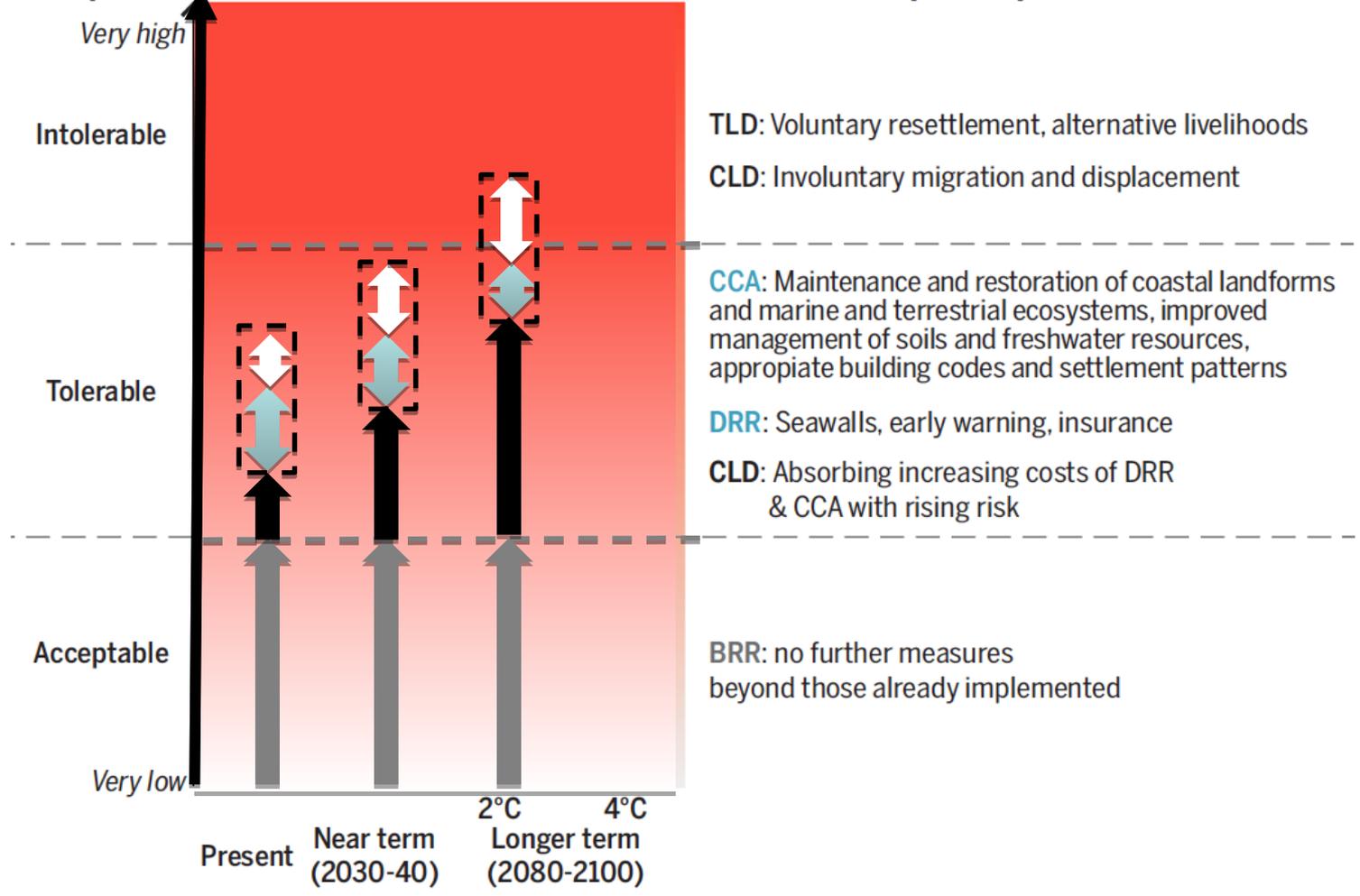
 Further potential for risk management

Implemented

Feasible

Risk space

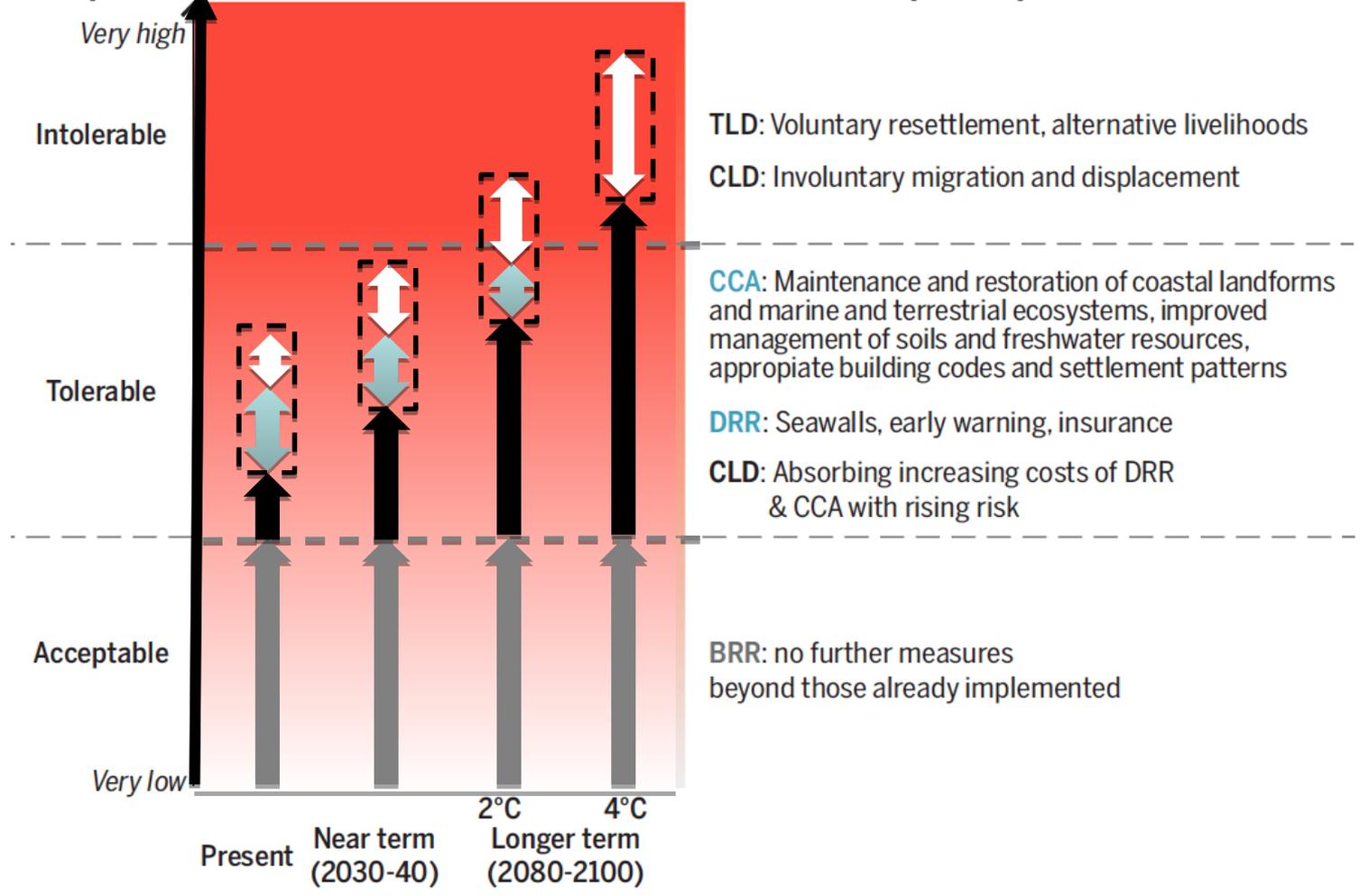
Options space



 Residual risk
 Further potential for risk management

Risk space

Options space



TLD: Voluntary resettlement, alternative livelihoods
 CLD: Involuntary migration and displacement

CCA: Maintenance and restoration of coastal landforms and marine and terrestrial ecosystems, improved management of soils and freshwater resources, appropriate building codes and settlement patterns

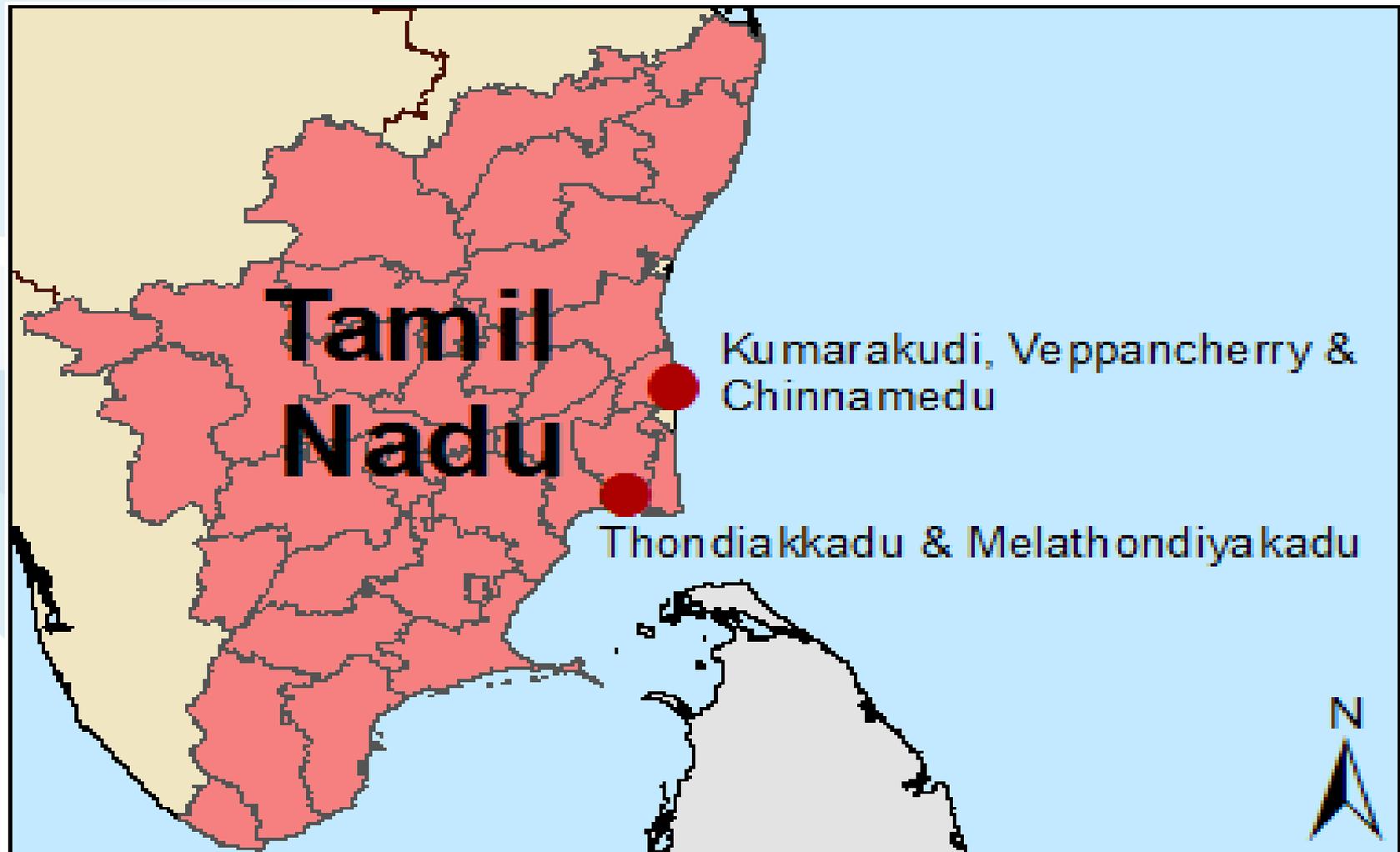
DRR: Seawalls, early warning, insurance

CLD: Absorbing increasing costs of DRR & CCA with rising risk

BRR: no further measures beyond those already implemented

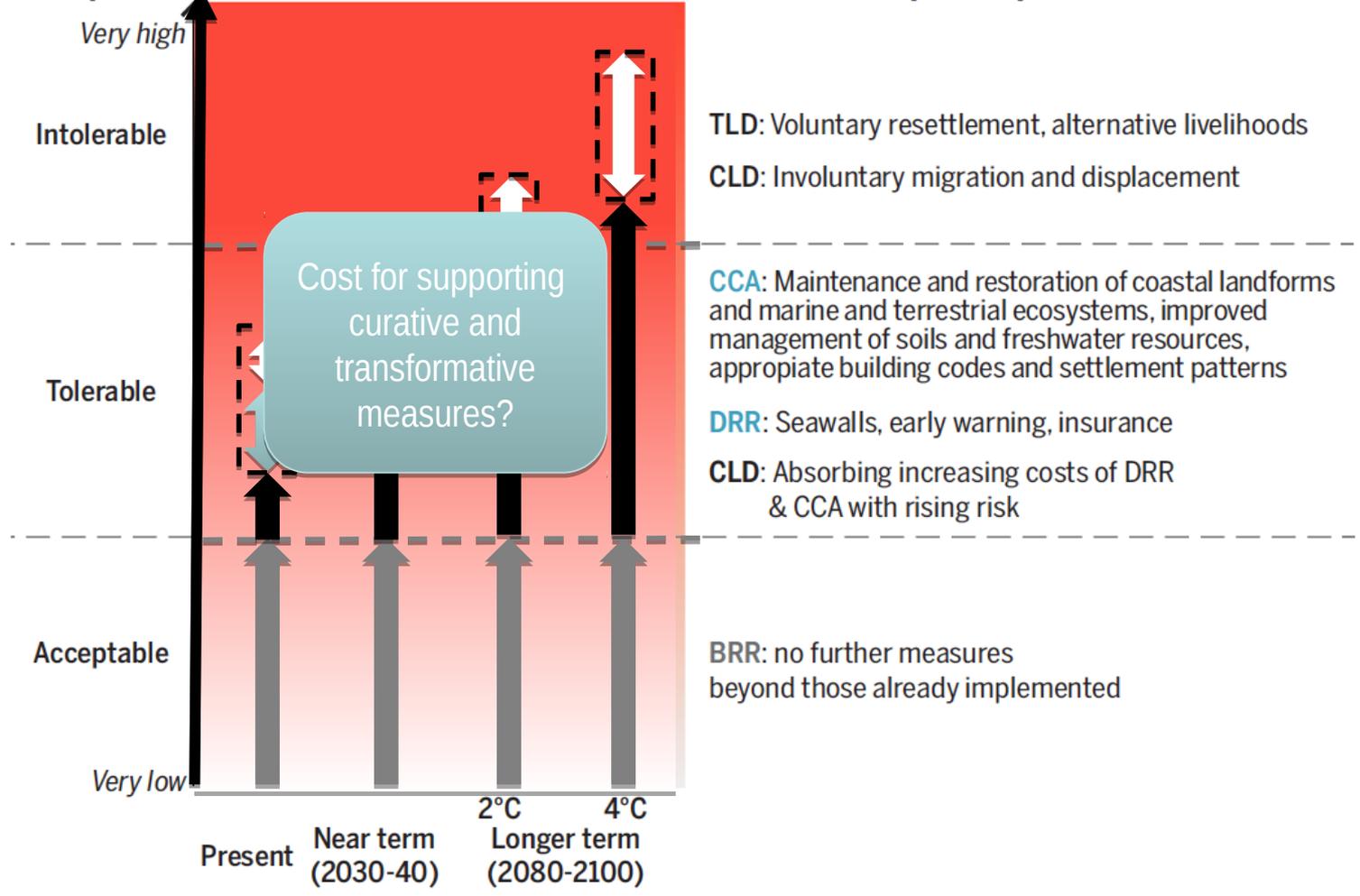
 Residual risk
 Feasible
 Further potential for risk management

Case 2: Local level risk and options space in Tamil Nadu (cyclones and salinization)



Risk space

Options space



- Transformative Loss & Damage (TLD)
- Curative Loss & Damage (CLD)
- Climate Change Adaptation (CCA) & Disaster Risk Reduction (DRR)
- Baseline Residual Risk (BRR)

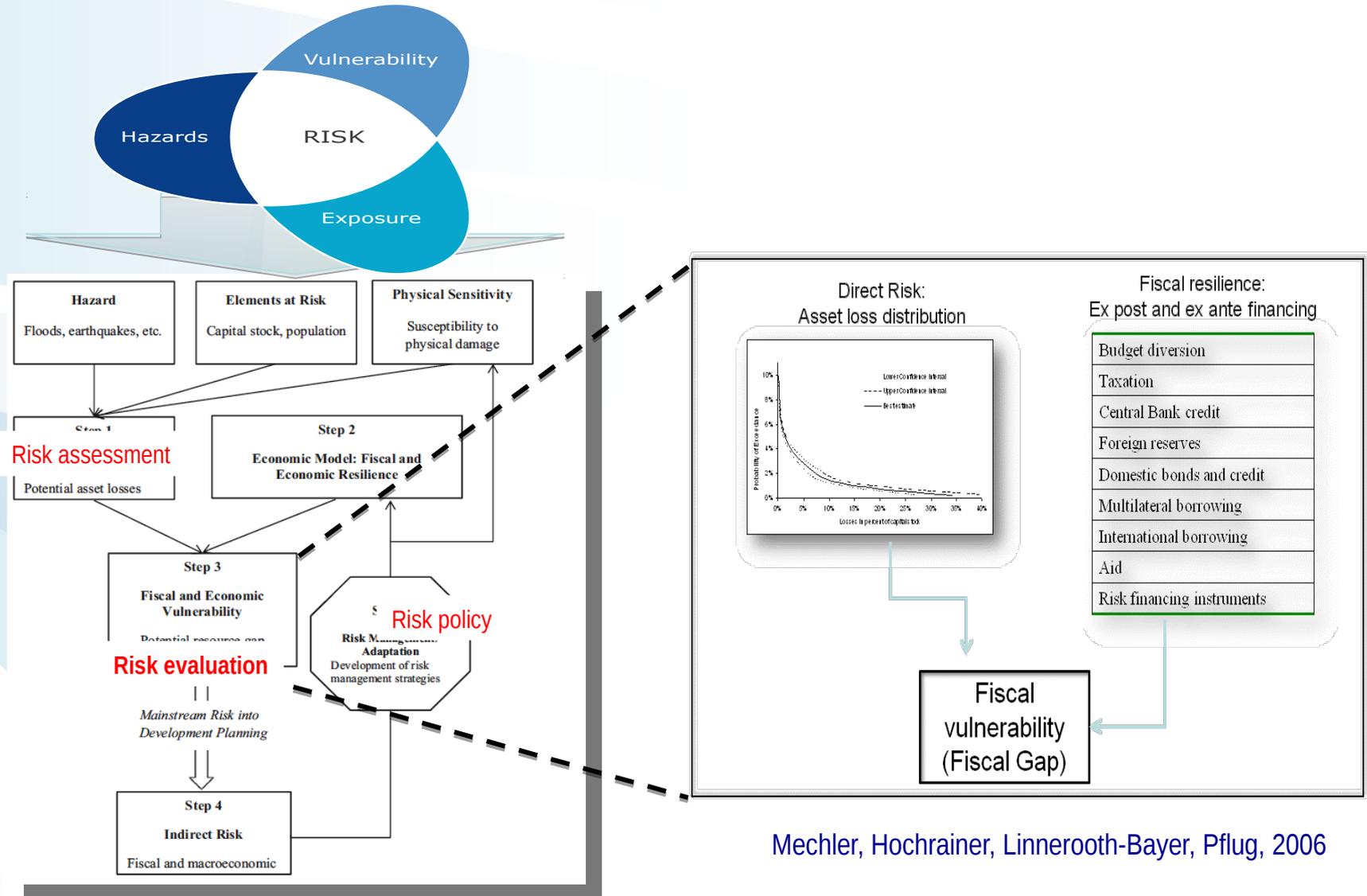
Residual risk

Implemented

Feasible

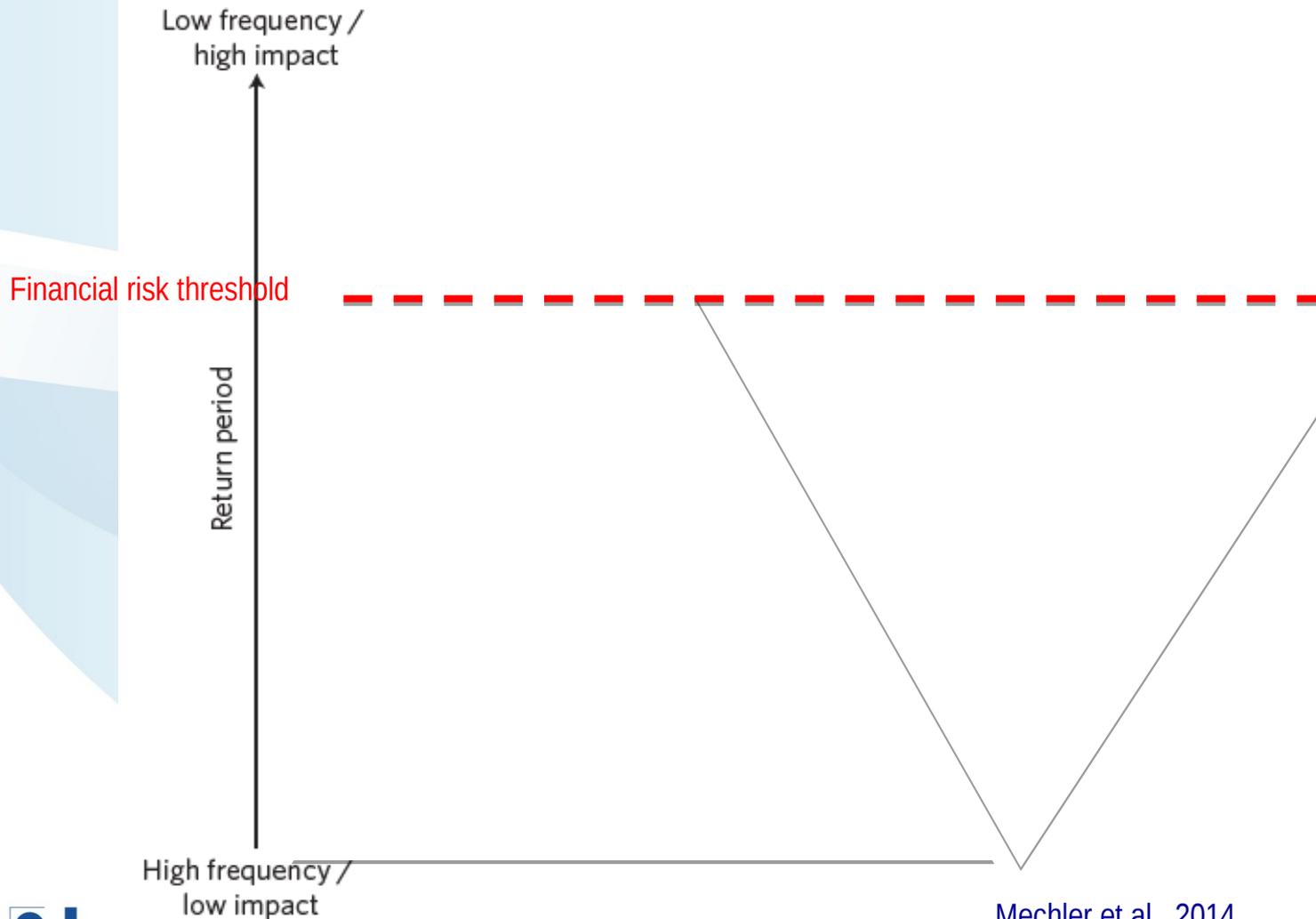
Further potential for risk management

Case 3: Bangladesh Model-based analysis CATSIM model

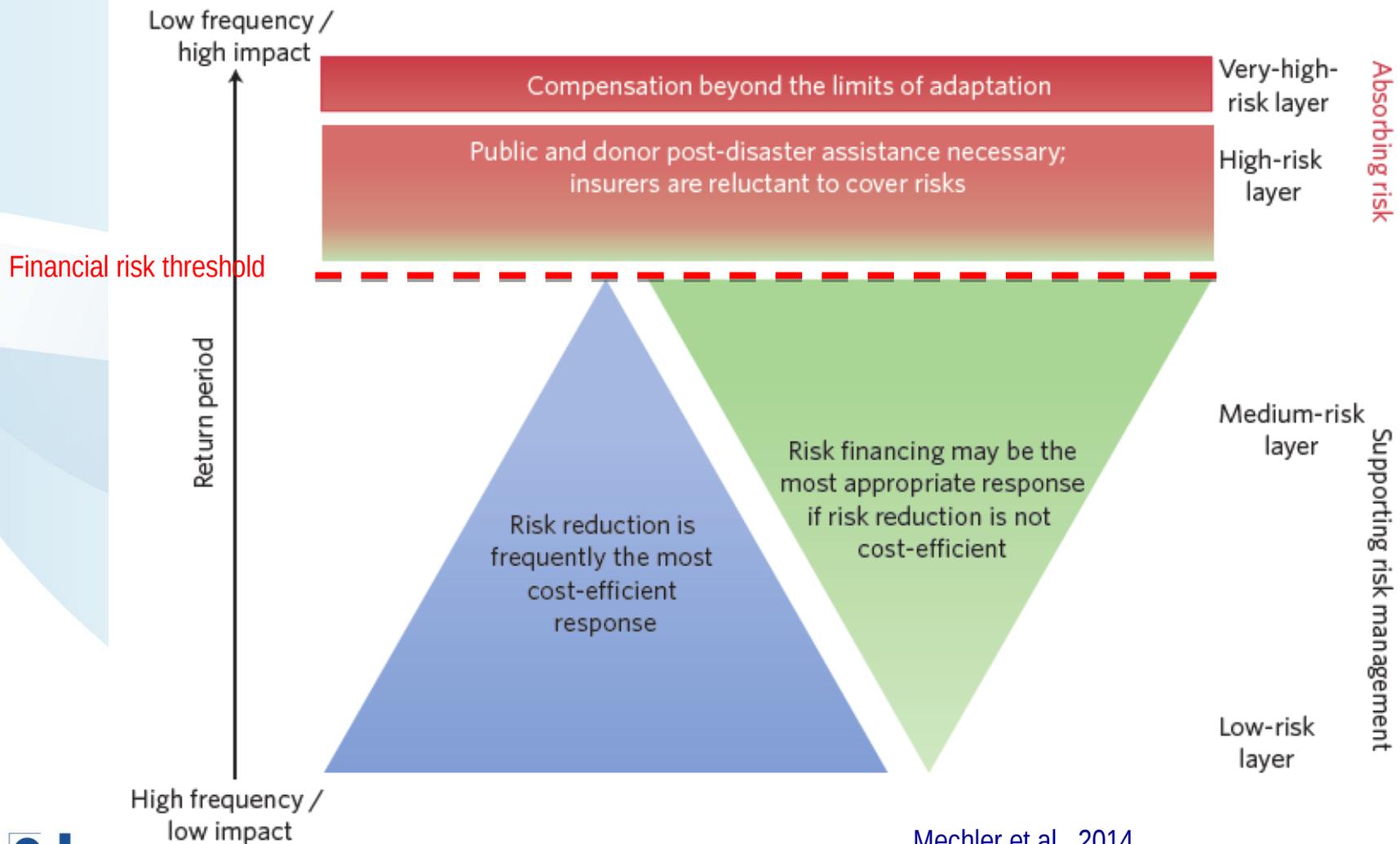


Mechler, Hochrainer, Linnerooth-Bayer, Pflug, 2006

Risk evaluation: risk layering

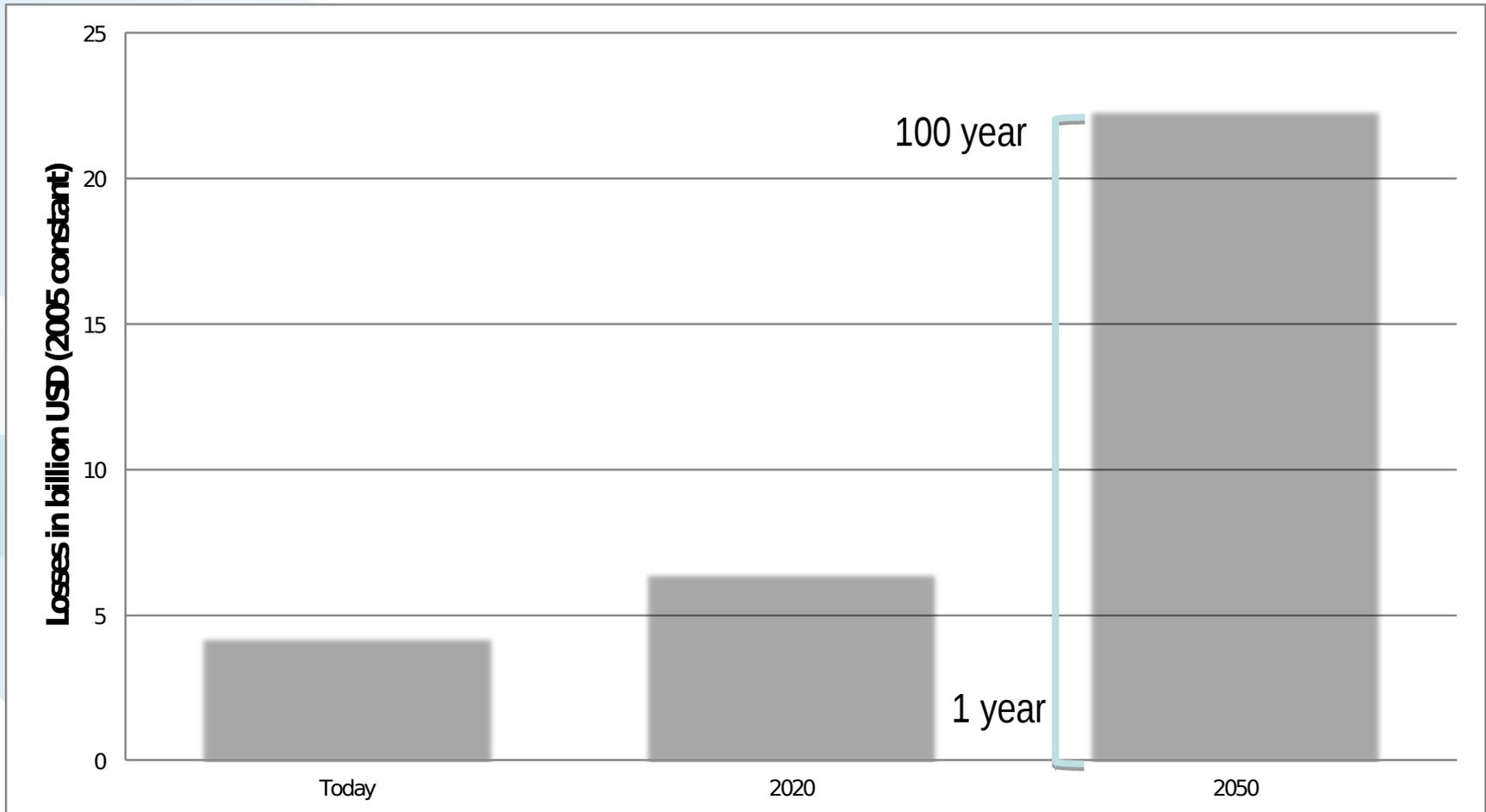


Risk evaluation: risk layering



Case 3: Bangladesh

Future risks and liabilities



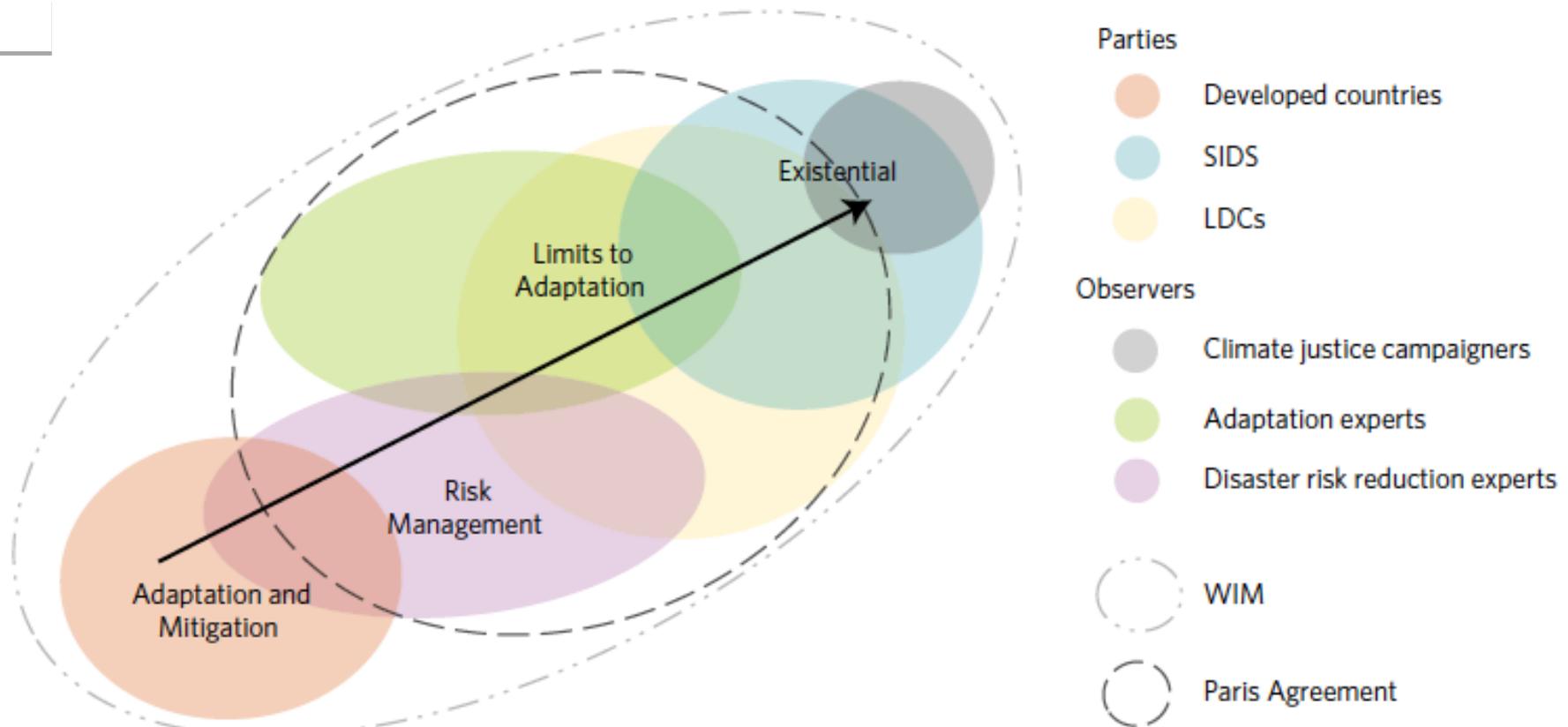
Risk layers with climate change
(B1 scenario and no additional risk reduction)

Based on Mechler and Bouwer, 2015

Epilogue: from symbolic to real action?

- Broad risk management (governance) approach as boundary device
- Aligning compensatory and distributive justice considerations for a step change beyond symbolic action
- L&D as link to SDG debate: Transformative risk management
- L&D to provide compensatory justice where attribution possible: curative component
- L&D as “Canary in the coal mine:” Avoid dangerous interference with the climate system

Risk management as boundary domain of analysis and action?



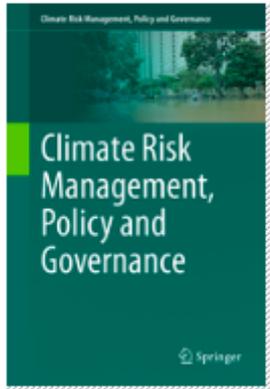
Boyd et al., 2017

Loss and Damage research network

Members' institutional affiliations



Upcoming book



Climate Risk Management, Policy and Governance

Series Editors: **Mechler**, Reinhard, **Surminski**, Swenja

ISSN: 2510-1390



ABOUT THIS SERIES

TITLES IN THIS SERIES

This book series is devoted to the growing body of studies that provide analytical insight for policy-making and implementation for bridging climate change adaptation, disaster management and development sectors. It is reflective on all aspects of the climate risk management process, including assessment, mapping, identification, communication, implementation, governance and evaluation of climate risks and management responses.

Topics may span across global, national, regional, sectoral and local scales. The series invites multi-disciplinary and transdisciplinary approaches, combining insights from natural science, engineering and social sciences; emphasizing existing gaps, particularly in the area of decision-making, governance and international relations.

The series furthermore offers both theoretical and practical contributions, with the aim to further academic study and thinking, as well as advancing policy making and implementation of climate risk management processes and tools.

Fall 2017 Book #2:
Mechler, Bouwer, Linnerooth-Bayer, Schinko, Surminski
"Loss and Damage from Climate Change. Concepts, Principles and Policy Options." *Springer*

Some publications

- Mechler, R. (2017). Transparency for Loss and Damage. *Nature Climate Change* 7, 687–688
- Schinko, T. and Mechler, R. (2017). Applying Recent Insights From Climate Risk Management to Operationalize the Loss and Damage Mechanism. *Ecological Economics* 136: 296-298. doi:10.1016/j.ecolecon.2017.02.008.
- Mechler, R. and T. Schinko (2016). Identifying the policy space for climate loss and damage. *Science* 354 (6310), 290-292
- Mechler R. and Bouwer, L. (2015). Reviewing trends and projections of global disaster losses and climate change: Is vulnerability the missing link? *Climatic Change* 33 (1) : 23-35