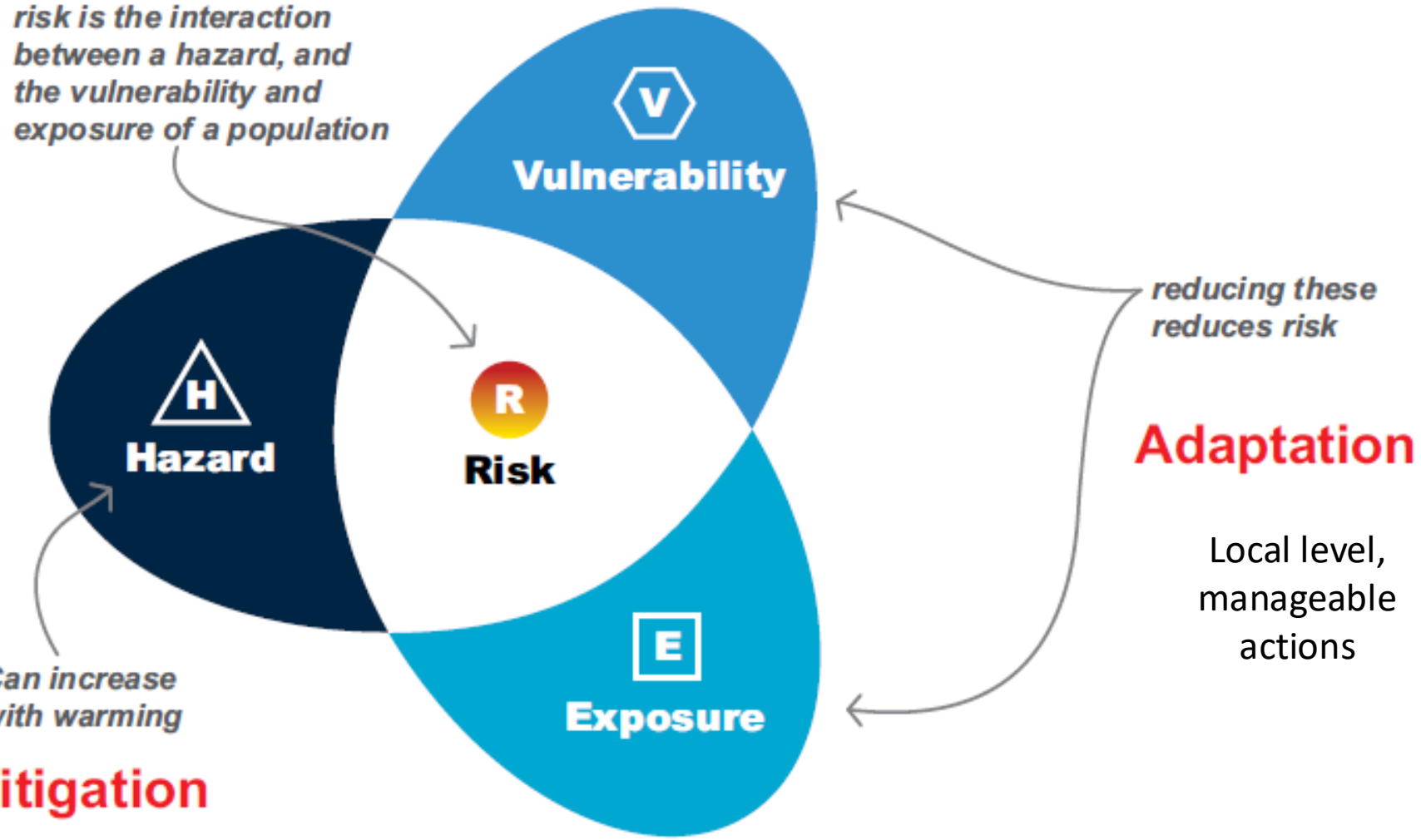
Mitigation, Adaptation and Loss and Damage

Lecture 21



Risks arising from climate change impacts resulting from dynamic interactions (adapted from IPCC Risk Framework (IPCC, 2014)

Mitigation

- **Climate mitigation** refers to efforts to reduce or prevent the emission of greenhouse gases (GHGs) into the atmosphere, thereby limiting the magnitude of climate change. It focuses on addressing the root causes of climate change by reducing emissions from human activities, enhancing carbon sinks, and adopting cleaner energy sources.
- **Examples of Climate Mitigation Measures:**
  - **Transitioning to Renewable Energy**: Replacing fossil fuels with wind, solar, hydro, or geothermal energy.
  - **Improving Energy Efficiency**: Enhancing energy use in transportation, buildings, and industries.
  - **Afforestation and Reforestation**: Expanding forests to absorb carbon dioxide (CO_2).
  - **Promoting Sustainable Agriculture**: Reducing methane emissions from livestock and adopting climate-smart farming techniques.
  - **Carbon Capture and Storage (CCS)**: Capturing CO_2 emissions from industrial processes and storing them underground.

Kyoto Protocol – commitment towards mitigation

- The **Kyoto Protocol**, adopted in **1997** and entered into force in **2005**, is an international treaty under the **United Nations Framework Convention on Climate Change (UNFCCC)**. It aimed to reduce greenhouse gas (GHG) emissions and mitigate climate change by establishing legally binding emission reduction targets for developed countries and economies in transition (Annex I and Annex II countries).
- Annex II : A subset of Annex I countries that are considered developed and wealthy, with greater capacity to assist developing nations.
- Non Annex countries (Developing Countries) were not a party to Kyoto Protocol

Key Features of the Kyoto Protocol

- **Emission Reduction Targets**:
  - Annex I & II countries committed to reducing their GHG emissions by an average of **5.2% below 1990 levels** during the **first commitment period (2008-2012)**.
- **Flexible Mechanisms**:
  To help countries meet their targets cost-effectively, the Kyoto Protocol introduced three market-based mechanisms:
  - **International Emissions Trading (IET)**:
    - Countries with excess emissions allowances (not exceeding their targets) could trade them with others.
    - This trading formed the basis of a carbon market.
  - **Clean Development Mechanism (CDM)**:
    - Annex I countries could invest in emission-reduction projects in developing countries and earn Certified Emission Reduction (CER) credits.
    - Examples include renewable energy projects or reforestation efforts.
  - **Joint Implementation (JI)**:
    - Annex I countries could earn Emission Reduction Units (ERUs) by financing emission-reduction projects in other Annex I countries.

- **Compliance Mechanisms**:
  - The treaty included systems for monitoring, reporting, and verifying emissions to ensure countries adhered to their commitments.
- **Second Commitment Period**:
  - The **Doha Amendment** extended the protocol to a second period (2013-2020), with updated targets. However, not all countries ratified the amendment, limiting its effectiveness.

Limitations of the Kyoto Protocol:

- **Exclusion of Major Emitters**: Developing countries, including major emitters like China (&India), did not have binding targets.
- **Non-Participation**: Some countries, like the United States, never ratified the protocol.
- Delay in implementation
- Although legal but there was no mechanism to take action
- The **Kyoto Protocol** was a significant step in international climate governance, but its limitations led to the adoption of the **Paris Agreement** in 2015, which focuses on a more inclusive and flexible approach to global climate action.

Paris Agreement

- The **Paris Agreement**, adopted in **2015** at the 21st Conference of the Parties (COP21) to the **UNFCCC**, is a landmark international treaty aimed at combating climate change. It builds on the Kyoto Protocol but includes all nations, recognizing the need for a global and collective response to climate change.
- It marks a shift toward a **bottom-up approach**, where nations determine their own contributions based on their circumstances.
- The demarcation – Annex and Non Annex was kind of diluted

Key Objectives:

- **Temperature Goal**:
  - Limit global warming to **well below 2°C** above pre-industrial levels.
  - Aim to pursue efforts to limit the increase to **1.5°C** to reduce climate risks.
- **Global Emission Reductions**:
  - Achieve global peaking of greenhouse gas emissions as soon as possible.
  - Attain **net-zero emissions** by the second half of the 21st century.
- **Adaptation and Resilience**:
  - Strengthen the ability of countries to adapt to climate change impacts.
  - Enhance climate resilience and lower greenhouse gas emissions without threatening food production.
- **Finance and Support**:
  - Developed countries commit to mobilizing **$100 billion annually** to assist developing nations with mitigation and adaptation.
  - Facilitate technology transfer and capacity-building.

Unique Features:

- **Nationally Determined Contributions (NDCs)**:
  - Each country submits its own climate action plan (NDC), outlining targets and strategies for reducing emissions.
  - NDCs are reviewed and updated every **5 years**, aiming for greater ambition over time.
- **Global Stocktake**:
  - A periodic review of collective progress toward meeting the agreement's goals, conducted every **five years**.
- **Inclusive Approach**:
  - Unlike the Kyoto Protocol, the Paris Agreement applies to **all countries**, regardless of their economic status.
  - Recognizes the principle of **"common but differentiated responsibilities" (CBDR)** and capabilities.
- **Legally Binding Framework**:
  - While the framework is legally binding, the specific NDCs and targets set by countries are not.

Why Is There Insufficient Mitigation?

Economic Barriers:

- **Dependence on Fossil Fuels**: Many economies rely heavily on fossil fuels for energy, and transitioning to renewables requires significant investment.
- **Short-Term Costs vs. Long-Term Gains**: Governments and industries often prioritize economic growth and short-term benefits over long-term climate goals.

Political Challenges:

- **Lack of Global Cooperation**: While climate change is a global problem, mitigation requires collective action, which is often hindered by conflicting national interests.
- **Weak Policies and Enforcement**: Many countries lack stringent regulations or fail to enforce existing climate policies effectively.
- **Political Resistance**: In some regions, lobbying by industries such as coal and oil creates resistance to climate-friendly policies.

Social and Behavioral Barriers:

- **Low Public Awareness**: In many areas, people are unaware of the urgency or benefits of mitigation.
- **Resistance to Lifestyle Changes**: Mitigation often requires changes in consumption patterns, such as reducing energy use or switching to public transport, which face resistance.

Technological Constraints:

- **Access to Technology**: Developing nations may lack access to clean energy technologies or the capacity to deploy them.
- **Innovation Gap**: Some mitigation technologies, like carbon capture, are still in the early stages and expensive to scale.

Equity Issues:

- **Disparities Between Developed and Developing Nations**: Developing countries argue that developed nations, historically responsible for most emissions, should bear a larger share of the burden.
- **Lack of Climate Finance**: Insufficient funding for developing countries limits their ability to adopt mitigation measures.

Inertia and Delay:

- **Slow Policy Action**: Global agreements like the Paris Agreement lack the enforcement mechanisms to ensure countries meet their targets.
- **Lagging Implementation**: Even when policies are in place, implementation often falls behind due to bureaucratic hurdles or political shifts.

Consequences of Insufficient Mitigation:

- **Accelerated Global Warming**: Failure to mitigate leads to higher temperatures, intensifying extreme weather events.
- **Rising Sea Levels**: Insufficient mitigation increases the risk of irreversible changes to ecosystems and communities.
- **Greater Adaptation Challenges**: As mitigation efforts lag, adaptation becomes costlier and less effective in managing climate impacts.

Leading to Loss and Damage

What is adaptation?

- Adaptation is defined, in human systems, as the process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate this.
- Adaptation is much less developed than mitigation as a policy response (including technology and funds).
- The interest of the policy makers and the requirements of the negotiations have been largely directed to mitigation.
- The interest in adaptation as a response has been comparatively low and often absent, and to the extent that it was present at all, it was in the context of mitigation debates.

Two strands of research/ directions in understanding adaptation

- Impact led adaptation : probable net impact of climate change and how sectors need to adapt to reduce such impacts - need sophisticated models and deals with future climate change risk
- Vulnerability led adaptation : a bottom up approach, deals with current vulnerability and adaptation measures.

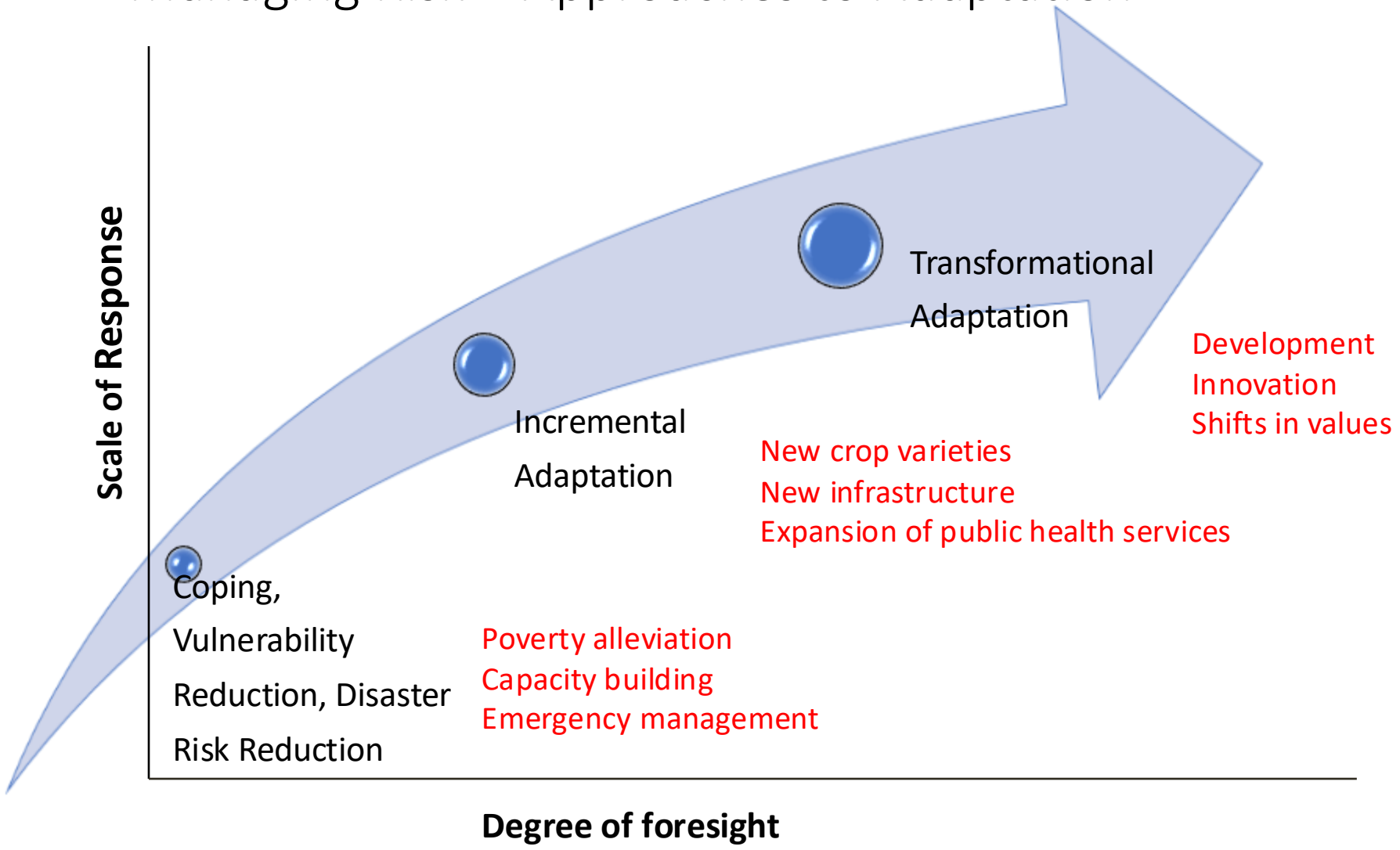
Impact led adaptation research gained most attention as climate change was / is considered to be a subject which deals with natural science and research is orientated towards the physical and biological science of impacts and adaptation.

The vulnerability research focuses was less attractive as it is focused on the social and economic determinants of vulnerability in a development context.

Why our understanding changed?

- More recently, the interest in adaptation as a legitimate policy response has increased, led by developing country negotiators.
- This has happened at least partly in response to a growing recognition that climate change is now occurring, impacts are being observed, and that even if fully implemented on time the Kyoto Protocol would only be a first small step towards achieving stabilisation of greenhouse gasses in the atmosphere.
- Some adaptation is now recognised as inevitable.
- The new challenge is to change the character of adaptation research from one that largely addresses the needs of the mitigation policy agenda, to one that also responds explicitly to the needs of adaptation policy.

Managing Risk – Approaches to Adaptation



Source: IPCC 2014

Limits to Adapation

- **Limits to adaptation** refer to the thresholds beyond which adaptation efforts are no longer effective, feasible, or sufficient to manage the adverse impacts of climate change. These limits can be classified into **soft limits** (barriers that can be overcome with changes in policy, technology, or resources) and **hard limits** (absolute thresholds beyond which adaptation is impossible, regardless of resources or strategies).

Hard Limit

Physical and Ecological Limits: Certain climate impacts, such as rising sea levels submerging low-lying islands or extreme heat making regions uninhabitable, may exceed the adaptive capacity of ecosystems and infrastructure.

- For example, coral reefs cannot adapt to ocean acidification and higher temperatures beyond a certain point, leading to irreversible loss.
- Small island nations facing rising sea levels may eventually need to abandon their lands, as physical and ecological adaptation becomes impossible.

Soft Limit

- Ineffective policies, lack of coordination, and inadequate governance structures can hinder adaptation efforts.
- Social norms, values, and cultural heritage may constrain adaptation. For instance, communities may resist relocating from ancestral lands despite increasing risks.
- Adaptation may become economically unviable if the costs of action exceed the resources available or the value of what is being protected.
- While technology can support adaptation (e.g., early warning systems, drought-resistant crops), there are limits to what technology can achieve, especially for large-scale or unforeseen climate impacts.

Limits to Adaptation Leads to Loss and Damage

Residual impact of climate change resulting from insufficient mitigation and adaptation (IPCC 2014)

Loss and Damage

Global level

Mitigation

Reduction of GHG emissions

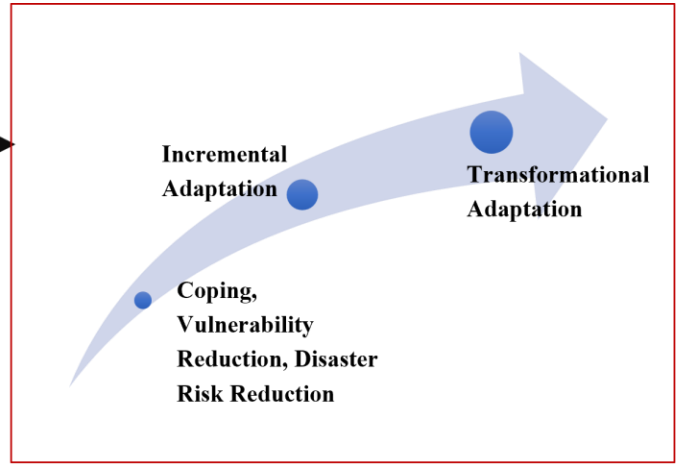
- **Insufficient Cooperation**
- **Past Emissions**
- **Economic factors**

Failure of Mitigation

Local level

Adaptation

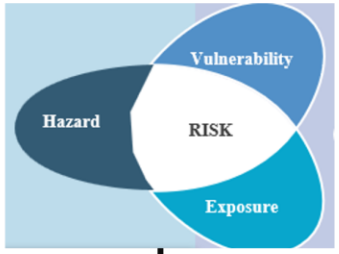
The process of adjustment to actual or expected climate and its effect



Limits to Adaptation

Soft and Hard Limits

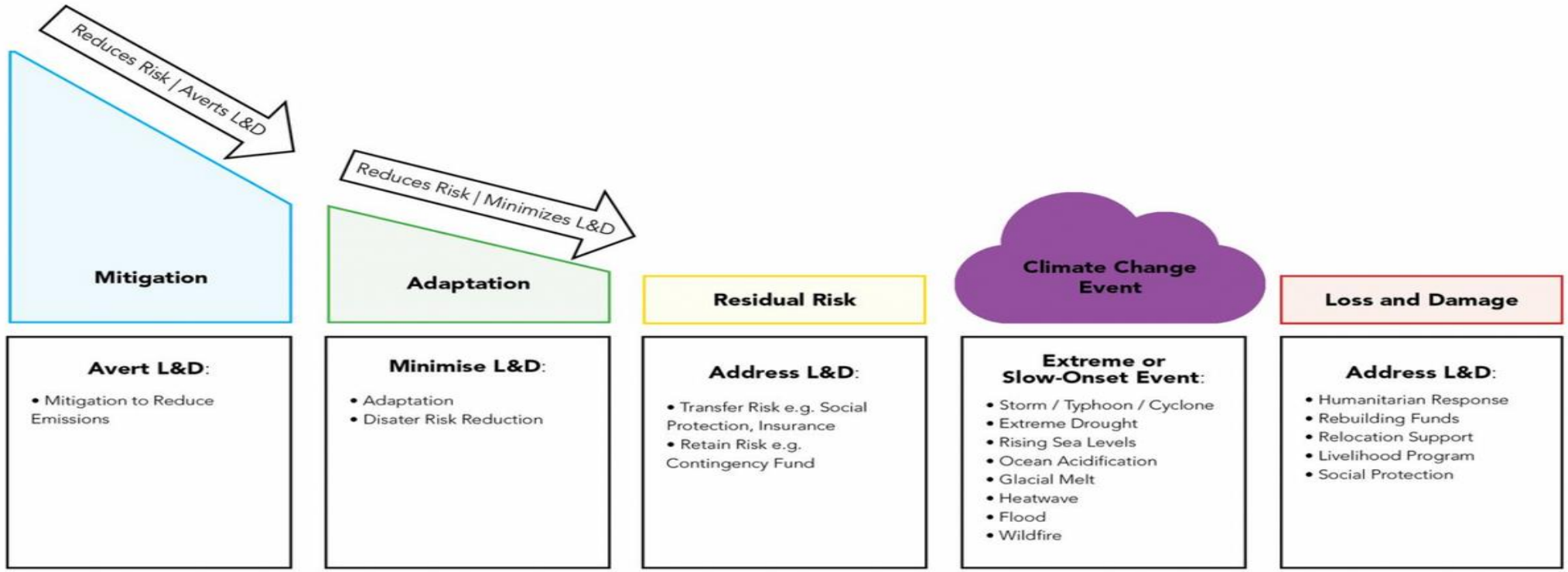
Climate Risk



- **Acceptable Risk**
- **Tolerable Risk**
- **Intolerable Risk**

Managing and reducing losses and damages must be informed by a good understanding of the risks

How does Loss and Damage intersect with Disaster Risk Reduction (DRR)?



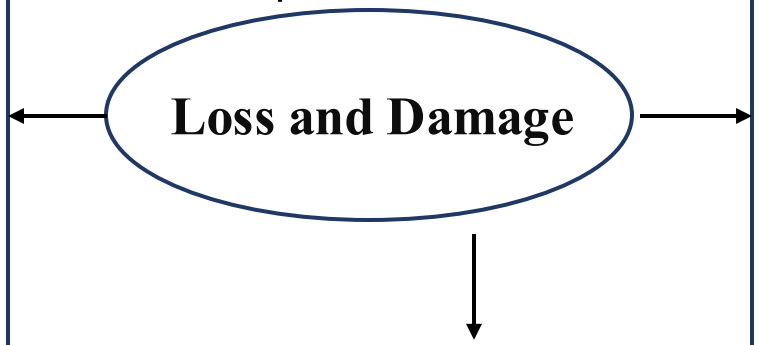
Loss and Damage

Economic L&D
- Easy to measure and quantify
- Can be traded in the market, expressed in monetary terms

E.g. Livestock, infrastructure

Non-economic L&D
- Difficult to measure or quantify
- Cannot be expressed in monetary
- terms

E.g. Culture, mental health



Avoided L&D can or will be avoided by mitigation and adaptation

Unavoided L&D cannot be avoided due to insufficient mitigation and soft limit to adaptation.

Unavoidable L&D cannot be avoided by either mitigation or hard limits to adaptation.

Challenges
- Uncertainty of the impacts of climate change
- Bifurcating the climatic or non-climatic factors of L&D
- Assessing non-economic L&D
- Minimal academic scholarship around L&D, leading to knowledge gaps to assess L&D

TIMELINE OF CLIMATE CHANGE CONFERENCES

1992
Earth summit in Rio UNFCCC opened for signature along with Rio Conventions, UNCBD, UNCCD

1995
COP 1 Berlin
First Conference of the Parties (COP) took place

1997
Kyoto Protocol (KP)
Aims to reduce the emission of Greenhouse gases

2001
Marrakesh Accords
Rules for implementing KP, setting up funding instruments & tech transfer

2005
MOP 1, Montreal
Kyoto Protocol entered into force & the 1st meeting took place

2007
COP 13, Bali Roadmap
For implementing the Convention through long term cooperative action beyond 2012

2012
CMP 8, Doha
Extended the Kyoto Protocol till 2020 & set legally binding targets

2013
COP 19, Warsaw
Adopted Green Climate Fund, Warsaw Framework for REDD+, International Mechanism for Loss & Damage

2015
COP 21, Paris
Aims to limit global warming to below 2°C preferably to 1.5°C pre-industrial level

2021
COP 26, Glasgow
Rulebook for implementing the Paris Agreement to be finalised

2022
COP 27, Sharm el-Sheikh, Egypt
Agreed to establish a Loss and Damage Fund

2023
COP 28, Dubai, UAE
Strikes historic deal to "transition away from fossil fuels"

COP 1
BERLIN, GERMANY

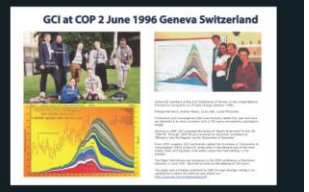
TUE, 28 MAR, 1995 – FRI, 7 APR, 1995

ADOPTION OF THE "BERLIN MANDATE," WHICH RECOGNIZED THE NEED FOR DEVELOPED COUNTRIES TO COMMIT TO STRONGER EMISSION REDUCTION TARGETS.

BUT THEY DID NOT PLANT A TREE

COP 2
GENEVA, SWITZERLAND

8 JUL 1996 – 19 JUL 1996



ACKNOWLEDGMENT OF THE FINDINGS OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), AFFIRMING THE SCIENTIFIC BASIS FOR CLIMATE ACTION.

BUT THEY DID NOT PLANT A TREE

COP 3
KYOTO, JAPAN

1–11 DECEMBER 1997

ADOPTION OF THE KYOTO PROTOCOL, A LANDMARK TREATY COMMITTING INDUSTRIALIZED COUNTRIES TO SPECIFIC EMISSION REDUCTION TARGETS.

BUT THEY DID NOT PLANT A TREE

COP 4
BUENOS AIRES, ARGENTINA

2-13 NOVEMBER 1998

CREATION OF THE "BUENOS AIRES PLAN OF ACTION" TO ADDRESS UNRESOLVED ISSUES FROM THE KYOTO PROTOCOL.

BUT THEY DID NOT PLANT A TREE

COP 5
BONN, GERMANY

25 OCTOBER TO 5 NOVEMBER 1999

FOCUS ON TECHNICAL AND METHODOLOGICAL ISSUES RELATED TO THE KYOTO PROTOCOL.

BUT THEY DID NOT PLANT A TREE

COP 6
THE HAGUE, NETHERLANDS

MON, 13 NOV, 2000 – FRI, 24 NOV, 2000

STALEMATE IN NEGOTIATIONS OVER IMPLEMENTATION RULES FOR THE KYOTO PROTOCOL, LEADING TO A FOLLOW-UP SESSION IN BONN.
AGREEMENT ON THE "BONN AGREEMENTS," RESOLVING ISSUES FROM THE HAGUE AND PAVING THE WAY FOR THE KYOTO PROTOCOL'S IMPLEMENTATION.

BUT THEY DID NOT PLANT A TREE

COP 7
MARRAKECH, MOROCCO

29 OCTOBER TO 10 NOVEMBER 2001

ADOPTION OF THE "MARRAKECH ACCORDS," DETAILING RULES FOR THE IMPLEMENTATION OF THE KYOTO PROTOCOL.

BUT THEY DID NOT PLANT A TREE

COP 8
NEW DELHI, INDIA

23 OCTOBER – 1 NOVEMBER 2002

FOCUS ON ADAPTATION MEASURES AND THE ROLE OF DEVELOPING COUNTRIES IN CLIMATE ACTION.

BUT THEY DID NOT PLANT A TREE

COP 9
MILAN, ITALY

MON, 1 DEC, 2003 – FRI, 12 DEC, 2003

FINALIZATION OF OPERATIONAL RULES FOR THE KYOTO PROTOCOL'S CLEAN DEVELOPMENT MECHANISM (CDM).

BUT THEY DID NOT PLANT A TREE

COP 10
BUENOS AIRES, ARGENTINA

MON, 6 DEC, 2004 – FRI, 17 DEC, 2004

EMPHASIS ON ADAPTATION AND FINANCIAL MECHANISMS TO SUPPORT DEVELOPING COUNTRIES.

BUT THEY DID NOT PLANT A TREE

COP 11
MONTREAL, CANADA

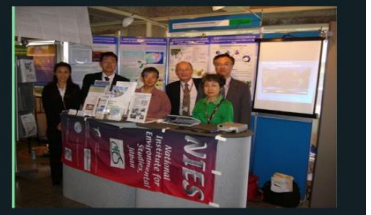
NOVEMBER 28 TO DECEMBER 9, 2005

FIRST MEETING OF THE PARTIES (MOP) TO THE KYOTO PROTOCOL AND DISCUSSIONS ON FUTURE CLIMATE ACTION POST-2012.

BUT THEY DID NOT PLANT A TREE

COP 12
NAIROBI, KENYA

6-17 NOVEMBER 2006



FOCUS ON ADAPTATION FUNDS AND SUPPORT FOR AFRICA IN TACKLING CLIMATE CHANGE.

COP 13
BALI, INDONESIA

MON, 3 DEC, 2007 – SAT, 15 DEC, 2007

ADOPTION OF THE "BALI ROADMAP," INITIATING NEGOTIATIONS FOR A SUCCESSOR AGREEMENT TO THE KYOTO PROTOCOL.

COP 14
POZNAŃ, POLAND

1 TO 12 DECEMBER 2008

PROGRESS ON THE ADAPTATION FUND AND SETTING THE STAGE FOR THE COPENHAGEN SUMMIT.

COP 15
COPENHAGEN, DENMARK

DECEMBER 7–18, 2009

THE "COPENHAGEN ACCORD," A POLITICAL AGREEMENT RECOGNIZING THE NEED TO LIMIT GLOBAL WARMING TO 2°C, BUT WITH NO BINDING COMMITMENTS.

COP 16
CANCÚN, MEXICO

29 NOVEMBER TO 10 DECEMBER 2010

THE "CANCÚN AGREEMENTS," INCLUDING THE ESTABLISHMENT OF THE GREEN CLIMATE FUND (GCF) TO SUPPORT DEVELOPING COUNTRIES.

COP 17
DURBAN, SOUTH AFRICA

28 NOVEMBER TO 9 DECEMBER 2011

LAUNCH OF THE DURBAN PLATFORM, A PROCESS TO DEVELOP A NEW GLOBAL CLIMATE AGREEMENT BY 2015.

COP 18
DOHA, QATAR

NOVEMBER 26 TO DECEMBER 8, 2012

EXTENSION OF THE KYOTO PROTOCOL UNTIL 2020 AND ADOPTION OF THE "DOHA AMENDMENT

COP 19
WARSAW, POLAND

11 TO 22 NOVEMBER 2013

ESTABLISHMENT OF THE "WARSAW INTERNATIONAL MECHANISM FOR LOSS AND DAMAGE" TO ADDRESS CLIMATE-RELATED LOSSES IN VULNERABLE COUNTRIES.

COP 20
LIMA, PERU

1 TO 12 DECEMBER 2014

ADOPTION OF THE "LIMA CALL FOR CLIMATE ACTION," LAYING GROUNDWORK FOR THE PARIS AGREEMENT.

COP 21
PARIS, FRANCE

30 NOVEMBER TO 12 DECEMBER 2015

ADOPTION OF THE PARIS AGREEMENT, A HISTORIC ACCORD AIMING TO LIMIT GLOBAL WARMING TO WELL BELOW 2°C, WITH EFFORTS TO LIMIT IT TO 1.5°C.

COP 22
MARRAKECH, MOROCCO

MON, 7 NOV, 2016 – FRI, 18 NOV, 2016

FOCUS ON IMPLEMENTATION AND ACTION PLANS FOR THE PARIS AGREEMENT.

COP 23
BONN, GERMANY (HOSTED BY FIJI)

NOVEMBER 6–17, 2017

PROGRESS ON THE "TALANOA DIALOGUE" TO ASSESS GLOBAL EFFORTS IN MEETING THE PARIS AGREEMENT GOALS.

COP 24
KATOWICE, POLAND

SUN, 2 DEC, 2018 – FRI, 14 DEC, 2018

ADOPTION OF THE "KATOWICE RULEBOOK," OUTLINING THE IMPLEMENTATION GUIDELINES FOR THE PARIS AGREEMENT.

COP 25
MADRID, SPAIN (HOSTED BY CHILE)

2 – 13 DECEMBER 2019

LIMITED PROGRESS, WITH FOCUS ON CARBON MARKETS (ARTICLE 6 OF THE PARIS AGREEMENT) AND THE NEED FOR INCREASED AMBITION.

COP 26
GLASGOW, UK

OCTOBER 31 TO NOVEMBER 13, 2021

FINALIZATION OF THE PARIS RULEBOOK, COMMITMENTS TO PHASE DOWN COAL, REDUCE METHANE EMISSIONS, AND ENHANCE CLIMATE FINANCE.

COP 27
SHARM EL-SHEIKH, EGYPT

NOVEMBER 6–20, 2022

FOCUSED ON IMPLEMENTATION AND FINANCING OF CLIMATE ACTION, WITH A FOCUS ON ADAPTATION AND LOSS AND DAMAGE.

COP 28
DUBAI, UAE

NOVEMBER 30 TO DECEMBER 13, 2023

THIS COP IS EXPECTED TO FOCUS ON ACCELERATING THE ENERGY TRANSITION AND ADDRESSING CLIMATE FINANCE.

COP 29
BAKU, AZERBAIJAN

MON, 11 NOV, 2024 – FRI, 22 NOV, 2024

THIS COP WILL LIKELY FOCUS ON FINANCE AND UPDATING NATIONAL CLIMATE ACTION PLANS.

COP30 BELÉM PARÁ AMAZÔNIA BRASIL 2025

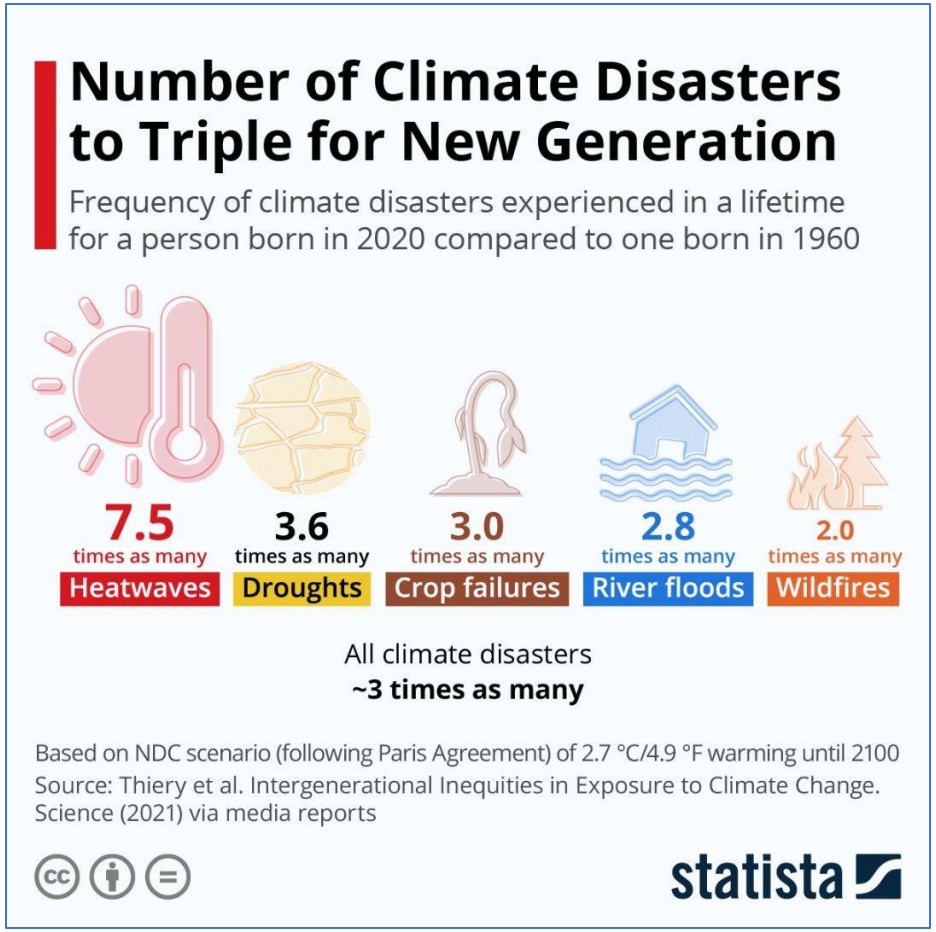
How can we differentiate Adaptation from Loss and Damage?

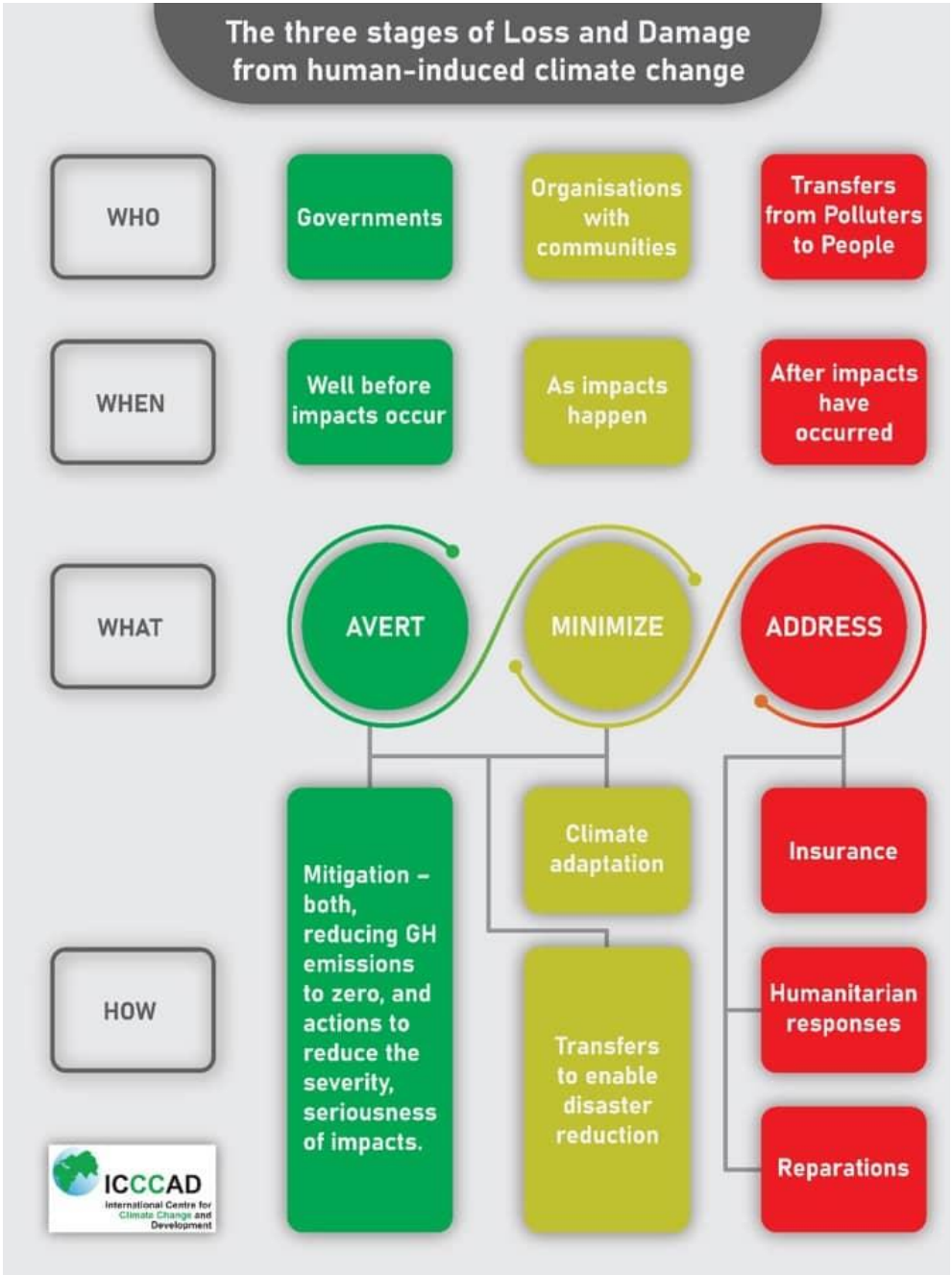
IPCC WG II Findings

- "Adaptation does not prevent all losses and damages, even with effective adaptation and before reaching soft and hard limits. With increasing global warming, losses and damages increase and become increasingly difficult to avoid, while strongly concentrated among the poorest vulnerable populations.

- "Soft limits to some human adaptation have been reached, but can be overcome by addressing a range of constraints, primarily financial, governance, institutional and policy constraint. Hard limits to adaptation have been reached in some ecosystems.

- "Losses and damages are unequally distributed across systems, regions and sectors and are not comprehensively addressed by current financial, governance and institutional arrangements, particularly in vulnerable developing countries.




The three stages of Loss and Damage from human-induced climate change
WHO
Governments
Organisations with communities
Transfers from Polluters to People
WHEN
Well before impacts occur
As impacts happen
After impacts have occurred
WHAT
AVERT
MINIMIZE
ADDRESS
HOW
Mitigation – both, reducing GH emissions to zero, and actions to reduce the severity, seriousness of impacts.
Climate adaptation
Transfers to enable disaster reduction
Insurance
Humanitarian responses
Reparations
ICCCAD
International Centre for Climate Change and Development


Under UNFCCC
(ideas for a dedicated L&D fund)
Potential suite of innovative funding sources & mechanisms
Funds from governments
International Air Passenger Levy
Windfall taxes on fossil fuel companies
Bunker Fuel Levy
Carbon pricing
POTENTIALLY MANAGED BY
GREEN CLIMATE FUND
ADAPTATION FUND
or
A new arrangement for a dedicated Loss & Damage Fund
Funds should attempt to enable easy and fast finance for risk management, rehabilitation, recovery and reconstruction
FUND ALLOCATION FOR
• Post-disaster transition
• Social protection systems & cash transfers
• Risk insurance
• Early warning systems
• Climate displaced people
• Emergency preparedness
• Enhancing microcredits for livelihood restoration
• Rehabilitation & rebuilding
Other solutions
Build on and work with existing mechanisms and initiatives
eg. Early Warnings for All
Pull in cash from existing international funds
Wider reform in international financial architecture
eg. debt relief and debt
Funds from private sector actors

Way Forward

- Fissures within the Global North – more countries are positive about L&D & supporting it
- New and additional funding to support in managing climate risks and addressing L&D – innovative sources
- Implementation of key justice criteria for L&D finance. Such as: Polluter Pays Principle (PPP), Common But Differentiated Responsibilities and Respective Capabilities (CBDR), adequacy, predictability
- Coverage for all relevant climate L&D issues– Econ. Non-Econ.
- Band wagoning with State Responsibility, Climate Security & Human Rights regimes
- Maintaining this rock-solid unity within the South.
- Ensuring democratic governance & expedited accessibility to L&D window of the World Bank.