ADDRESSING NON-ECONOMIC LOSS AND DAMAGES (NELDS) ASSOCIATED WITH CLIMATE CHANGE WITH A SPECIAL FOCUS ON EXTREME EVENTS

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OUTLINE

- Introduction
- What are NELDs
- Why NELDs are important for adaptation?
- What L&Ds are being measured and what is not?
- MCA methodology for assessing L&Ds
- Measures to overcome these limitations
- Two cases of Bangladesh and Japan
- Conclusions

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Disambiguation: Loss and Damage (UNFCCC) or losses and damages (IPCC)?

- UNFCCC: 'address loss and damage associated with impacts of climate change, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change'
- IPCC: refer broadly to harm from (observed) impacts and (projected) risks.
  - IPCC hopes this work to inform the discourse under UNFCCC.
- Differentiation and value addition aspects concerning the L&D:
  - Disaggregation of losses and damages
  - Avoidable and unavoidable L&Ds
  - L&Ds after adaptation (residual risks)

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WHAT ARE NON-ECONOMIC L&Ds (NELDs)

Economic L&Ds:

- "The loss of resources, goods and services that are commonly traded in markets" (UNFCCC, 2013).
- Economic damages can be "objectively verifiable monetary losses" (Fischer, J. M., 2010)

Non-economic L&Ds:

- The loss of "those that are not commonly traded in markets" (UNFCCC, 2013).
- Non-economic damages can be "subjective and non-verifiable losses" (Fischer, J. M., 2010)
- **L&Ds on human functions, and L&Ds of social, cultural and environmental assets which are often not valued by the existing markets**

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WHAT ARE NON-ECONOMIC L&DS

Economic vs. Non-economic L&Ds

Climate-related disasters	Example of Economic L&Ds	Examples of Non-economic L&Ds
Extreme weather/climatic events: *e.g. Typhoons, Storms, Floods, Cyclones, etc.*	•Damages to buildings •Loss of wages •Loss of crops •Reduction in tourism revenue	•Loss of life: lives killed •Human health deterioration •Forced displacement •Destruction of cultural heritages (e.g. historic building)
Slow onset events: *e.g. Sea level rise, Salinization, Drought, etc.*	•Loss of wages •Loss of crops •Reduction in tourism revenue •Damages to physical assets	•Human health deterioration •Forced displacement •Uninhabitable territory •Damages to cultural heritages •Loss of indigenous knowledge •Loss of biodiversity and ecosystem (e.g. extinction of frog species, destruction of coral reefs, etc.)

(Source: authors; based on UNFCCC, 2013)

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WHY NON-ECONOMIC L&DS ARE IMPORTANT FOR CLIMATE CHANGE ADAPTATION?

- Non-economic L&Ds can be more significant than economic L&Ds:
  - Non-economic L&Ds can constitute as much as 50% of total L&Ds.
  - Aspects covered by NELDs provide a strong basis for resilience, long-term and effective recovery, and wellbeing.
- Non-economic L&Ds are currently less understood, and there are not sufficient assessment frameworks for addressing non-economic L&Ds.
- Can lead to **underestimation** of actual total loss and damages.
- Can lead to identification of **inappropriate solutions**: Non-economic L&Ds have not been well considered in climatic & non-climatic risk assessments and in designing insurance and compensation mechanisms (Hoffmaister & Stabinsky, 2012). Non-economic L&Ds has not been sufficiently reported in the most post-disaster reports and databases (Swiss Re, 2013).
- This leads to **insufficient** recovery, limited progress in DRR and CCA, and limited information (e.g., disaster database & reports) for decision-making by practitioners and policymakers on DRR and CCA.

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WHAT IS ACTUALLY NEEDED TO BE MEASURED?

Non-economic impacts	Bangladesh	Japan
	Cyclones	Typhoons
Human functions	· Death · Injury · Infectious diseases · Skin diseases · Waterborne diseases · Malnutrition · PTSD	· Death · Injury · Infectious diseases · PTSD
Sociocultural aspects	· Displacement · Suicide · Crime · Adverse pregnancy outcome	· Displacement · Damages to cultural heritages · Conflicts, disputes · Disagreement in cultural festivals · Loss of school days
Environmental assets	• Damage to coastal ecosystems	· Impacts to biodiversity and ecosystem

(Source: authors)

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WHAT IS ACTUALLY MEASURED?

Number of economic and non-economic L&D indicators reported at various international and national disaster reporting databases

Database	Number of indicators reported	
	Economic	Non-economic
EM-DAT	1	5
Japan (Database covering natural disasters during 2003-2011)	10	5
Bangladesh (database covering floods, cyclones and landslides)	8	3

(Source: authors)

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WHAT PERTINENT QUESTIONS ARE TO BE ADDRESSED?

Important observations:

- There is more emphasis on economic L&Ds in data from countries.
- There are more number of non-economic L&Ds that are never been reported;
  - **Physical/mental diseases, people displaced, damages to social and cultural capitals, damages to biodiversity/ecosystem,** and others.

Pertinent Questions:

- Do decision-makers have sufficient information on the following?
  - How do we identify, prioritize and measure non-economic L&Ds?
  - What aspects of non-economic L&Ds need to be recorded and reported?

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LOSS AND DAMAGE ASSESSMENT METHODOLOGIES: DRR, PRE-DISASTER

Quantitative or Qualitative	Examples of Approaches	Overview	Hazard type
Quantitative	Comprehensive approach for probabilistic risk assessment	Probabilistic risk assessment based on GIS platform	Earthquakes; Tsunamis; Hurricanes; Floods; Landslides; Volcanoes
	Catastrophe simulation model of the IIASA	Monte Carlo simulation of disaster risks which examines fiscal and economic risk	Floods; Hurricanes; Weather and climate-related hazards; Earthquakes
Qualitative	Community based disaster risk management (CBDRM)	Application of measures in risk analysis, disaster prevention and mitigation and disaster preparedness by local actors	Droughts; Heatwaves; Floods; Hurricanes; Earthquakes; Volcanoes
	Vulnerability and capacity assessment (VCA)	Basic process used to identify the strengths and weaknesses of households, communities, and institutions to support decisions made in the development of mitigation programmes.	Droughts; Floods; Earthquakes

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METHODOLOGIES: DRR, POST-DISASTER

Quantitative or Qualitative	Examples of Approaches	Overview	Hazard type
Quantitative	Economic Commission for Latin America and the Caribbean	Handbook that describes the methods required to assess the social, economic and environmental effects of disasters.	Floods; Hurricanes; Weather and climate-related hazards; Earthquakes
	Emergency Management Australia (EMA)	Guidelines that explain the process of loss assessment, through the steps required to carry out an economic assessment of disaster losses.	Floods; Hurricanes; Weather and climate-related hazards; Earthquakes
Qualitative	CBDRM	Same as above	Same as above
	VCA	Same as above	Same as above

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METHODOLOGIES: CCA

Quantitative or Qualitative	Examples of Approaches	Overview	Hazard type
Quantitative	Integrated impact assessment models	Model for the dynamics of carbon accumulation in the atmosphere and their influence on the economy	No specific hazard focus
	Country environmental analysis (CEA), Strategic environmental assessment (SEA)	Analytical tools on the prioritization of environmental issues in terms of their effect on economic development and poverty	Droughts; Land degradation; Floods; Hurricanes
Qualitative	UKCCRA	Same as above	Same as above

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LIMITATIONS

- Methods:
  - Most assessment methods are focused on economic L&D, complex in nature and hence not accessible to the stakeholders who actually measure L&Ds
  - Most of them take '*steep learning*' curve as actors engaged in DRR (and to an extent in CCA) are not well-versed with the non-economic valuations of L&Ds
- Systems:
  - Institutional systems are not well developed to adopt and value NELD in decision making
  - While social systems tend to value NELDs much higher than one would think
- Information:
  - Providing decision-relevant information can be a challenge as the information generated was detached from the users perspectives.

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PRIORITIZING ADAPTATION INTERVENTIONS USING MCA METHODOLOGIES

- Stakeholders engaged in L&D have multiple criteria/priorities/objectives.
- Multi-criteria methodologies:
  - MCA methodologies aid in selecting the 'best' alternative from the number of feasible choice-alternatives under the presence of many criteria and diverse criterion priorities
  - Examples:
    - Cost-benefit analysis (focus on dollar value)
    - Cost-effectiveness analysis (focus on cost per outcome)
    - Analytic hierarchy process (AHP) (qualitative)

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ANALYTIC HIERARCHY PROCESS (AHP)

- AHP helps in structuring of a multi-dimensional problem into a hierarchical tree with criteria and alternatives.
- Developed by Prof Thomas Saaty in 1990.
- Most reliable MCA method.
- Easy to interpret.
- Efficient for project and policy evaluation.
- Intuitive and flexible over other methods.
- Helps evaluates measures and alternatives.

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AHP ADVANTAGES

- Helps capturing both subjective and objective evaluation measures and alternatives.
- Pair-wise comparison is easy to understand.
- **Group decision** is supported through consensus by calculating geometric mean of the individual pair-wise comparisons.
- Reduces bias in decision-making.
- Offers effective means in situations of uncertainty and risk through derivation of scale where measures do not exist.

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AHP WORKSHOPS IN BANGLADESH, JAPAN, THAILAND, INDIA AND PHILIPPINES

- Step I • Set the goal
- Step II • Identify criteria that helps evaluate the goal
- Step III • Identify and prioritize indicators that help assess the criteria
- Step IV • Identify and prioritize practices that are to be evaluated
- Step V • Pair-wise comparisons using **Super Decisions** software

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BANGLADESH WORKSHOP

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JAPAN WORKSHOP

INDICATORS FOR ASSESSING NELD

(10 areas, 31 indicators)

Area of NE L&Ds	Overview	Indicators
Human life	Loss of life (death)	• No. of people killed
Human health	Health deterioration	• No. of people injured • No. of people suffered infectious diseases • No. of people suffered chronic diseases • No. of people suffered mental diseases • No. of people suffered malnutrition
Education	Loss of educational opportunity	• Bullying • No of schools discontinued • No of children dropped out school • No of children temporary discontinued school
Human mobility	Displacement	• No. of people displaced
Territory	Loss of place attachment	• Place identity (*emotional*) • Place dependence (*functional*)

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IMPORTANT INDICATORS

Area of NE L&Ds	Overview	Indicators
Social capital	Disruption in social network	• Participation in social activities • Acceptance of community leaders • Social hostilities • Ability to build consensus • No. of cooperatives/membership in societies • No. of households migrating (seasonally) • No. of women with migrated husband
Cultural heritage	Loss of cultural attachment	• Cultural identity to cultural heritage sites • Cultural dependence on cultural heritage sites
Indigenous knowledge	Loss of indigenous knowledge	• Availability of indigenous knowledge (IK) • Availability of people with IK

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IMPORTANT INDICATORS

Area of NE L&Ds	Overview	Indicators
Local governance	Disruption in institutional network	• Collaboration • Organizational conflicts • Ability to facilitate external coordination
Biodiversity/ Ecosystem services	Biodiversity/ecosystem deterioration	• Species abundance • Species diversity • Area of forest • Water available in rivers and lakes

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IMPORTANT CRITERIA FOR IDENTIFYING NELD INDICATORS

Criteria for identifying indicators on non-economic L&Ds

1. Value given by society
2. Significant impact on the larger well-being of family/society in the long-run
3. Cost of measuring an indicator
4. Policy relevance of an indicator
5. Relevance to DRR-CCA planning
6. Measurability
7. Verifiability
8. Familiarity
9. Exclusivity

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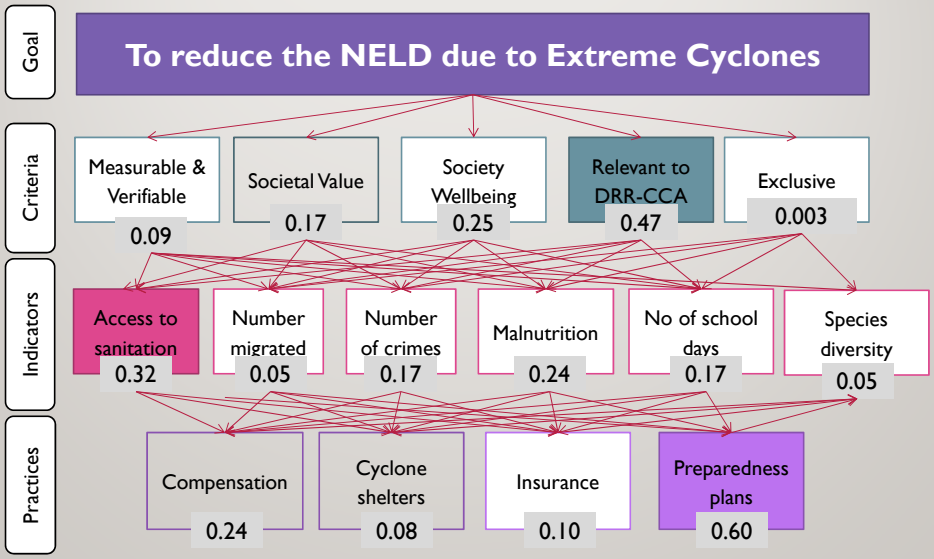
ADDRESSING NON-ECONOMIC LOSS AND DAMAGE: BANGLADESH



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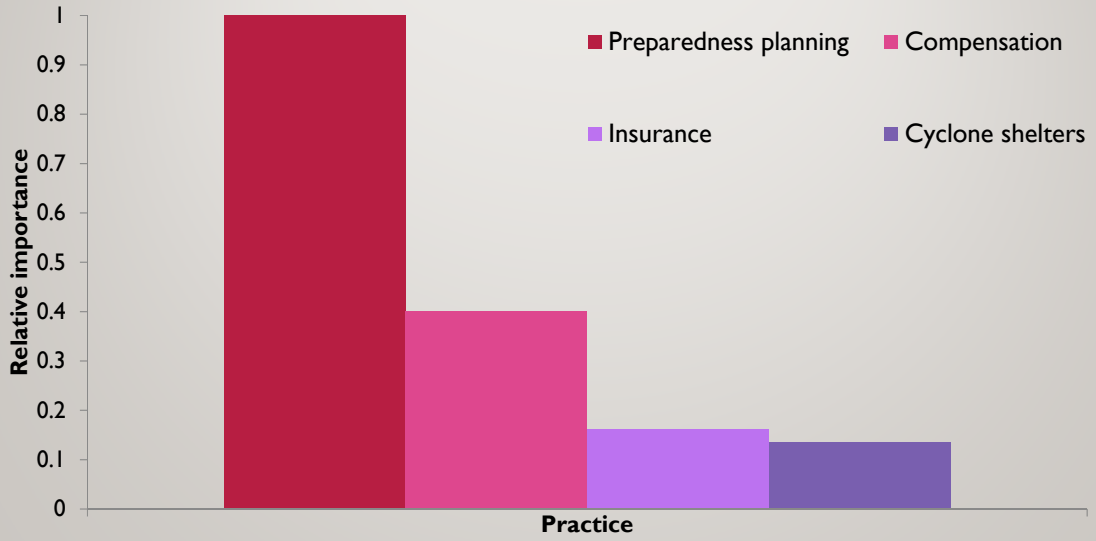
EFFICACY OF PRACTICES COMPARED



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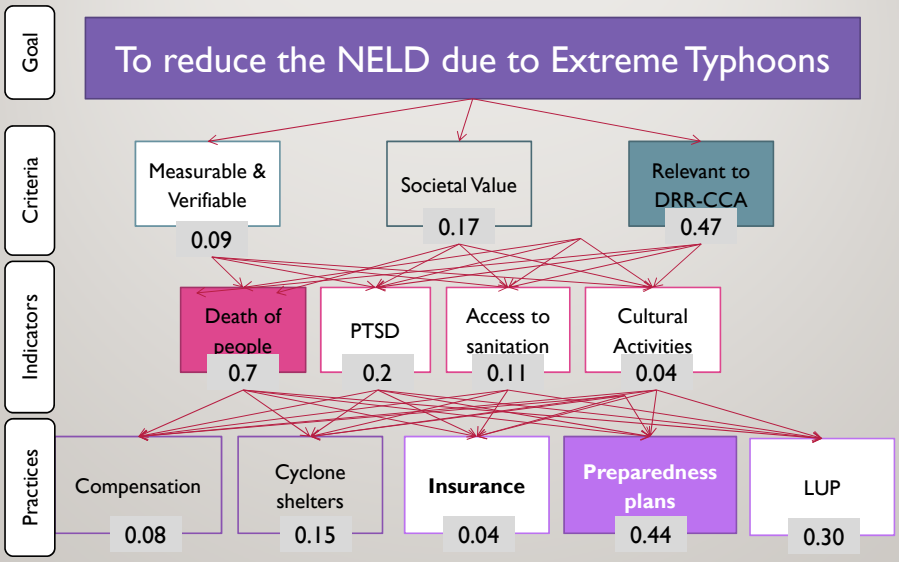
ADDRESSING NON-ECONOMIC LOSS AND DAMAGE: JAPAN



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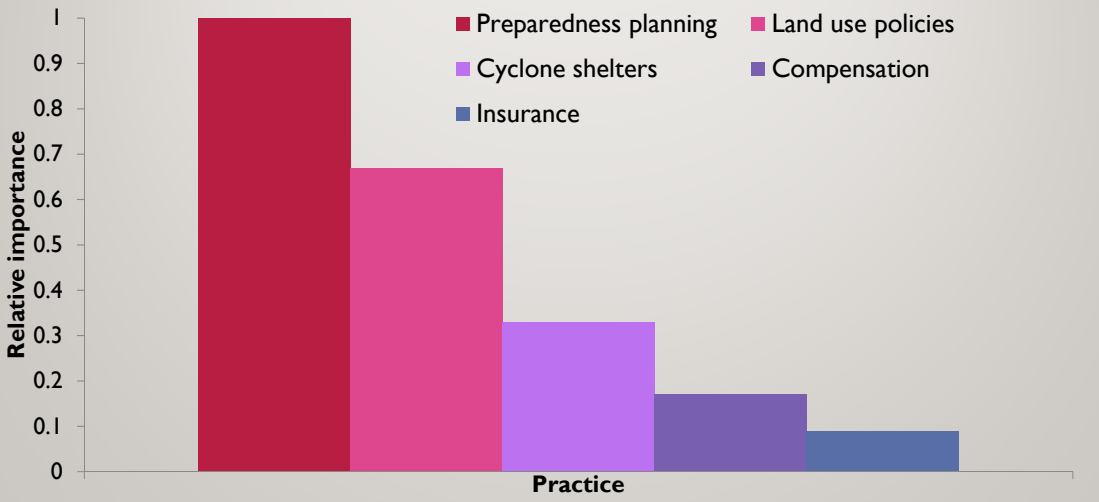
EFFICACY OF PRACTICES COMPARED: JAPAN



WHY?

Low Performance of Insurance

- Insurance is seldom consider NELDs and hence don't address NELDs
- Improved income stabilization doesn't necessarily lead to immediate improvements in non-economic aspects of life
- Traditional issues: High opportunity and operational costs, insufficient loss coverage, high price, trust issues

What about Compensation?

- No opportunity cost (no need to pay to get it)
- Mostly certain that some form of compensation will arrive soon

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RECOMMENDATIONS

- Handholding exercises with governments in measuring NELD and incorporating that information into CCA and DRR decision making
  - Provide compelling evidence for importance of NELD by comparing NELD with ELD on comparable terms (tough task)
  - Incorporating NELD indicators into local data collection formats of governments
  - Assess CCA and DRR initiatives based on NELD efficacy and update priorities assigned to them
  - Quantification problem Focus on impacts for which methodologies exist (e.g. ecosystem services)

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THANK YOU!

To APN and SLYCAN Trust for this initiative.
To participants for listening.

Access our work here