Challenges in Assessing Non-Economic Loss and Damages of Climatic Disasters

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What are non-economic L&Ds (1)

Economic losses:

- can be understood as the loss of resources, goods and services that are commonly traded in markets (UNFCCC, 2013).

Non-economic losses:

- can be understood as the remainder of items that are not economic items; that is to say that non-economic items are those that are **NOT commonly traded in markets** (UNFCCC, 2013).
- can be understood as losses of, inter alia, life, health, displacement and human mobility, territory, cultural heritage, indigenous/local knowledge, biodiversity and ecosystem services.
- occur in three distinct areas: *1) Individuals , 2) Society and 3) Environment.*

What are non-economic L&Ds (2)

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

(Source: authors; based on UNFCCC, 2013)

Why addressing non-economic L&Ds is important?

Non-economic L&Ds can constitute as much as 50% or more of the reported L&Ds.

The L&Ds associated with climate change, including extreme climatic events and slow onset events, are likely to increase, especially with non-economic factors and the inter-linkages of phenomena leading to cascading, transnational effects (UNFCCC, 2012).

In many developing countries, non-economic L&Ds may well be more significant than economic L&Ds, and recognizing and managing the risk of non-economic L&Ds should therefore be a central aspect of climate change policy (UNFCCC, 2013).

In general, non-economic L&Ds have not been often taken into consideration in most risk assessments of both climatic and non-climatic in nature and in designing insurance and compensation mechanisms (UNISDR, 2010; Hoffmaister and Stabinsky, 2012), and the non-economic L&Ds have not been sufficiently reported in the most post-disaster reports and databases (Swiss Re, 2012). [Slides to follow]

How non-economic L&Ds have been considered (1)

In Disaster Database:

Example 1: The International Disaster Database (EM-DAT)

Main Database Category	Economic L&D	Non-economic L&D
Disaster number	-	-
Country	-	-
Disaster group	-	-
Disaster type	-	-
Date	-	-
# of Persons killed		○
# of Persons injured [a]		○
# of Persons homeless [b]		○
# of Persons affected [c]		○
# of Persons totally affected [a+b+c]		○
Estimated Damage (000') US$	○	

How non-economic L&Ds have been considered (2)

In Disaster Database:

Example 2: Database on Damages of Natural Disasters in Japan on 2003-2011

Main Database Category	Economic L&D	Non-economic L&D
# of Households affected		○
# of Persons affected		○
Damage amount [million yen]	○	
# of Persons killed		○
# of Persons missing		○
# of Persons injured	○	○
# of Dwelling houses ruined, half-ruined, partly-ruined, flooded above/below the floor	○	
# of Non-residential buildings damaged [public buildings, other]	○	
Area [ha] of Paddy fields swept away/buried, water-covered	○	
Area [ha] of Fields swept away/buried, water-covered	○	
# of Damaged schools, bridges, rivers	○	
# of Landslide,	-	-
# of railway blockage, damaged ships [vessels]	○	

How non-economic L&Ds have been considered (3)

In Disaster Database:

Example 3: Disaster Database on Floods, Cyclones and Landslides in Bangladesh

Main Database Category	Economic L&D	Non-economic L&D
District, Upazila, Family, People	-	-
Crops fully damaged	○	
# of House fully damaged	○	
# of Dead people		○
# of Institution fully damaged	○	
# of Institution partially damaged	○	
Road fully damaged (km)	○	
Road partially damaged (km)	○	
# of bridge/culvert damaged	○	
Embankment damages	○	
Remark	-	-

How non-economic L&Ds have been considered (4)

In DRR Planning:

Example : National DRR Plan

Country	Source	What NE L&Ds are considered?	Examples of the measures to address NE L&Ds
Japan	Basic Disaster Management Plan [Jan., 2014]	• Loss of life • Loss of property • Physical/psychological human impacts • Human mobility	• Support of affected people: securing residence (evacuation center, temporary housing, collective relocation), medical care, mental healthcare, etc. • Support of rescue team, firefighters: addressing Critical Incident Stress (CIS)
India	National Policy on Disaster Management [2009]	• Loss of life • Loss of property • Physical/psychological human impacts • Human mobility • Loss of biodiversity, ecosystem	• Support of affected people: medical response, psychosocial support and trauma counselling, (animal care,) temporary/intermediate shelters, etc. • Restoration of ecosystem in Himalayan region
Philippines	The National Disaster Risk Reduction and Management Plan 2011 to 2028 [Dec., 2011]	• Loss of life • Loss of property • Physical/psychological human impacts • Displacement • Loss of indigenous/local knowledge • Loss of biodiversity, ecosystem	• Support of affected people: securing residence (evacuation centers, temporary shelters, relocation sites), medical care, Mental Health and Psychosocial Services (MPHSS), etc. • Indigenous practices and local knowledge • Ecosystem and environmental stability

Important Observations

Equal or more emphasis on non-economic L&Ds, in terms of indicators covered by international disaster databases.

There is more emphasis on economic L&Ds in data from countries, such as Japan and Bangladesh.

The indicator 'economic damage' may not be always clearly defined.

Even some non-economic L&Ds (e.g. people killed) could have economic value, which needs proper consideration in disaster reporting.

There are more number of non-economic L&Ds that are never been reported (listed in slide No. 3):

- Damage to ecosystem services
- Post-traumatic stress disorder (PTSD) and others

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What is Reported and Not Reported?

Non-economic L&D	Reported or not reported
•Loss of life	•Widely reported
•Health impacts	•Sometimes reported
•Temporary evacuation	•Widely reported
•Long-term displacement	•Not reported
•Destruction of cultural heritage	•Not widely reported
•Loss of biodiversity & eco-system services	•Not reported
•Land becoming uninhabitable	•Sometimes reported
•Loss of indigenous knowledge	•Not reported

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How non-economic L&Ds have been considered (5)

Is all that currently reported sufficient for purposes on DRR-related decision-making?

How do we prioritize, what aspects of non-economic L&Ds need to be recorded and reported?

Objective of APN/IGES Project

Our ongoing APN project aims to develop simplified methodologies for prioritizing and assessing important non-economic L&Ds in national & sub-national planning.

This project will address the following questions:

- What important non-economic L&Ds have not been recorded and have reported, and how to incorporate them into regular reportage?
- Whether considering the additional non-economic L&Ds alter the design of risk reduction measures (e.g. insurance portfolio/contracts?
- Whether the non-economic L&Ds will alter the outlays to DRR response, relief, rehabilitation and mitigation?

Overview of APN/IGES Project (1)

Project Title	Addressing non-economic losses and damages associated with climate change: Learning from the recent past extreme climatic events for future planning (reference: CAF2014-RR08-NMY-Chiba)
Donor	Asia Pacific Network for Global Change Research (APN) under the Climate Adaptation Framework (CAF) of funding
Project Duration	2014-2015 (effective duration 2.5 years with no-cost extension of 6 months)
Project Team	•Yohei Chiba (Mr.), IGES, Japan •SVRK Prabhakar (Dr.), IGES, Japan •Ainun Nishat (Dr., Prof.), BRAC University, Dhaka, Bangladesh •Rosalina G. de Guzman (Dr.), PAGASA, Quezon City, Philippines •Sangam Shrestha (Dr.), AIT, Thailand •Ajinder Walia (Dr.), NIDM, Uttar Pradesh, India

Overview of APN/IGES Project (2)

Components:

1) Develop an assessment framework to identify and measure important non-economic L&Ds for key vulnerable sectors (e.g., agriculture, water, livelihood and gender);

2) Identify range of best practices for addressing the non-economic L&Ds; and

3) Develop policy mainstreaming guidelines addressing non-economic L&Ds, targeting key policy-makers and practitioners.

Overview of APN/IGES Project (3)

	Methodologies (under consideration)	Pros.	Cons.
1	Economic valuation: • CBA • Wealth/capital accounting	• Structured, systematic approach to evaluation of non-economic and economic effects	• Unreliability of and uncertainty about monetary values and other aspects economic appraisal (e.g. discounting)
2	Multi-criteria decision analysis (MCDA):	• Structured, systematic approach to evaluation of non-economic and economic elements	• Generally resource-intensive if method is employed comprehensively • Generally lacking robustness in scoring and weighting choices
3	Composite risk indices :	• Same as above	• Same as above
4	Qualitative & semi-quantitative approaches: • EIA, SEA, CCIAV	• Avoiding uncertainties inherent in explicit aggregation across effects	• Putting onus on decision makers to implicitly perform comparisons

(Source: authors; based on UNFCCC, 2013)

Can they help in identifying which non-economic L&Ds need to be prioritized for regular reporting?

Can these methodologies be used for DRR decision-making?

Overview of APN/IGES Project (4)

Outcomes:

The methodology developed for assessing the non-economic L&Ds associated with extreme events and relevant case studies will help research, development and policy community in developing CCA and DRR solutions addressing non-economic L&Ds.

References

- Hoffmaister J.P. and D. Stabinsky (2012). Loss and damage: Some key issues and considerations for SIDS expert meeting. Briefing Paper on Loss and Damage: 4. SIDS Expert Meeting, 9-11 October, Bridgetown, Barbados.
- Central Disaster Management Council, Japan (2014). Basic Disaster Management Plan.
- CRED (2009). EM-DAT The International Disaster Database. Retrieved from http://www.emdat.be/
- Department of Disaster Management, Bangladesh (2012). Past Disaster Information. Retrieved from http://www.ddm.gov.bd/pastdisaster.php
- National Disaster Management Authority (2009). National Policy on Disaster Management.
- Department of the Interior and Local Government (DILG), Philippines (2011). The National Disaster Risk Reduction and Management Plan (NDRRMP) 2011 to 2028.
- Swiss Re (2012). Natural catastrophes and man-made disasters in 2012: An year of extreme weather events in the US. Switzerland: Swiss Re.
- Statistics Bureau, Japan (2014). Japan Statistical Yearbook 2014.
- Tol, S.J. and S, Fankhauser. (1998). On the representation of impact in integrated assessment models of climate change. Environmental Modeling and Assessment, pp 63-74.
- UNFCCC (2013). Non-economic losses in the context of the work programme on loss and damage. Technical paper, pp 1-22.
- UNFCCC (2012). A literature review on the topics in the context of thematic area 2 of the work programme on loss and damage: a range of approaches to address loss and damage associated with the adverse effects of climate change. Note by the secretariat, pp 4-7.
- UNISDR (2010). Disaster risk reduction tools and methods for climate change adaptation. Inter-Agency Task Force on Climate Change and Disaster Risk Reduction. Geneva, Switzerland: UNISDR.