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## Editorial: Loss and damage from climate change: emerging perspectives

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### 1 Introduction

This paper introduces a special issue that presents multiple perspectives on climate-induced loss and damage. The special issue is a collection of papers presented at the ‘Perspectives on loss and damage: society, climate change and decision-making’ conference held at United Nations University Institute for Environment and Human Security in Bonn, 25–27 February 2013. The conference took place three months after the decision, taken at the 18th Conference of the Parties (COP/18) in Doha, to establish institutional arrangements on loss and damage.

Nearly two years ago, in October 2013, the *International Journal of Global Warming* published its first special issue on loss and damage. That issue documented evidence of losses and damages in nine local case studies in Africa, Asia and the Pacific (Warner and van der Geest, 2013). It addressed an important gap in the emerging debate on loss and damage: the lack of empirical data. The evidence accumulated in the special issue suggested that loss and damage is a result of an insufficient ability to adapt and that loss and damage is a real phenomenon with tangible consequences today. Some of the most notable losses and damages that were recorded in the case studies were on household food production and human wellbeing, with implications for poverty, livelihood security, and health – all sustainable development goals (SDGs) that are climate sensitive.

The community-based research revealed four ‘pathways to loss and damage’, or in other words, four situations in which actors in the case study sites incurred residual impacts of climate stressors, leading to deepening poverty, erosion of household living standards and health (Warner and van der Geest, 2013). The research showed that actors incur loss and damage when:

- existing coping/adaptation measures were not enough to avoid loss and damage
- measures had costs (economic, social, cultural, health, etc.) that were not regained
- despite short-term merits, measures had negative effects in the longer term
- no measures were adopted – or possible – at all.

In the past two years, the case studies in the first special issue received over a hundred citations, underscoring the demand for more empirical data and insights on the emerging topic of loss and damage.

## **2 The context**

In the climate change negotiations in Warsaw (COP/19), groups of vulnerable countries used the evidence presented in the first special issue to show that loss and damage is not just a vague future risk, but also a harsh present-day reality. This is in contrast to the IPCC Fifth Assessment Report (IPCC, 2014), which predominantly sees loss and damage as a future risk (van der Geest and Warner, 2015). Local-level evidence of current loss and damage, such as that presented in the first special issue, helped convince Parties that were hitherto sceptical or resistant, to agree with the establishment of the Warsaw International Mechanism for Loss and Damage associated with climate change impacts.

In November 2013, on the sidelines of the 19th Conference of the Parties, the World Bank launched a report with findings on economic losses from natural disasters (World Bank, 2013). The report presented findings from re-insurance company Munich-re, which estimate that nearly US\$4 trillion was lost over the past 30 years. The findings also show that annual losses increased four-fold from around US\$50 billion in the early 1980s to around US\$200 billion in 2010. Almost three-quarters of these losses were attributable to hydro-meteorological disasters. Natural disasters further claimed 2.5 million lives, 61% of which were caused by weather extremes. The science of attribution of these losses to greenhouse gas emissions and global warming is still in its infancy, but there is already evidence that global warming increases the frequency and intensity of weather-related disasters (IPCC, 2012).

Investment in preventing dangerous climate change and reducing disaster risks is key to minimising loss and damage. Economic models show that every dollar spent on prevention saves US\$3–4 in rebuilding, and for early warning systems the savings can even be up to US\$36 (Hallegatte, 2012). However, prevention is not enough to address all loss and damage. There are already losses and damages that have become unavoidable due to locked-in emissions and adaptation limits (Huq et al., 2013). This is also acknowledged in the preamble of the Warsaw International Mechanism, which states that “...loss and damage associated with the adverse effects of climate change includes, and in some cases involves more than, that which can be reduced by adaptation...” [UNFCCC, (2014), p.6].

### **3 Loss and damage and adaptation limits and constraints**

More conceptual clarity on loss and damage is needed to design adequate policies and practices to address loss and damage. Currently, there is no agreed-upon definition of loss and damage. In the past few years, since the rise of loss and damage in the climate change negotiations, there have been two main strands of framing loss and damage. The first strand suggests that loss and damage refers to current and/or potential manifestation of climate impacts that negatively affect human and natural systems. This type of definition does not clearly distinguish between impacts and loss and damage. By contrast, the second strand emphasises that loss and damage refers to adverse effects that have not been mitigated, and that are beyond adaptation. The second strand's definition is gaining prominence among scholars and practitioners. A fit-for-purpose definition could be that "loss and damage refers to adverse effects of climate-related stressors that have not been or cannot be avoided through mitigation and adaptation efforts". Loss and damage is expected to occur in all countries, but vulnerable populations in vulnerable countries will be hit particularly hard.

Current efforts to adapt to climate stressors represent important first steps, but they are not yet at the scale needed to offset negative impacts of climate change with current emissions scenarios. The higher the concentration of greenhouse gas emissions in the Earth's atmosphere, the more significant the adjustments will have to be for society, and the natural systems society depends upon for its wellbeing and survival.

In its Fifth Assessment Report, the IPCC (2014) included for the first time a chapter about 'opportunities, limits and constraints to adaptation'. Adaptation constraints are those factors that make it harder to plan and implement adaptation actions. Limits to adaptation are reached when adaptive action can no longer achieve the objectives of an actor, and intolerable risks must be faced. There are three options when a limit is reached: accept escalating losses, shift adaptation objectives, or undertake discontinuous/transformational responses to climatic stressors. There are both soft and hard limits to the adjustments that can be made in human and natural systems. Soft adaptation limits occur when no options are currently available to avoid intolerable risks through adaptive action. Hard adaptation limits occur if no adaptive actions are possible to avoid them. Limits to adaptive capacity will affect human rights and well-being across sectors: water and food security, culture and identity, sovereignty, the economy, infrastructure, etc. Adaptation limits are already being hit for considerable groups of vulnerable people who live in highly exposed and risk-prone places and who lack the capacity to adapt.

When societies approach limits to adaptation decision makers at different levels will have to make trade-offs and value judgments between risks that are acceptable, risks that are tolerable, and risks that are considered intolerable. To manage loss and damage, decision makers need support in finding solutions, especially for risks that are considered intolerable.

### **4 Emerging perspectives**

There are multiple scientific, technical and normative ways of looking at loss and damage. The different perspectives shape the way practice and policy address the many

manifestations of loss and damage. Some of the emerging perspectives are listed here, and are well-represented in the papers in this special issue:

- *Technical* perspectives aim to minimise current and future loss and damage by protecting people, properties and ecosystems against climate-related stressors through technical solutions. It can involve engineering solutions, such as constructing more resistant buildings and infrastructure, but technical perspectives can also involve ‘softer’ approaches, such as early warning systems against extreme weather, enhancing communities’ preparedness against disasters or the development of drought resistant cultivars.
- *Legal* perspectives place importance on establishing norms, and helping to adjudicate in an orderly and transparent fashion when disputes arise. Discussions about compensation for loss and damage tend to be dominated by scholars and practitioners with a legal perspective.
- A *climate science* perspective on loss and damage is concerned with the question: to what extent can extreme weather events be attributed to anthropologically enhanced global warming? Or more precisely: to what extent does global warming influence the probabilities that different types of extreme weather events with different magnitudes occur?
- *Humanitarian* perspectives focus on short-term measures that have a life-saving and crisis management focus. Timely and adequate provision of emergency relief can be of crucial importance for minimising indirect losses and damages to the things people value most, such as livelihood, health, assets, and education.
- *Development* perspectives tend to have a longer-term focus on interventions that build resilience against climate-related stressors. A development perspective on loss and damage can also look at how climate change and extremes undermine SDGs and how this can be avoided.
- *Human rights*-based approaches see loss and damage as adverse effects of climate change on the enjoyment of human rights, such as the right to life, health, food, adequate housing, education, work and self-determination. In this perspective, it is a moral obligation to avoid loss and damage to the extent possible and to find dignified solutions for losses and damages that have not been or cannot be avoided.
- *Financial and economic* perspectives focus on impacts of climate change on economic performance, cost-efficiency, and cost-benefit analyses of different measures to avoid loss and damage and the cost of dealing with losses and damage that have not been or cannot be avoided.
- *Non-economic* perspectives underscore the lack of attention for loss and damage to entities that are not commonly traded in markets, such as identity, trust, belonging, social cohesion, traditional knowledge, cultural heritage, landscapes and ecosystems. These issues are not well-expressed in monetary terms but are of vital importance to society and may be damaged or lost as climate change unfolds. A non-economic loss and damage perspective is about values, about what matters for different types of actors.

- *Ecological/environmental* perspectives highlight the interconnectivity of human and natural systems, as well as how climate change affects these interactions. Such perspective can, for example, highlight the difference between a 2 and a 4 degree warmer world in terms of implications for ecosystems and the services they provide to humans.
- *Activist* perspectives on loss and damage emphasise that adverse effects of climate change are already widespread under the current 0.8 degrees of warming, and that the harm associated with 2 or 4 degrees of warming is unacceptable, especially for vulnerable populations in vulnerable regions. Loss and damage from this perspective is a leverage for enhanced efforts to mitigate and adapt.

There is no ‘silver bullet’ approach to addressing loss and damage. Each perspective has something valid to contribute and should be considered in the architecture of emerging arrangements and policy to address loss and damage. A single-lens approach, be it technical, legal or financial, cannot adequately address the challenges across sectors and scales. As more is learned about climate-induced loss and damage, a broad strategy, encompassing different perspectives on loss and damage, can enable policy makers to find multiple solutions that fit specific situations.

## 5 The papers in this issue

The multiple perspectives on loss and damage are well-represented in this special issue, which includes contributions by a lawyer, climate change negotiators, agronomists, geographers, anthropologists, economists and more. The focus ranges from assessing loss and damage to addressing loss and damage; from local to national and global scales; and from measurable to less tangible losses. Below, key findings and insights of each paper are summarised.

Roberts and Huq (2015) chronicle the rise of loss and damage in the climate change negotiations under the United Nations Framework Convention on Climate Change (UNFCCC), with special attention to parallel developments of increasing evidence about adaptation limits and constraints in the assessment reports of the Intergovernmental Panel on Climate Change (IPCC). Drawing on a large number of UNFCCC reports and the wider literature, they show how the focus in the negotiations shifted from an almost exclusive focus on mitigation to both mitigation and adaptation and finally to the current era in which loss and damage has emerged on the agenda.

Verheyen (2015) looks at loss and damage from a legal perspective. She explains that while in theory it is possible for actors that incur loss and damage to seek compensation from ‘polluters’, in practice, some extremely difficult questions need to be answered. Some of these questions relate to climate science, and the attribution of extreme weather events to global warming, while others focus on the extent to which losses and damages can be attributed to these events, and not to other contributing factors. These are relevant questions to which climate science and other research disciplines can contribute. However, importantly, Verheyen argues in the conclusion that showing legal causation may not be necessary in the case of greenhouse gas emissions and climate change impacts. A reversal of the burden of proof might apply in this case even though this is yet undecided.

Gall (2015) explores how suitable existing disaster loss databases are for documenting losses and damages associated with impacts of climate change and extremes such as floods, droughts and cyclones. She finds that these databases have a meaningful contribution to make, but need substantial improvement in terms of availability and quality. In particular, she highlights the complexity of assessing loss and damage from slow-onset hazards, which requires monitoring over longer time frames than what is currently common practice. The paper gives nine recommendations for improving disaster loss databases.

Birkmann and Welle (2015) argue that disaster loss scholars and practitioners need to move from a retrospective, reactive and narrow understanding of measuring loss and damage to a broader understanding of the multiple facets that determine the risk of loss and damage. They use the World Risk Index to show differences in the risk of loss and damage between low- and high-income countries, within countries, and between sudden-onset and slow-onset hazards. They conclude that addressing the risk of loss and damage requires more effective adaptation.

Surminski and Eldridge (2015) focus on the role of the private sector in addressing loss and damage. They use official submissions by Parties to the UNFCCC and other qualitative data sources to elucidate what role the international community envisions for the private sector. Their main finding is that this role is still vague, but expectations are that the private sector will mainly provide expertise, knowledge, skills and resources, as is already the case for the insurance industry. The authors further find that the unclear boundaries between climate change adaptation, disaster risk reduction and loss and damage are an important barrier to effective private sector engagement.

Ahmed and Schmitz criticise models that fail to incorporate agricultural adaptations in estimations of future climate-induced crop losses in Pakistan. They use choice models to show that current and past farm adaptations in Pakistan, which consider climate and expected income, are very effective at minimising loss and damage. Technical work like this can play an important role in evaluating which adaptation strategies work and which do not. This in turn is an important avenue for reducing loss and damage in the near and more distant future.

The paper by Roberts and Andrei (2015) zooms in on two special cases in the loss and damage debate: Alaska and the small island state of Kiribati. Both are at the frontlines of climate change and are threatened in particular by slow-onset processes, such as sea level rise, permafrost melt and coastal erosion. Loss of habitability and displacement are a reality there that can no longer be avoided, even in the hypothetical case where global greenhouse gas emissions are reduced to zero overnight. The paper has several recommendations that can help minimise non-economic losses and damages, such as loss of identity, associated with resettlement and relocation.

The article by Wrathall et al. (2015) entitled 'Problematizing loss and damage', anticipates some of the challenges that they expect the Warsaw International Mechanism will encounter. In their view, the loss and damage debate, and adjacent fields of enquiry, such as adaptation limits and transformation, are inherently normative. The authors see enormous challenges in translating these normative debates to policy design and effective implementation. In particular, they are concerned that the expertise and resources channelled towards the most vulnerable populations will reproduce their vulnerabilities, rather than bring about the necessary transformations that would make them more resilient against climatic and other disturbances.

Stabinsky and Hoffmeister (2015) provide an inside look at the evolution, foundations, and rationale for the establishment of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts. They explicitly link the emergence of loss and damage in the climate negotiations to the realisation among researchers that there are limits and constraints to adaptation and that not all impacts of climate change can be avoided, particularly in vulnerable countries. The authors further highlight the importance of slow-onset processes, non-economic loss and damage, the impacts of climate change on human mobility, and the role of insurance in addressing loss and damage. They conclude the paper by explaining what role they see for the Warsaw International Mechanism in addressing loss and damage.

## 6 Conclusions

What becomes clear from the papers in this special issue is that to address loss and damage, one needs to be better able to assess loss and damage. And assessing loss and damage does not necessarily equal measuring loss and damage. It involves measuring what is measurable and understanding and qualifying what is not. Research needs to support decision-making for comprehensive risk management, signalling when limits to adaptation are being approached, what the consequences could be, and what the options are for managing loss and damage. More knowledge will not necessarily decrease uncertainty, implying that there is a simultaneous need to improve decision-making under uncertainty.

There is still scope for avoiding much avoidable loss and damage by stepping up mitigation and adaptation efforts. This can be accomplished within existing frameworks under UNFCCC. However, the international community must also find appropriate and dignified solutions for the losses and damages that have become unavoidable or that have not been avoided due to adaptation constraints. That is the challenging task the Warsaw International Mechanism is expected to focus on in the coming years.

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