
Loss and damage: future needs, including capacity needs associated with possible approaches to address slow onset events¹

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In adopting the 2012 Doha decision on loss and damage, Parties agreed that harm from climate change results in loss and damage and that there is an “important and fundamental role of the Convention in addressing loss and damage associated with climate change impacts.” They reaffirmed the need “to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects,” and acknowledged “the need to enhance support, including finance, technology and capacity-building, for relevant actions.”

Central to understanding the level and type of support that must be mobilized for relevant actions, as well as to outline the potential functions of an international mechanism, is to first identify the needs of developing countries. This briefing paper is a contribution to the work to identify future needs for assessing and addressing loss and damage associated with the impacts of climate change in developing countries that are particularly vulnerable to the adverse effects of climate change. It was first circulated at the Expert meeting to consider future needs including capacity needs associated with possible approaches to address slow onset events, held in 12-14 September 2013 in Nadi, Fiji.

I. Introduction

In decision 3/CP.18, in elaborating further activities under the work programme on loss and damage, Parties requested the secretariat to carry out an expert meeting to consider future needs, including capacity needs associated with possible approaches to address slow onset events. Based on the results of the meeting, the secretariat is to prepare a report for consideration by the Subsidiary Body for Implementation at its thirty-ninth session in Warsaw, Poland.

In decision 3/CP.18, Parties also decided to establish at COP19 institutional arrangements on loss and damage, such as an international mechanism. In elaborating a mechanism, an understanding of what functions that mechanism must perform, and modalities to perform its functions, will be necessary. The expert meeting, in carrying out a more detailed analysis of needs, including capacity needs associated with possible approaches to address slow onset events, was a necessary step to understanding the possible functions and modalities of an international mechanism.

The expert meeting explored the needs of developing countries that are particularly vulnerable to the adverse effects of climate change in assessing and addressing loss and damage associated with the impacts of climate change.

The focus of the expert meeting was not about capacity *per se*, but about the necessary functions that must be carried out on loss and damage. Parties at the Warsaw COP19 will need to decide on those functions that must be carried out by institutional arrangements established under the UNFCCC and which may appropriately be carried out by other international, regional, and national level institutions.

¹ Much of the information contained in this brief is a synthesis of many discussions and contributions from various Parties and individuals over the past year, including the regional meetings of the work programme.

II. Understanding slow-onset events and needs related to assessing and addressing impacts from slow onset events

Slow onset events are defined in footnote 3 of decision 1/CP.16 to include “*sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification.*” They are impacts that will manifest over time. As long as carbon dioxide emissions continue, and atmospheric CO₂ concentrations continue to increase (particularly relevant for ocean acidification) and average global temperatures continue to rise, slow onset events and their impacts will continue to increase in magnitude and severity. Many slow onset events are irreversible in nature, at least within time frames that are relevant for those alive in the 21st century.

The losses that result from these events will affect many more people than extreme events over a long period of time. Because they are persistent and develop over time, they are not amenable to many of the approaches currently under consideration for addressing extreme events, such as risk insurance and other disaster risk reduction strategies. Because these events progress and increase in impact over time, ultimately in many locations limits to the ability to adapt to their impacts will be reached and breached. Islands will be covered by seawater; increasing aridity and temperature extremes will make it impossible for crops and livestock to exist in currently productive areas; coral reefs and the fisheries dependent upon them will die.

Slow-onset events will have significant and wide-ranging impacts on people’s lives, livelihoods, and their right to sustainable development. Some of the most important consequences of slow onset events which must be considered are: loss of livelihood options; loss of territory; impacts leading to migration, forced or voluntary displacement, and planned relocation; and catastrophic impacts on food supplies and national food security.

Three brief examples of slow onset events and their consequences for livelihoods and sustainable development provide important background for our subsequent consideration of capacity needs related to approaches to address slow onset events.

Sea level rise and salinization of productive agricultural land in coastal areas, such as in Bangladesh.

Sea level rise, salinization of soils, and inundation of coastal aquifers with saline water has already affected agricultural productivity in coastal regions of southern Bangladesh. Saline intrusion in aquifers makes drinking water unpalatable, causing health impacts on those who must rely on these water sources.² Significant current migration from areas of increasing salinization has already been documented. As sea level rise continues, more areas will become uninhabitable due to these related slow onset events.

Temperature extremes and overall temperature increase. As temperatures rise, crops and animals will reach real physiological limits in their heat-tolerance and productivity. For example, pollen is extremely sensitive to extreme heat, and pollen of most crops will die at temperatures above 35°C. Extreme heat during pollination can cause extreme crop loss over large growing areas; as average temperatures rise, extreme heat events become more likely. Tropical regions in particular are threatened with both significantly reduced productivity due to slow onset temperature rise and increasing incidents of catastrophic loss from extreme heat events, which could also be coupled with and exacerbated by impacts associated with changes in precipitation.

Triple threat to fisheries of sea temperature rise, sea level rise, and ocean acidification. Although scientists are still working to understand the exact character and magnitude of impacts on fisheries from this triple threat, they have already begun to ring alarm bells. In particular, small-scale artisanal fishing, practiced along coastlines of much of the developing world, is at risk. Ocean acidification will affect the production of coral skeletons, with cascading negative consequences for the entire reef community that serves as nursery and habitat for fisheries, and for the coastal communities that are dependent on those fisheries for food and on those coral reefs for coastal protection and tourism.³ “*Substantial losses of coral reefs are projected by the time warming reaches 1.5–2°C from both heat and ocean acidification effects, with a majority of coral systems no longer viable at current locations. Most coral reefs appear unlikely to survive by the time 4°C warming is reached.*”⁴

Current approaches are not sufficient to address the impacts described above. Because of the nature of slow onset events – impacts slowly building over time and many of those impacts irreversible, with consequences of significantly diminishing or completely extinguishing the productivity of lands and fisheries, exhausting essential

² Khan, A.E. and M.I. Islam. 2011. “Water salinity and maternal health.” 5 June. <http://www.thedailystar.net/newDesign/news-details.php?nid=188591>

³ Branch, T. A., et al. In press. Impacts of ocean acidification on marine seafood. *Trends in Ecology & Evolution*.

⁴ World Bank. 2013. Turn down the heat: climate extremes, regional impacts, and the case for resilience.

water resources through glacial melt, desertification, or salinization, or completely eliminating territory – current approaches to address loss and damage are necessarily limited.

Indeed because there are very real limits to adaptation to these impacts, it is clear that traditional approaches to disaster risk reduction and climate change adaptation will not protect lives and livelihoods, nor allow continued progress towards sustainable development goals.

III. Slow onset events and gaps in current approaches, including current disaster risk reduction (DRR) and climate change adaptation (CCA) approaches

Disaster risk management (DRM) approaches include a combination of strategies and approaches for risk identification, risk reduction, preparedness, financial protection, and planning for disaster recovery. Disaster risk reduction, an element of disaster risk management, is defined as the “*practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters. Reducing exposure to hazards, lessening vulnerability of people and property, wise management of land and the environment, and improving preparedness and early warning for adverse events are all examples of disaster risk reduction.*”⁵

There has been significant recent work to bring the issue of climate change into DRM and DRR strategies. Similarly there are calls and initiatives to integrate DRM/DRR into climate change adaptation strategies. Some actors are naming these merging of approaches “climate risk management.”

Clearly there is a strong need to make sure that DRR/DRM and CCA strategies are well coordinated. Yet while there is much discussion of the need for integrated approaches, there appear to be few successful initiatives to date. For example, under Pacific Joint National Action Plans for DRM and CCA, Pacific Island countries are implementing coordinated DRM and CCA strategies, but these efforts are regionally limited and not comprehensive. A recent World Bank review notes that:

*“Over the last decade, some important lessons have emerged about what works, and what does not work, to reduce vulnerability. It is clear now that project-based DRR and CCA initiatives with relatively short time frames encourage fragmented efforts, inhibit carryover across initiatives, and ultimately do little to reduce underlying vulnerability in a lasting way. It is also clear that weak coordination and partnership between institutions involved with implementing DRR, CCA, and development limit the impact of these interventions, and that the institutional rigidity of donor organizations makes cooperation and partnership more difficult.”*⁶

The critique of these integrative approaches most relevant to the topic of the current expert meeting, however, is that the integration of climate change adaptation and disaster risk reduction will not address the challenges posed by slow onset events, including some of the most difficult to address consequences, such as loss of territory; migration, forced or voluntary displacement, and planned relocation; and catastrophic impacts on food security.

The following is a preliminary listing of four types of gaps in current knowledge and approaches that should be considered by the expert meeting. Needs related to these gaps should be identified and expanded upon:

Developing knowledge and assessing risks. Regional intergovernmental organizations, such as Caribbean Catastrophe Risk Insurance Facility (CCRIF) in the Caribbean and Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) in the Pacific, are carrying out some analysis and assessment of impacts from slow onset events. National and regional Global Climate Observing Systems and Global Ocean Observing Systems have limited funding, primarily for networking rather than for purchase of actual observation hardware. The Intergovernmental Panel on Climate Change (IPCC) and Nairobi Work Programme on Impacts, Vulnerabilities and Adaptation (NWP) partners may be collecting data on impacts, but none of this work is systematic, nor is it specifically focused on the monitoring and data gathering necessary to understand risks associated with slow onset events.

Financial measures. CCRIF has pioneered the establishment of sovereign catastrophe risk finance, with other initiatives such as PCRAFI and the Disaster Risk Financing and Insurance (DRF&I) program of the Global Facility for Disaster Reduction and Recovery (GFDRR) also providing working models for risk transfer approaches. However, because they are certain and increase over time, these risk transfer approaches are not appropriate to address loss and damage from slow onset events. Traditional risk transfer approaches will also be

⁵ <http://www.unisdr.org/who-we-are/what-is-drr>

⁶ <http://documents.worldbank.org/curated/en/2012/01/16795680/acting-today-tomorrow-policy-practice-note-climate-disaster-resilient-development-pacific-islands-region>

insufficient to address the increase in frequency and/or severity of extreme events that is anticipated from climate change.⁷

Other types of innovative financial measures will need to be developed to address impacts from slow onset events and increasing catastrophic events. These may be other types of regional or international risk sharing approaches; social safety nets and social protection schemes supported by the international community, including in the context of catastrophic impacts on food production or fisheries losses; or other financial measures appropriate for rehabilitation, reparation, migration, displacement, or planned relocation.

Migration, displacement, and planned relocation. ESCAP, the Pacific Council of Churches, the Nansen Initiative, and the International Organization for Migration,⁸ and the Asian Development Bank⁹ are all undertaking work to understand how impacts of climate change are affecting patterns of migration, displacement, and human mobility. However these studies are not being undertaken in a systematic and coordinated way, nor are they specifically focused on how these patterns are related to current and future impacts of slow onset events and lead to loss and damage.

Legal status of states under conditions of partial or complete loss of habitable territory and concomitant solidarity responsibilities of the international community. There is a clear need for the international community to address urgently and in a serious and concerted manner the complex legal and moral questions related to loss of territory from sea level rise and similar challenges associated with slow onset impacts that may transform the ability of States to fulfill basic needs of their population.

IV. Determining future institutional needs, particularly for assessing and addressing impacts related to slow-onset events

There is a clear need for new approaches to address loss and damage resulting from limits to adaptation to be taken both under the Convention itself and in collaboration with regional and global intergovernmental organizations that have mandates in related areas. During the regional meetings in 2012, developing countries have expressed a range of needs related to assessing and addressing loss and damage, and particularly for assessing and addressing impacts associated with slow onset events.

A sampling of the broad range of needs articulated during the regional meetings includes:

assessing loss and damage

- enhancement of the capacity to assess climate change impacts, in particular of slow-onset events, in a manner that can enable an understanding of socioeconomic and non-economic impacts;
- means to understand hazard, exposure, and vulnerability of human-nature systems to slow onset events, and capacity and technical support to integrate that understanding into current approaches to adaptation planning;
- assessment methodologies that go beyond a focus on primary, direct impacts, which can assess the broad range of different kinds of loss and damage that could occur (temporal, spatial, economic, non-economic, material, immaterial) and how those losses and damages interact with one another;
- scientific and technical capacity to develop understanding of impacts of slow onset events on sustainable development prospects;
- means to evaluate impacts of climate change on patterns of migration, displacement, and human mobility, and how to link those assessments with estimations of non-economic losses and damages associated with such migration and displacement;
- means to monitor impacts of slow onset events on vulnerable communities;
- means to value non-economic losses such as territory, ecosystems, sovereignty, fisheries, tourism, use of aquifers and land lost to salinization, migration, and cultural identity;

addressing loss and damage

⁷ Niehörster, F. et al. 2013. Warming of the oceans and implications for the (re)insurance industry. The Geneva Association.

⁸ <http://www.iom.int/Template/migration-climate-change-environmental-degradation/interactive-factsheet/index.html>

⁹ <http://www.adb.org/themes/climate-change/climate-induced-migration>

- means to identify limits to adaptation in the context of slow onset events, and to evaluate options within the range of approaches available to address limits to adaptation, including migration, planned relocation, and livelihoods diversification;
- enhanced understanding of potential climate-responsive social protection instruments, and how these might be used to build resilience to the impacts of slow onset events;
- need for a suite of options for financial measures to assist in coping with loss and damage from slow onset events, including sustainable sources of funding to cope with climate-induced migration and other related security issues;
- need assistance with development of adequate risk transfer and other financial options for burden-sharing after catastrophic impacts;
- capacity to develop and implement early warning systems specific to slow onset events;
- practical understanding of options and approaches for rehabilitation from slow onset events.

Institutional arrangements under the Convention, coordinated through an international mechanism on loss and damage, could carry out a range of functions related to the needs identified above, such as:

the development of knowledge bases on, inter alia:

- the range of impacts associated with slow onset events;
- possible impacts of slow onset events on vulnerable communities;
- limits to adaptation, biophysical and socioeconomic thresholds, and tipping points;
- non-economic losses, including methods for valuation of a diverse set of non-economic losses, and a range of approaches to address non-economic loss;
- the range of approaches to address loss and damage from slow onset events, including effective rehabilitation measures to address slow onset events; and
- a range of international risk sharing tools for rehabilitation from slow onset and catastrophic events;

the development and exchange of risk assessment methodologies that include:

- slow onset events;
- valuation of non-economic losses;
- impacts on sustainable development;
- impacts on vulnerable populations;
- changed migration patterns and forced displacement;

training and capacity building in risk assessment for loss and damage, including losses from slow onset events and non-economic loss;

technical and financial support for identifying, evaluating, and implementing country-appropriate options to address loss and damage from slow onset and catastrophic impacts of extreme events;

technical support and capacity to put in place early warning and response systems appropriate to slow onset events;

support for development and strengthening of insurance options, including micro and regional insurance, particularly in instances where such approaches can be useful to transfer risk;

development of financial instruments, such as debt exchange and other types of instruments, to help cope with impacts of slow onset events and other situations where insurance is inappropriate;

global coordination and convening to address more complex impacts related to loss of territory and statehood; migration, voluntary and forced displacement, and planned relocation; and catastrophic food security impacts related to country- or region-wide crop, livestock, or fisheries losses due to slow onset events.

V. Role of Convention and outside the convention

As noted above, the Doha decision contained several important conclusions relevant to the question of the role of the Convention:

- there is a need to address loss and damage;
- there is a need for a systematic means to address loss and damage; and

- the UNFCCC has an important and fundamental role to play in addressing loss and damage.

While much of the work needed on loss and damage will take place outside the umbrella of the Convention, it cannot be expected to emerge spontaneously without an institution playing a leadership, coordination, and catalytic role – a role that is logically played by the Convention. Indeed, by undertaking the current work related to loss and damage the Convention has become the de facto policy-relevant forum for discussion and work related to this challenge.

It is clear that institutional arrangements under the Convention, coordinated through an international mechanism, could in large part address the needs articulated in the previous section. Functions that could be carried out under the Convention include, but are not limited to:

Global oversight and coordination of actions. For example, there are clear needs that could be addressed under the Convention for coordination with relevant organizations on financial, technical, and associated matters; and facilitation of dialogue, collaboration, and coordination with relevant international organizations and initiatives directly involved in monitoring and addressing migration, displacement, and human mobility related to climate change extreme and slow onset events.

Enhanced cooperation, collaboration, and linkages with regional and global institutions on loss and damage associated with climate change. For example, slow onset impacts on food production and fisheries, with related impacts on food security, will require much closer collaboration and cooperation in the future with the UN Food and Agriculture Organization and the World Food Program, as well as the global meteorological community.

Knowledge development and exchange. This is a clear and compellingly articulated need expressed by countries, both with regard to development, gathering, and storing of the broad range of knowledge indicated above, as well as enhanced mechanisms for sharing knowledge.

Support for implementation of the wide range of approaches identified to address loss and damage. Technology, capacity building, and financial support will all be required to address loss and damage. A mechanism under the Convention should serve the function to facilitate and catalyze support, including through identification of new, predictable, and reliable support for the development and operationalization of actions to assess and address loss and damage.

Facilitating and catalyzing the development of innovative financial measures. Slow onset impacts and increasing loss and damage due to extreme events and erosion of coping capacities will require enhancing existing measures and the development of new measures, including innovative climate-responsive social protection instruments and risk transfer and risk sharing mechanisms. The loss and damage mechanism to be established under the Convention would carry out this work to ensure enhanced action on addressing loss and damage.

Institutional actions outside the Convention

While it is clear that the Convention must play a leading convening role globally to provide oversight, coherence, and coordination, this does not mean that it would need to undertake all the work required on loss and damage at the global level. In some key instances it will play a leadership role to foster initiatives to be undertaken by other actors. Other important international institutions and initiatives that will contribute to addressing loss and damage include, inter alia:

On issues of migration, voluntary and forced displacement, and planned relocation: the International Organization of Migration (IOM) and the Nansen Initiative.

On risk transfer initiatives: the Caribbean Catastrophe Risk Insurance Facility (CCRIF), the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), and the Disaster Risk Financing and Insurance (DRF&I) program of the Global Facility for Disaster Reduction and Recovery (GFDRR).

VI. Conclusion

Loss and damage associated with the impacts of climate change in developing countries that are particularly vulnerable to the adverse effects of climate change are inevitable. Moreover, the potential scope and magnitude of this loss and damage are mounting with each passing day that mitigation efforts remain inadequate to stop increasing atmospheric greenhouse gas concentrations.

With the Doha decision, Parties agreed that there is a need to address loss and damage, and need for a systematic means to address loss and damage. The next steps toward addressing loss and damage are to identify needs of developing countries, and to design an international mechanism with functions and modalities to address those needs. The outcome of the COP19 is a crucial contribution to these next steps.