BEYOND ADAPTATION

The legal duty to pay compensation for climate change damage

WWF-UK
Climate Change Programme
discussion paper

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ONE PLANET FUTURE

If everyone in the world consumed natural resources and generated carbon dioxide at the rate we do in the UK, we would need three planets to support us. The impacts – which include climate change, deforestation and biodiversity loss – are starting to affect us all.

WWF has a vision for a One Planet Future – a world in which people and nature thrive within their fair share of the Earth's natural resources. Our One Planet Future campaign supports individuals and businesses in reducing their footprint, while pressing governments and industry to make the changes needed for us all to lead a one planet lifestyle.

We have been born into a decisive period in human history. The choices we make today will make a world of difference to the people and species that will share this planet's future.

WWF-UK Climate Change Programme
WWF-UK is working along with the global WWF Network to convince world leaders to secure a strong and equitable global deal to tackle climate change, at the UN climate summit in Copenhagen in December 2009. We engage with government, business and local communities to deliver effective solutions to climate change, and to mobilise public concern and action. We also help some of the world's most vulnerable places, species and people to adapt where possible to the impacts of climate change.

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Contents

“In a world preoccupied with issues of national sovereignty, global security and human rights, it is surprising that the international community remains so ambivalent in the face of a phenomenon – climate change – that threatens to rewrite borders, cause conflicts, and violate individual fundamental rights on a scale at least comparable with the major wars of the 20th century. It is also curious that in a world order built upon concepts of international law, solidarity and justice, the international community sits idly by while the Earth’s greatest natural resource – the shared global ecosphere – is being critically undermined by the actions of a few privileged countries at the expense of the underprivileged many.”

Maumoon Abdul Gayoom, former President of the Maldives, September 2008

“States shall… cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.”

Rio Declaration 1992, Principle 13

Preface

Climate change is upon us, and without hard and fast emissions reductions and comprehensive action on adaptation the world will experience an ever higher degree of climate change aggravated damage. However, the UNFCCC process currently lacks a coherent framework to address the issue of what happens when damage becomes too severe for adaptation to be possible. Given the complexity of the issue, WWF-UK has commissioned experienced climate lawyers to provide clarity and to review the options for addressing damage and compensation within the UNFCCC process.

This discussion paper is timely. In order to advance work on elements of the Bali Action Plan, the UNFCCC Poznan meeting – from 1-12 December 2008 – will have an in-session workshop on 'Risk management and risk reduction strategies, including risk sharing and transfer mechanisms such as insurance'. A related component of the Bali Action Plan addresses 'disaster risk reduction strategies and the means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change'.

The result of the lawyers' work for WWF-UK is the discussion paper *Beyond adaptation: the legal duty to pay compensation for climate change damage*. It considers ways to address loss and damage associated with climate change impacts on developing countries. It focuses on international law principles and the implementation of the polluter pays principle.

The paper shows that the possibility of legal action against major-polluting countries is increasing and could lead to a raft of complex uncoordinated legal cases. The authors suggest that a compensation mechanism under the UNFCCC could be the best way to address the issue. The analysis concludes that the international community can draw upon numerous legal principles and precedents from other areas and apply them to the climate change context.

Based on these insights provided by the WWF-UK paper, I believe that the outlook of facing legal action and obligations to pay compensation should drive industrialised nations to reduce this risk by rapidly reducing domestic emissions and by financing adaptation measures in the most vulnerable countries.

I believe that this is a complex and emerging issue that will need further substantial consideration. This paper represents a vital first step in a longer-term process to clarify and develop this important issue within the international climate arena. I know that WWF-UK is keen to support this process and to collaborate with a range of stakeholders as this issue develops in the coming months.

I hope that this discussion paper will assist all stakeholders in thinking through possibilities for an equitable system to address damage resulting from climate change, particularly in vulnerable developing countries, provide material for further discussion and, in the words of the paper, "contribute to the development of a suitable regime to address one of the most glaring injustices of our time".

Kim Carstensen

Leader, WWF Global Climate Initiative

Introduction

This discussion paper explores how international legal rules and precedents can be used by the global community to address a significant gap in the international climate change regime – the absence of a system by which countries that have contributed most to greenhouse gas (GHG) pollution will pay compensation for climate change damage suffered by particularly vulnerable developing countries, which will suffer the most from the adverse effects of climate change.

Under the Bali Action Plan, Parties to the UN Framework Convention on Climate Change (UNFCCC) have expressly agreed to consider ways of addressing loss and damage to enhance the implementation of the Convention's provisions on adaptation. The international climate change negotiations at the Fourteenth Conference of the Parties (COP 14), to be held in Poznan, Poland from 1-12 December 2008, and the sessions that follow offer an important opportunity to initiate a discussion of an appropriate liability and compensation scheme, tailored to unavoided and unavoidable damage from climate change impacts, to plug a growing gap in the current regime.

Chapter 1 of this discussion paper notes the scientific consensus that the global climate is changing and that man-made GHG emissions have caused most of the warming observed since the 1950s. An increase of 0.74°C in global surface average temperature has already been seen over the last century, and a further increase of 1.1-6.4°C is projected by the Intergovernmental Panel on Climate Change (IPCC) during the 21st century.[1] This will result in still further sea level rise, glacial melting, changes in precipitation, ocean salinity and wind patterns, and changes in aspects of extreme weather events, including droughts, heavy precipitation, heatwaves and the intensity of tropical cyclones.[2] While the international climate change regime sets up a structure for addressing the adaptation needs of countries suffering from the adverse effects of climate change, adaptation funding is not available at the scale needed to avoid substantial climate change damage. The present regime does not include a means to address loss and damage due to climate change impacts.

Chapter 2 describes the well-established rules of customary international law that would support claims for loss and damage due to the impacts of climate change. The '*no-harm rule*' requires States to prevent damage and to minimise the risk of damage to other States. The objective standard of care required will not be met where a State has failed to take proportionate measures to prevent damage to other States from activities which that State knew, or should have known, contributed to a risk of such damage. The rule of '*State responsibility*' holds an offending State responsible for the cost of preventing damage and addressing unavoided damage, as a legal consequence of a breach of the no-harm rule. These rules of customary international law continue to apply to climate change damage, and regulate behaviour among States with respect to climate change damage, despite the existence of the UNFCCC and the Kyoto Protocol.

Chapter 3 considers whether the three key criteria used to determine compliance with customary international law's no-harm rule have been met in the climate context: an opportunity to act; foreseeability of harm; and proportionality of response. It concludes that many developed countries have had the opportunity to reduce their GHG emissions; many have been well aware or should have been well aware of the effect of increasing atmospheric concentrations of CO_2 on the Earth's heat balance and the potential risk of consequent damage; and many have failed to take proportionate measures in the face of this risk, instead continuing to generate what we term 'excess' emissions. Hence claims by particularly vulnerable developing countries against specified developed countries, alleging violation of the no-harm rule and seeking compensation, would have a firm basis in international law if brought before an appropriate tribunal. Cumbersome individual cases should not however be the path of choice; international law is

[1] Summary for Policymakers, Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR4 WGI SPM) at 5 and 13.

[2] Id. at 7.

founded on notions of cooperation and the avoidance of adjudication where possible. A negotiated treaty to address unavoided and unavoidable loss and damage is likely to be a far more appropriate and practical solution to addressing climate change damage.

Chapter 4 identifies international law principles and precedents that provide support for the negotiation of a compensation instrument, as a necessary and appropriate response to the regulatory gap. The many precedents include the nuclear damage regime, the oil spill conventions and compensation regime, regimes created to address accidents in the context of the transportation of hazardous or dangerous substances, and environmental damage resulting from a range of activities. In each of these situations, concerted effort among nations has successfully addressed compensation needs arising from transboundary environmental pollution.

Chapter 5 considers some of the key elements that a compensation and liability scheme to address loss and damage from climate change might need to contain, as well as principles that might inform decisions on the scheme's design options. It sets out some of the key issues for consideration with respect to each element and makes plain that while the negotiation of a compensation regime for climate change damage would not be an easy task, the technical issues can be resolved.

The paper concludes that further discussion on the possible elements of such a regime is a necessary step in moving the climate change regime forward. The Bali Road Map offers this opportunity in the context of the post-2012 negotiations. It is hoped that this discussion paper, and future work, will contribute to the development of a suitable regime to address one of the most glaring injustices of our time.

1 Climate impacts, climate change damage and the gap in the climate regime

A CLIMATE CHANGE DAMAGE IS NOW TAKING PLACE DUE TO MAN'S OWN ACTIONS

The scientific community agrees that the Earth's climate is changing. The IPCC has concluded that:

> "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level."[3]

The IPCC's Fourth Assessment Report (AR4) has also found that most of the warming of the Earth since the 1950s has been due to man's own actions, primarily through emissions from the burning of fossil fuels:

> "The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined by ice cores…
>
> The primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use, with land-use change providing another significant but smaller contribution. Annual fossil fuel carbon dioxide emissions [footnote omitted] increased from an average of 6.4 [6.0 to 6.8] GtC … per year in the 1990s to 7.2 GtC [6.9 to 7.5] per year in 2000-2005."[4]

According to IPCC AR4, the Earth has already seen an increase in global surface average temperature of 0.74°C over the 100 years up to 2005.[5] Temperature increases far greater than this average have been experienced in some parts of the world.[6] Observed changes associated with this warming include sea level rise, glacial melting, changes in precipitation amounts, ocean salinity, wind patterns, and changes in aspects of extreme weather events, including droughts, heavy precipitation, heatwaves and the intensity of tropical cyclones.[7] Climate model projections, summarised by the IPCC using a range of future scenarios, estimate that further increases of 1.1-6.4°C (2-11.5°F) in global average surface temperature are likely during the 21st century.[8]

However, since the AR4 was released, even more alarming scientific evidence has been presented which shows that the pace of climate change is exceeding even the most aggressive of the IPCC's emission scenarios.[9] This does not bode well for vulnerable communities around the globe that are already suffering from the impacts of climate change.

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[3] IPCC AR4 WGI SPM at 5.

[4] Id. at 2.

[5] Id. at 5.

[6] See id. at 7, noting for example that temperatures in the Arctic have increased at almost twice the global average rate over the last 100 years.

[7] Id. at 7.

[8] Id. at 13, noting that the best estimate for the low scenario is 1.8°C (likely range is 1.1-2.9°C) and the best estimate for the high scenario is 4.0°C (likely range is 2.4-6.4°C).

[9] For an overview of post-AR4 scientific publications and a sampling of their findings, see Climate change: faster, stronger, sooner: A European Update of climate science (WWF, 2008), available at http://assets.panda.org/downloads/wwf_science_paper_october_2008.pdf. Among these findings are the following: the Arctic Ocean is losing sea ice 30 or more years ahead of projections in the AR4 and could very soon be ice-free during the summer; floating tide-water glaciers in the Antarctic Peninsula are losing ice faster than reported in AR4; new studies have projected global sea level rise by the end of the century to more than double the maximum AR4 estimate of 0.59m presented in the IPCC Third Assessment Report; growth in CO_2 emissions since 2000 was greater than any of the scenarios used in AR4; the capacity of land and oceans to

The UNFCCC aims to stabilise GHG emissions at a level that would prevent dangerous human interference with the climate system.[10] Some countries have urged that to be consistent with this aim, global average temperature must not be permitted to rise more than 2°C above pre-industrial levels. Some researchers have suggested that present emissions may already have locked in a temperature increase in excess of 2°C.[11] Vulnerable developing countries have emphasised that they are *already* experiencing what is for them dangerous climate change.

It is increasingly clear that if significant and ambitious mitigation efforts are not agreed and implemented with the urgency that best available science demands – if a quantum leap in these efforts is not made – climate change will lead to further and unimaginable damage around the world. The only remaining question will be the pace, location and extent of this damage.

Adaptation measures will help to reduce some of the future loss and damage that will result from increasing temperatures. But even ambitious mitigation measures will not be enough to prevent further damage to those most vulnerable to the impacts of climate change. As the IPCC puts it:

> "There is high confidence that neither adaptation nor mitigation alone can avoid all climate change impacts. Adaptation is necessary both in the short term and longer term to address impacts resulting from the warming that would occur even for the lowest stabilisation scenarios assessed." [12]

The IPCC has noted numerous examples of future changes that it projects with a particularly high degree of certainty, and which can be expected to result in some degree of damage and loss. As can be seen below, developing countries will continue to be particularly hard hit.

Changes expected in small islands with "very high confidence"[13]

- "Sea level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities."
- "Climate change is projected by mid-century to reduce water resources in many small islands, e.g., in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low-rainfall periods".

Changes expected in Africa, Asia, Latin America and small islands with "high confidence"

Africa

- "By 2020, between 75 million and 250 million people are projected to be exposed to increased water stress due to climate change. If coupled with increased demand, this will adversely affect livelihoods and exacerbate water-related problems."
- "Agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The area suitable

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absorb CO_2 is declining at a greater rate than previously forecast; a re-examination of the climate impacts reported in AR4 indicates that an 80% cut (rather than a 50% cut) in global GHG emissions relative to 1990 levels is needed by 2050 to avoid a global average temperature rise of 2°C above pre-industrial levels; an 80% cut would stabilise atmospheric GHG concentration at 400-470 parts per million in carbon dioxide equivalents, but even with an 80% emissions cut, damages will be significant.

[10] Article 2 of the UNFCCC provides: "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

[11] The recent analysis by Ramanathan and Feng argues that the observed increase in GHG concentrations since the pre-industrial era has most likely committed the world to a warming of 2.4°C (1.4°C-4.3°C) above pre-industrial surface temperatures: see On avoiding dangerous anthropogenic interference with the climate system: Formidable challenges ahead, 23 September 2008, www.pnas.org/content/105/38/14245.abstract.

[12] IPCC AR4 Synthesis Report at 65.

[13] The IPCC uses "very high confidence" to express a 9 out of 10 chance of being correct; "high confidence" as about an 8 out of 10 chance. Guidance Notes for lead authors of the IPCC Fourth Assessment Report on addressing uncertainties (2006).

for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. This would further adversely affect food security and exacerbate malnutrition in the continent. In some countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020."

- "Local food supplies are projected to be negatively affected by decreasing fisheries resources in large lakes due to rising water temperatures, which may be exacerbated by continued over-fishing."
- "Towards the end of the 21st century, projected sea-level rise will affect low-lying coastal areas with large populations. The cost of adaptation could amount to at least 5-10% of Gross Domestic Product (GDP). Mangroves and coral reefs are projected to be further degraded, with additional consequences for fisheries and tourism."

Asia

- "Freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease due to climate change which, along with population growth and increasing demand arising from higher standards of living, could adversely affect more than a billion people by the 2050s."
- "Coastal areas, especially heavily-populated mega delta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some mega deltas, flooding from the rivers."
- "Endemic morbidity and mortality due to diarrhoeal disease primarily associated with floods and droughts are expected to rise in East, South and South-East Asia due to projected changes in the hydrological cycle associated with global warming. Increases in coastal water temperature would exacerbate the abundance and/or toxicity of cholera in South Asia."

Latin America

- "By mid-century, increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savannah in eastern Amazonia. Semi-arid vegetation will tend to be replaced by arid-land vegetation. There is a risk of significant biodiversity loss through species extinction in many areas of tropical Latin America."
- "In drier areas, climate change is expected to lead to salinisation and desertification of agricultural land. Productivity of some important crops is projected to decrease and livestock productivity to decline, with adverse consequences for food security. In temperate zones soybean yields are projected to increase."
- "Sea-level rise is projected to cause increased risk of flooding in low-lying areas. Increases in sea surface temperature due to climate change are projected to have adverse effects on Mesoamerican coral reefs, and cause shifts in the location of south-east Pacific fish stocks."
- "Changes in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human consumption, agriculture and energy generation."

Small islands

- "Deterioration in coastal conditions, for example through erosion of beaches and coral bleaching, is expected to affect local resources, e.g., fisheries, and reduce the value of these destinations for tourism."
- "With higher temperatures, increased invasion by non-native species is expected to occur, particularly on mid- and high-latitude islands."

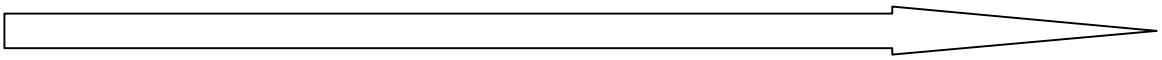
Source: IPCC AR4 WGII SPM.

B THE CLIMATE REGIME FAILS TO ADDRESS CLIMATE CHANGE DAMAGE

The Convention and the Kyoto Protocol contain commitments on the mitigation of GHG emissions and on adaptation to the adverse effects of climate change. However, these do not guarantee to address and redress all the climate change damage suffered by particular countries.

For the purposes of regulatory responses, there are three types of climate change damage. Some foreseeable loss and damage will be **avoided**, due to the mitigation of GHG emissions or timely adaptation measures. Some foreseeable loss and damage will **not be avoided**, due to insufficient mitigation efforts and delays in accessing adequate adaptation funding and technologies, or challenges in institutional capacity. Finally, some loss and damage is **unavoidable**, regardless of future adaptation measures to be undertaken. This final category includes, for example, land that has been and will be lost due to sea level rise, agricultural land lost to persistent drought, and lives that have been and will be lost due to increasingly severe extreme weather events.

Box 1: Categories of damage



Avoided	Unavoided	Unavoidable
Avoidable damage avoided → Damage prevented through mitigation and/or adaptation measures.	Avoidable damage and loss not avoided → Where the avoidance of further damage was possible through adequate mitigation and/or adaptation, but where adaptation measures were not implemented due to financial or technical constraints.	Unavoidable damage and loss → Damage that could not be avoided through mitigation and/or adaptation measures; e.g., coral bleaching, sea level rise, damage due to extreme events where no adaptation efforts would have helped prevent the physical damage.

In addition to commitments on mitigation, the climate regime's approach with respect to these categories of damage is essentially one of adaptation. It currently consists of:

(i) an obligation on all Convention Parties to implement measures to facilitate adequate adaptation, under Article 4.1(b);

(ii) obligations on Annex II Parties to finance and support developing country adaptation measures under Articles 4.3, 4.4, and 4.5, reflecting the principle of common but differentiated responsibilities enshrined in Article 3.1[14] and recognising that the extent to which developing countries meet their commitments on adaptation depends on these efforts by developed countries[15];

(iii) evolving obligations to generate information on adaptation needs, under Article 12.1;

(iv) an adaptation funding architecture under the Convention and Kyoto Protocol, supplemented by bilateral funding (see Box 2, below); and

(v) structures to generate information on adaptation needs and efforts – through reporting under Article 12.1; through National Adaptation Programmes of Action (NAPAs)[16]; and through the ongoing Nairobi Work Programme.

[14] Article 3.1 calls for the protection of the climate for the "benefit of present and future generations… on the basis of equity" (intra- and intergenerational equity) and establishes the notion of "common but differentiated responsibility", which results in the obligation of developed country Parties to "take the lead in combating climate change and the adverse effects thereof". This leadership role for industrialised countries is reiterated both in the preamble to the UNFCCC (paragraphs 3 and 18) and in Article 4.2 (b). Paragraph 3 of the preamble explicitly notes that "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs". See Verheyen, 77 f. Annex II refers to Annex II of the Convention which includes, mostly, the group of OECD countries.

[15] Article 4.7 of the Convention explicitly acknowledges that "the extent to which developing countries will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing countries." For more details on these rules, see: Verheyen, The Legal Framework of Adaptation and Adaptive Capacity, in Huq/Klein/Smith: Climate Change, Adaptive Capacity and Development (2003).

[16] See Decisions 5/CP.7, 27/CP.7 and 28/CP.7 (FCCC/CP/2001/13/Add.1 and 4). By September 2008, 38 of 48 LDCs had submitted NAPAs. See the ongoing work programme aimed at generating more information: Germanwatch/WWF – Adaptation under the UNFCCC – The Road from Bonn to Poznan 2008, Version August 2008 (noting the will within developing countries to engage in adaptation efforts, but the limitations imposed on these efforts by funding constraints).

Box 2: The Adaptation Funding Architecture

1. **Global Environment Facility** – named under the Convention as an operating entity of the Convention's financial mechanism. This includes funding for reporting on adaptation needs through national communications, and the **GEF Strategic Priority on Adaptation (SPA),** a special adaptation component funded from the general climate change budget of the GEF.[17] Contributions to the GEF are voluntary.
2. **Least Developed Countries Fund (LDCF) –** established under the Convention to support a work programme to assist Least Developed Country Parties (LDCs), including the preparation and implementation of National Adaptation Programmes of Action. 'Full-cost funding' is provided "to meet the additional costs of activities to adapt to the adverse effects of climate change as identified and prioritized in the national adaptation programmes of action".[18] Contributions have been voluntary.
3. **Special Climate Change Fund (SCCF)** – established under the Convention to finance activities complementary to those funded by the resources allocated to the Global Environment Facility (GEF) and bilateral and multilateral funding. Eligible activities include adaptation, technology transfer, energy, transport, industry, agriculture, forestry and waste management, as well as activities to help developing countries diversify their economies.[19] Contributions have been voluntary.
4. **Adaptation Fund (AF)** – established under Article 12.8 of the Kyoto Protocol and Decision 10/CP.7 and 1/CMP.3 to fund "concrete adaptation projects and programmes" that are country driven and are based on the "needs, views and priorities" of particularly vulnerable developing countries.[20]
5. **Bilateral, regional and other multilateral channels** – as per Article 11.5 of the Convention. Contributions are voluntary.

However, this funding architecture has been plainly *inadequate* to generate the funding needed for adaptation. Taking current levels of international finance and projections,[21] and estimating optimistically, adaptation finance of the order of millions of dollars per year might become available, compared with the Oxfam estimate of over US$50 billion per year that is required. This includes Adaptation Fund revenues through the levy on clean development mechanism (CDM) projects.

[17] See: Operational Guidance for the SPA, GEF/C.27/Inf.10, www.thegef.org

[18] Decision 3/CP.11 (FCCC/CP/2005/5/Add.1). To overcome the problem of identifying "additional costs", the GEF has developed a so-called sliding scale to serve as a rule of thumb for necessary co-financing for projects.

[19] See Decisions 7/CP.7 (paras. 2 and 6), 5/CP.9 and 1/CP.12.

[20] Article 12.8 of the Kyoto Protocol provides that the Protocol Parties "shall ensure that a share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation". Decision 10/CP.7 established the Adaptation Fund (FCCC/CP/2001/13/Add.1). Governance of the fund has been agreed through a series of subsequent decisions taken by the Protocol Parties, the most notable of which is Decision 1/CMP.3 (FCCC/KP/CMP/2007/9/Add.1). The operating entity of the Adaptation Fund is an Adaptation Fund Board. The GEF is to provide secretariat services and the World Bank is to serve as fund trustee on an interim basis, with these interim institutional arrangements to be reviewed after three years.

[21] For an overview of ODA activities see FCCC/TP/2007/7. A Climate Investment Fund was approved by the World Bank Board in July 2008. It will hold two trust funds: a Clean Technology Fund and a Strategic Climate Fund, which will provide funding for adaptation in the form of grants or loans, as "a pilot aimed at increasing climate resilience in developing countries". Donors have pledged US$6.1 billion to the Climate Investment Funds. It is not clear what proportion will go to which fund and programme. See www.worldbank.org/cif. World Bank Press Release, Washington, 26 September 2008: Donor Nations Pledge Over $6.1 Billion to Climate Investment Funds boost global fight against climate change.

Estimates of the costs of adaptation	
World Bank (infrastructure only)	US$9-41bn per year[22]
Oxfam	>US$50bn per year[23]
UNFCCC presentation	US$28-67bn per year in 2030[24]
Adaptation finance available	
LDCF	US$172m received in total (not per year)[25]
SCCF	US$91m in total pledges to the Adaptation Programme of the SCCF, now closed for adaptation projects[26]
AF (not operational)	US$80-300m total from 2008-2012
GEF SPA	US$50m total from 2006-2010 (GEF 4-replenishment)[27]
Bilateral and multilateral	Size unclear to date

The inadequacy of adaptation funding under the Convention and Protocol is further compounded by the structural inadequacy of the regime itself: the climate regime has no regulatory response to unavoided and unavoidable damage, and does not address how losses from these two types of damage should be borne. While it has been said that Article 4.4 "amounts to an implicit acceptance by developed country parties of responsibility for causing climate change",[28] the climate regime lacks rules on when and how unavoided and unavoidable damage should be compensated. This is a clear gap in the regime that remains to be filled.

C THE BALI ACTION PLAN: THE OPPORTUNITY TO CLOSE THE GAP

As significant loss and damage from climate change increases, so does the need to consider how international law bears upon the issue. The international community has committed itself to increasing efforts to develop international law on liability and compensation for the victims of pollution damage. In 1972, States committed to develop international law on liability and compensation for environmental damage.[29] In 1992, through the Rio Declaration, States agreed to increase their efforts in this regard:

> "States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction." [30]

[22] World Bank, Clean Energy and Development: Towards an Investment Framework, DC2006-0002, 2006.

[23] Oxfam: Adapting to Climate Change, What is needed in poor countries and who should pay, 2007.

[24] Smith, Joel, Preliminary estimates of additional investment and financial flows needed for adaptation in 2030, Presentation at FCCC Workshop: Dialogue on Long-Term Cooperative Action, Vienna, 28 August 2007.

[25] See progress report on the SCCF and the LDCF, October 2008, GEF/LDCF.SCCF.5/Inf.3. For more detail on pledges: Status Report on the Climate Change Fund GEF/LDCF.SCCF.4/Inf.1. Over US$700 million is needed to implement the Ethiopian NAPA alone. See The Federal Democratic Republic of Ethiopia, Climate Change National Adaptation Programme of Action (NAPA) of Ethiopia (2007) at 55.

[26] GEF/LDCF.SCCF.5/Inf.3 at 7.

[27] In 2006, 32 donor countries pledged US$3.13 billion to GEF operations between 2006 and 2010 (GEF 4 replenishment). Of this sum, US$50 million was set aside for the SPA. See www.thegef.org

[28] Sands, Principles of International Environmental Law (2nd edition, 2005) at 366 and R.J.T. Klein, 2007: The Global Environment Facility: Funding for Adaptation or Adapting to Funds? Climate and Energy Programme Working Paper, Stockholm Environment Institute, Stockholm, Sweden. www.sei.se/editable/pages/sections/climate/publications/climate_energy_working_moehner_klein.pdf

[29] Stockholm Declaration on the United Nations Conference on the Human Environment, Principle 22, 11 ILM 1416 (1972).

[30] Rio Declaration on Environment and Development, United Nations Conference on Environment and Development, Principle 13, 31 ILM 874 (1992).

Yet, despite calls for compensation in the climate change negotiations from a number of particularly vulnerable developing countries[31], the issue of climate change damage remains to be squarely addressed.

Under COP 13's Bali Action Plan, Convention Parties are considering "a shared vision for long-term cooperative action, including a long-term goal for emission reductions to achieve the ultimate objective of the Convention" in the lead up to the Copenhagen COP in December 2009. They are also considering ways to enhance implementation of the Convention's obligations on adaptation, including insurance and funding. One category of elements expressly agreed for consideration is "disaster risk reduction strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change". Another is "risk management and risk reduction strategies, including risk sharing and transfer mechanisms such as insurance".[32] In-session workshops to be held at COP 14 are likely to raise the issue of unavoidable impacts in the context of extreme weather events.

Thus COP 14 presents a unique opportunity to consider next steps in addressing climate change impacts that are avoidable through risk reduction measures, and impacts that are already unavoided or unavoidable and warrant compensation.

With this opportunity in view, the following chapters explore how rules of customary international law require countries to prevent, and provide compensation for, climate change damage (Chapters 2 and 3); offer precedents for liability and compensation schemes that the international community might draw upon in the climate change context (Chapter 4); and identify necessary elements of a compensation regime and possible guiding principles (Chapter 5).

[31] See, for example, Submission from AOSIS to the Dialogue on long-term cooperative action to address climate change (Working Paper No. 14, 24 August 2007) at 7 ("Where adaptation cannot fully address the impacts of climate change on countries and their communities, impacted countries are justified in seeking compensation from those countries most responsible for the greenhouse gas emissions that have led to those impacts"). At COP 11 in Montreal in 2005, Bangladesh, on behalf of the LDCs, called for compensation for damages caused by climate change. See, for example, http://www.iisd.ca/vol12/enb12291e.html. The Alliance of Small Island States and the Group of Least Developed Countries have raised this issue in oral interventions at a number of international negotiating sessions.

[32] 1/CP.13 paras. 1(c)(ii) and 1(c)(iii).

2 Customary international law on damage and compensation

Article 38 of the Statute of the International Court of Justice (ICJ) defines customary international law as "evidence of general practice accepted as law", and the ICJ has stated that customary law arises when a practice among nations is extensive and virtually uniform and is accompanied by a conviction that it is obligatory under international law (*opinio juris)*.[33]

A widely-recognised rule of customary international law is the no-harm rule, which essentially holds that no State must harm another. This rule provides a basis for consultation and negotiation in the case of transboundary environmental disputes. It requires a State to prevent damage and to minimise the risk of damage to other States. Both avoidable and unavoidable climate change damage fall within the ambit of legal consequences of a breach of the no-harm rule, so that financing and implementing adaptation measures – as addressed in the climate regime – are just as much a legal consequence of a breach of international law as the provision of compensation for loss and damage.

A THE NO-HARM RULE PROHIBITS STATES FROM DAMAGING OTHER STATES

The no-harm rule's applicability in the environmental context is not controversial. It has been widely recognised and can provide affected States with a basis for diplomatic consultation and negotiation, as well as legal action, in transboundary environmental disputes.

This rule was most famously used in the 1938-1941 *Trail Smelter Arbitration*[34] and was restated by the International Court of Justice (ICJ) in the 1949 *Corfu Channel Case*[35], where the court observed that there were "general and well-recognised principles" of international law concerning "every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States" and by the Arbitral Tribunal in the 1956 *Lac Lanoux arbitration*[36]. It has also been reiterated in the preamble to the UNFCCC.[37] In 1996, the ICJ declared that:

> "the existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment."[38]

This means that the rule is applicable to each and every State, without distinction, and without the need for a specific international treaty to rely on.

States have a duty both to prevent damage and minimise risk. The no-harm rule contains a general obligation to prevent substantial transboundary harm and minimise the risk of transboundary damage. The rule thus creates legal obligations before any harm has occurred.[39]

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[33] See North Sea Continental Shelf cases (West Germany v Netherlands; West Germany v Denmark), 1969 ICJ Rep. 43-44. See also the Nicaragua Case, 1986 ICJ Rep. 14 at 97-100 and 106-109.

[34] United Nations, Reports of International Arbitral Awards, vol. III, 1906, 1982.

[35] 1949 ICJ Rep. 4.

[36] 1957 I.L.R. 101.

[37] UNFCCC, Preamble, 9th paragraph.

[38] Advisory Opinion of the ICJ in the Legality of the Threat or Use of Nuclear Weapons (1996) ICJ Reports 241, para. 29. The 'no harm' rule was re-stated and accepted by both parties (Hungary and Slovakia) in the Gabčikovo case (1997 ICJ Rep. 7, in particular at 41), and other examples can be found in the 1992 Rio Declaration, Principle 2; the 1992 Biodiversity Convention, Article 3; the 1985 Vienna Convention for the Protection of the Ozone Layer, Preamble, 2nd paragraph; Principle 21 of the 1972 Stockholm Declaration; and UN General Assembly, Resolution 2996 (XXVII), 15 December 1972.

[39] See for views of States UN Doc. A/CN.4/509, International liability for injurious consequences arising out of acts not prohibited by international law (prevention of transboundary damage from hazardous activities), Report of the Secretary-General, Comments made by States. See also summary of the law in: UNEP/CBD/WS-L&R/2, Liability and Redress under the Convention on Biological

It is applicable to all activities that contribute to a particular risk and does not require a State to be capable of preventing the damage altogether. The rule is a pure duty of conduct, and no intent to cause harm is needed. As long as an activity can be reasonably shown to cause damage or risk thereof, the prevention duty applies, regardless of the physical character of the activity.

Most recently a subset of rules contained in the no-harm rule have been codified by the International Law Commission (ILC)'s 2001 Draft Articles on Prevention of Transboundary Harm from Hazardous Activities[40]. Evidence of the existence, and examples of the formulation, are ample.[41] The precise content of the rule could be taken from the 3rd Restatement of US Foreign Relations Law,[42] which provides a persuasive interpretation of international law from the perspective of US and other scholars and practitioners:

> "(1) A State is obligated to take such measures as may be necessary, to the extent practicable under the circumstances, to ensure that activities within its jurisdiction or control:
> (a) conform to generally accepted international rules and standards for the prevention, reduction, and control of injury to the environment of another State or of areas beyond the limits of national jurisdiction; and
> (b) are conducted so as not to cause significant injury to the environment of another State or of areas beyond the limits of national jurisdiction."

However, as the above formulation shows, not every activity that poses a risk of transboundary damage is prohibited under the no-harm rule. In the climate context for example, international law would not support a conclusion that a State emitting GHGs and thus contributing to global climate change should be held responsible for damage occurring *per se,* simply because it has emitted such gases.[43] Instead, the no-harm rule is a fault-based rule. A State's behaviour must be found contrary to a specific standard of care. Once this duty of care is defined, if a State fails to take proportionate measures to minimise the risk of foreseeable damage, the no-harm rule is breached. There is a strong parallel to what is well known as negligence or due diligence under national law in all legal systems.

Generally, the due diligence standard can be described as the conduct that can be expected of a good government, in terms of an *objective and international* standard. Common elements discernible in writings and jurisprudence present the following elements of a standard of care:

> (i) the opportunity to act or prevent;
> (ii) foreseeability or knowledge that a certain activity could lead to transboundary damage; and
> (iii) proportionality in the choice of measures to prevent harm or minimise risk.

These elements can be applied in the context of climate change damage.

Diversity, Review of relevant international legal instruments and issues for consideration, Note by the Executive Secretary, 21 May 2001.

[40] Adopted by the ILC at its fifty-third session, in 2001, and submitted to the General Assembly as a part of the Commission's report covering the work of that session (A/56/10). The Draft articles, with commentaries, may be found at: http://untreaty.un.org/ilc/texts/instruments/english/commentaries/9_7_2001.pdf . The ILC was established under General Assembly Resolution 174 (II) of 21st November 1947, with the object of promoting "the progressive development of international law and its codification". There are currently 34 ILC members, elected by the General Assembly from candidates proposed by States. The members serve in their personal capacity as individuals of recognised competence in international law. See: http://www.un.org/law/ilc/index.htm

[41] See for further evidence in jurisprudence and state practice Verheyen, pp. 147 ff.

[42] American Law Institute, Third Restatement (1987) Vol. II at 103, section 601: State obligations with respect to environment of other States and the common environment.

[43] Writers have also stated that due to the "obligation not to allow the territory of one State to be used to generate conditions leading the to catastrophic consequences of global warming and sea level rise", it may "not [be] necessary to show that the developed States had knowledge that their activities were damaging.", Cameron/ Zaelke, Global warming and climate change – an overview of the international legal process, 5 American University Journal of International Law & Policy (1990) 262.

B STATE RESPONSIBILITY FOR BREACH OF THE NO-HARM RULE

A State's failure to comply with the no-harm rule is an internationally wrongful act that gives rise to an obligation to pay compensation. A State's breach of obligations not to cause damage, to prevent harm, or to minimise sufficiently the risk of harm occurring, would constitute an internationally wrongful act which entails the international responsibility of that State.

This basic rule of the law on State responsibility was, for example, set out in 1928 by the Permanent Court of International Justice (PCIJ) in a landmark case concerning a dispute between Germany and Poland over ownership of a factory.[44] The Court noted that a State in breach owes to the affected State a duty of reparation, which must "as far as possible, wipe out the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed".

The law of State responsibility has recently been codified by the International Law Commission (ILC), drawing together existing law. The ILC's draft[45] provides that once a breach has been established, the offending State must cease the act and make "full reparation" for injury caused, including for "any damage, whether material or moral". Full reparation "shall take the form of restitution, compensation and satisfaction, either singly or in combination"[46].

C INTERNATIONAL LAW PRINCIPLES REMAIN APPLICABLE TO CLIMATE CHANGE DAMAGE

Some have questioned whether legal duties under the no-harm rule and rules of State responsibility can still exist alongside the climate regime, or whether, by specifying behaviour required of States, the Convention and Protocol have displaced customary international law rules with respect to climate change damage (the *lex specialis* doctrine).

The *lex specialis* doctrine is essentially a rule of conflict.[47] However, there is no conflict between the climate regime and the no-harm rule. The climate change regime has as its objective the stabilisation of GHG concentrations in the atmosphere in order to protect the global climate system. It is not a regime specifically negotiated to address damage to specific States resulting from the impacts of climate change. Even if the stabilisation of GHGs in the atmosphere is achieved, it is clear that some countries will suffer the adverse impacts from climate change.

An argument that a State could no longer rely on the no-harm rule after becoming a Party to the climate treaties would require compelling support, as it would amount to an implicit loss of rights by operation of law. Yet neither the scope of the climate treaties, nor the negotiation history[48], nor Parties' intent supports a replacement or waiver of the rules of customary international law.[49] The replacement or waiver of an international law rule, which grants rights to individual countries, cannot be done in silence. Hence the rules of customary international law remain applicable to loss and damage from the impacts of climate change.[50]

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[44] Chorzow Factory, PCIJ Ser. A, No. 13, 46-48.

[45] "Draft Articles on State Responsibility for Internationally Wrongful Acts Responsibility of States for Internationally Wrongful Acts", Article 1, adopted by the ILC at its fifty-third session in 2001 and submitted to the General Assembly as a part of the Commission's report covering the work of that session. The Draft articles, with commentaries, are here: http://untreaty.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf

[46] Id., Article 34.

[47] See the analysis of the maxim of lex specialis by Koskenniemi in the context of the ILC's project on 'Fragmentation of Law', available online at http://untreaty.un.org/ilc/sessions/55/fragmentation_outline.pdf

[48] For a comprehensive analysis of the negotiation history, see Verheyen, pp. 43 ff.

[49] To underpin this, on signature of the UNFCCC, five states formally declared (in almost identical terms) their understanding that signature and/or ratification of the Convention "shall in no way constitute a renunciation of any rights under international law concerning state responsibility for the adverse effects of climate change, and that no provision in the Convention can be interpreted as derogating from the principles of general international law." Fiji, Kiribati, Nauru, Papua New Guinea and Tuvalu. See 'United Nations Framework Convention On Climate Change Status Of Ratification', at 8 and 9: http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_conv_rat.pdf . Similar declarations were made upon ratification of the Kyoto Protocol by the Cook Islands, Kiribati, Nauru and Niue. See 'Kyoto Protocol Status Of Ratification', at 9 and 10: http://unfccc.int/files/kyoto_protocol/status_of_ratification/application/pdf/kp_ratification.pdf

[50] This is also the view taken by Faure/Noellkaemper, International Liability as an Instrument to Prevent and Compensate for Climate Change, Stanford International Law Journal, June 2007, 123 at 153.

3 The no-harm rule and its breach in the context of climate change

In an international legal forum, assessment of compliance with the no-harm rule would be conducted on a State-by-State basis, balancing the duties and interests of the 'damaging' and 'damaged' States.[51] Rather than considering a specific country's circumstances, the sections that follow consider breach of the rule by developed country States generally.[52]

As set out in Chapter 2, there are three key criteria for determining compliance with the no-harm rule's standard of care, sometimes referred to as 'due diligence':
1) an opportunity to act;
2) foreseeability of harm; and
3) proportionality of measures taken to prevent harm or minimise risk.

In considering the applicability of these criteria to climate change damage, and informed by the international law principles of common but differentiated responsibilities and respective capabilities, and equity, *it would appear that many developed country States have failed to take proportionate measures to prevent damage to other States resulting from domestic GHG emissions which they knew, or should have known, contributed to the risk of transboundary damage*.

It appears that many developed countries:
(i) Have had an opportunity to act to reduce the risk of transboundary pollution by reducing their emissions of GHGs.
(ii) Have known of the effect of increasing atmospheric concentration of CO_2 on the Earth's heat balance and the consequent risk of damage (at least since 1990, and long before for many major emitters).
(iii) Have failed to take proportionate measures to reduce their excess emissions.

This chapter addresses the factual basis for these propositions in turn.

A THE OPPORTUNITY TO ACT HAS LONG EXISTED

A State can only fail to exercise due diligence with respect to a specific prevention duty if it does not act where it otherwise could have. In the framework of climate change damage, almost every State has had the opportunity to take measures to prevent damage or to minimise the risk of damage. Each tonne of a GHG not emitted, and every carbon sink preserved in the long term reduces the risk of further damage.

A question often raised in the context of climate change – which presents a challenge of accumulation and multiple contribution – is whether reduction efforts by one State would have *effectively* reduced the risk or prevented harm. However, the no-harm rule does not require a State to guarantee that a certain degree of harm will be prevented. This is inherent in the concept of risk minimisation. Due diligence is an obligation to "*make every effort*".[53] This is particularly important with respect to cumulative GHG pollution.

[51] Legal analyses of potential claims for climate damage by and/or against specified States on the basis of the no-harm rule have been undertaken in a number of fictional case studies, and in academic papers. See, for example: Verheyen, Climate Change Damage in International Law, 2005, pp 279 ff; Larson, C.: Racing the rising tide: Legal Options for the Marshall Islands, 21 Michigan J. Int'l L. (2000) 495. See also Jaitly, A./Khanna, N.: Liability for climate change: Who pays, how much and why? 1 RECIEL (1992) 453.

[52] In principle, the same exercise could be done for developing country States, as the no-harm rule is applicable to every State. However, the argument that any developing country State has already breached its standard of care would be, at least for now, untenable. This might change in future.

[53] Pisillo-Mazzeschi, The Due Diligence Rule and the Nature of the International Responsibility of States, 35 German Yearbook of International Law (1992) 9 at 48.

B STATES SHOULD HAVE FORESEEN DAMAGE

The capacity to foresee that a behaviour would lead to harm is a central objective prerequisite of the standard of care.[54] In international law, this is clearly determined on the basis of whether a particular State 'should have known'.[55] Foreseeability does not require a State to foresee all the details of the damage. Instead, as emphasised by the ICJ in *Corfu Channel*, it is sufficient that a State is able to envision the general consequences of an act or omission.

The possibility of man-made interference with the climate system was first shown in 1827 by *Jean Baptiste Fourier* and subsequently by the Swedish scientist *Svante Arrhenius*. Later literature contains ample evidence of foreseeability of damage from this interference. For example, in 1938 one author wrote:

> "As man is now changing the composition of the atmosphere at a rate which must be very exceptional on the geological time scale, it is natural to seek for the probable effects of such a change. From the best laboratory observations it appears that the principal result of increasing atmospheric carbon dioxide…would be a gradual increase in the mean temperature of the colder regions of the Earth."[56]

In 1957 the *Christian Science Monitor* wrote:

> "Every time you start a car, light a fire, or turn on a furnace you are joining the greatest weather 'experiment' men have ever launched. You are adding your bit to the tons of carbon dioxide sent constantly into the air as coal, oil, and wood are burned at unprecedented rates. Collecting in the atmosphere, warming the Earth, and influencing massive currents deep within the sea, this gas could in time substantially change the Earth's climate.'[57]

By the time official US and UK scientists discussed climate change in 1970[58], some 73% of carbon dioxide emissions from fossil fuel and cement production – over 6,700 million tonnes – had been produced by the US, Russia and Germany[59]. By the time of the 1972 Stockholm Conference, it was recognised that the increased concentration of GHGs in the atmosphere "means that, at present rates of use, the Earth's temperature could rise by 0.5°C by the year 2000"[60].

Despite the clear findings of successive IPCC Assessments from 1990 onward,[61] these and other countries continued to increase their emissions. In 1990, the IPCC stated that it was "certain" that "emissions resulting from human activities are substantially increasing the atmospheric concentration" of CO_2, methane, chlorofluorocarbons and nitrous oxides, and that

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[54] Foreseeability is also a well known ingredient of domestic liability or tort law, where generally a distinction is made between positive (subjective) knowledge and imputed or objective knowledge ('should have known').

[55] See for example the Corfu Channel (Great Britain v Albania), 1949 ICJ 4 at 22.

[56] Callendar, G.S., 1938: The artificial production of carbon dioxide and its influence on temperature. Q. J. R. Meteorol. Soc., 64, 223–237.

[57] Robert C. Cowen, Natural Science Editor, The Christian Science Monitor, 4 December 1957.

[58] See UK National Archives, Cabinet Office file ref CAB 163/272 #122885, entitled "Long-term climate changes and their effects": http://www.nationalarchives.gov.uk/catalogue/displaycataloguedetails.asp?CATLN=6&CATID=7689300&j=1

[59] US: 4,277.4; Russia: 1,485.3; Germany: 1,016.4 $MtCO_2$. See http://cait.wri.org.

[60] Only One Earth: The Care and Maintenance of a Small Planet, Ward, B., & Dubos, R. (Penguin, 1972), page 267. Maurice Strong, the Secretary-General of the UN Conference on the Human Environment, commissioned this report in May 1971 to assist that Conference. He intended the report to "represent the knowledge and opinion of the world's leading experts and thinkers about the relationships between man and his natural habitat at a time when human activity is having profound effects upon the environment" (see his letter appointing Dr René Dubos to chair the distinguished group of experts to serve as advisors in preparing the report, cited by the Secretary-General in his Preface to the above report).

[61] See the IPCC AR4's historical overview of climate change science: Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather, 2007: Historical Overview of Climate Change. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, here: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter1.pdf. The American Institute of Physics has set out a chronological sequence of the most important events in the history here: http://www.aip.org/history/climate/timeline.htm

"[t]hese increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface".[62]

The effect of increasing atmospheric concentrations of CO_2 on the Earth's heat balance, and the consequent risk of damage, has thus been positively known by several of the major-emitting States for many decades. No State can argue that the risk was unknown or too remote after 1990. And with the strengthening of climate science over the 17 years spanning the four IPCC Assessment Reports – particularly in respect of human influence on the observed global average temperature increase since the 1950s, of the emission levels needed to stabilise atmospheric concentrations, and of current and future impacts – countries have been made more and more aware of the extent of the risk of damage.

C PROPORTIONATE MEASURES IN THE FACE OF CLIMATE RISK WERE NOT TAKEN

One of the main tasks in establishing a breach of the no-harm rule is determining whether proportionate measures have been taken to avoid damage or minimise the risk thereof. In making this determination, international law considers a State's physical potential to minimise risk and prevent harm, the extent of the State's contribution to the problem, and the State's capacity to take measures. International law does not require a State to take measures destructive to its people and economy, but only "proportionate" measures, i.e. such measures that a State can be reasonably expected to take in the face of a given risk. As the predictability of a risk increases, the obligation to act to prevent damage increases. The determination of proportionate measures involves a weighing exercise, balancing an offending State's sovereignty against the claimant State's integrity.

It would be difficult to argue that it would be "proportionate" for a State to avoid all GHG emissions: not every tonne of a GHG emitted could be prohibited under international law. The human need to survive (including the right to food and housing), and to develop – recognised in several international legal instruments[63] – would clearly be recognised in a court of law, and emissions that can be said to be *necessary* for these purposes would not violate the rule.

The starting point for the analysis of whether a country has taken proportionate measures would be data on historical emissions and/or contributions to warming, and whether changes or trends can be discerned that show the implementation of emission reduction measures. Thereafter, it would be necessary to consider each country's climate policies and evaluate individually whether the measures taken were proportionate based on the knowledge available to that country at a given point in time. This would include the status of implementation of 'no-regrets measures'[64] in a particular country.

Since 1990, developed countries' performance in reducing GHG emissions has differed widely. As a whole, GHG emissions from Annex I countries (excluding economies in transition) increased over the period 1990-2005 by 10% (including LULUCF) or by 11% (excluding LULUCF).[65] Sixteen Annex I counties had increased their emissions, and 24 had decreased their emissions. It would seem that a *prima facie* case could be made that countries without a clear reduction or stabilisation trend have not taken proportionate measures to prevent harm or minimise risks.[66] This would shift the burden of proof and place the onus on a defendant country

[62] IPCC First Assessment Report, 1990, Policymakers Summary, Executive Summary, page xi; Scientific Assessment of Climate change – Report of Working Group I, J.T. Houghton, G.J. Jenkins and J.J. Ephraums (Eds).

[63] See, for example, Article 3 of the Universal Declaration of Human Rights, 1948; and Article 11 of the International Covenant on Economic, Social and Cultural Rights, 1966.

[64] No-regrets (or 'win-win') measures can be implemented at no or very low cost, either because they achieve other aims than climate protection or because they effectively save money through energy savings in the short or medium term.

[65] Annex I countries refers to Annex I of the Convention which includes countries not generally seen as developing countries. However, there is much debate about the composition of the Annexes. Data taken from the UNFCCC website, accessed on 13.10.2008. "LULUCF" means land use, land-use change and forestry.

[66] This is not referring to obligations taken on by Annex 1 countries in Article 4.2 (b) FCCC to reverse trends of GHG by the year 2000. Also, as the no-harm rule applies separately of the FCCC, the possibility of achieving reductions "jointly", possibly even as Annex I group, does not feature in this context.

to show that it has, on the contrary, taken proportionate measures, though these measures might not have yielded the desired effect.

On the other hand, a stable or decreasing emissions trend would not alone be sufficient to indicate that 'proportionate measures' have been taken by the relevant State. For example, emission reductions by a State that have coincidentally resulted from the shut-down of industries (e.g., after the break-up of the former Soviet Union) could not, *per se*, be considered to be the result of that State having taken 'proportionate measures'. Moreover, a stable or decreasing trend still involves emitting GHGs, and thus increasing the risk.

Thus, it would be necessary on a case-by-case basis to determine:

1) whether the given country has considered taking measures in the face of the risk;
2) on what grounds possible GHG emission reduction measures were not taken; and
3) whether past and existing policies constitute effective risk reduction measures, taking into account measures that should not have had an immediately destructive effect on a country's people, including the economy.

For this determination, findings about the implementation of 'no-regrets' measures by individual countries would be relevant, as these show that the size of the emissions contribution from developed countries could have been reduced without substantial macro-economic costs[67].

It would be relatively easy to show individually that many developed countries have not taken these measures in a timely manner, and continue not to do so. Moreover, analysing climate policies of developed countries over time will make it obvious that, in effect, countries ignored any international law that would oblige them to reduce emissions in order to reduce harm to other countries.[68] Rather, most countries opted to wait – seemingly for more evidence of impacts – instead of taking the lead to reduce emissions, even though programmes to reduce emissions in cost-effective ways had often been proposed. The most common explanation for delaying effective measures would be their expected costs – but this would not be a legal defence in the face of increasingly firm evidence that harm would result from unmitigated emissions.

In addition to such evidence, a variety of potentially workable indices and methodologies have been suggested by scientists and policy groups which could assist in determining whether proportionate measures have been taken by a specific State, and thus that no excess emissions were made. Moreover, as we are dealing with a problem of accumulation and multiple contribution, the application of such indices would also help to determine to what extent a country might be responsible for a certain damage. These would serve to establish a baseline of 'allowable' emissions, with all other emissions being in excess of what the no-harm rule allows. Applied to all possible defendants, these indices or methods can suggest to what extent one country is responsible compared to another.

Three types of indices or methods can be identified:

[67] For example, the IPCC stated in 1995: "significant net reductions in net greenhouse gas emissions are technically possible and can be economically feasible… The degree to which technical potential and cost-effectiveness are realized is dependent on initiatives to counter lack of information and overcome cultural, institutional, legal, financial and economic barriers that can hinder diffusion of technology or behavioural changes." And "[n]umerous studies have indicated that 10-30% energy-efficiency gains above present levels are feasible at little or no net cost in many parts of the world through technical conservation measures and improved management practices over the next 2 to 3 decades. Using technologies that presently yield the highest output of energy services for a given input of energy, efficiency gains of 50-60% would be technically feasible in many countries over the same time period….": Climate Change 1995 – Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses. Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change. Editors R.T. Watson, M.C. Zinyowera, and R.H. Moss, at 12 and 13 respectively.

[68] A detailed analysis by country has been done for the USA (Verheyen, pp.280 ff.) and for Canada. See Legal Opinion on whether Canada is currently in violation of, or is likely to violate, its obligations under the United Nations Framework Convention on Climate Change and/or the Kyoto Protocol, Friends of the Earth Canada, 30 October 2006.

1. **An index based on per capita emissions.** This type of simple index would class a State's emissions above an international average baseline of per capita emissions as 'excess' emissions.
2. **An index based on a combination of objective criteria.** This type of index would establish a baseline using a number of (weighted) objective criteria, such as absolute emissions, per capita emissions, per capita GDP and the Human Development Index, and so enable some reflection of national circumstances and capability to reduce emissions.
3. **The Global Development Rights approach.** This specific approach is similar to the approach in item 2 above, but uses first a set level of income baseline below which people are not expected to share the costs of the climate transition – a level that is beyond basic needs but well short of 'affluent' consumption,[69] or criteria to capture subsistence needs.[70]

Per capita emissions (item 1 above) can be determined, for a given year and at least for CO_2, with relative certainty for longer time periods in the past. Determining all emissions above the world per capita average to be 'excess' would be an easy measure of responsibility. Yet, this exercise would not fully weigh countries' capacity and special circumstances.

More comprehensive indices using several objective indicators[71], (such as mentioned in items 2 and 3 above), along with a 'subsistence' baseline, would reflect an effort to achieve fairness, given national circumstances. These indices, such as presented by Oxfam[72] and others, have been designed to determine responsibility to act (i.e. has a country emitted in excess of what it was reasonably entitled to?) or to determine levels of payouts for adaptation (such as the Oxfam Adaptation Index). Their combined recognition of historical and current emission levels, and human survival and development needs, reflect the international law principles of common but differentiated responsibilities and of equity.[73] Hence they offer assistance in determining whether proportionate measures have been taken, and, if so, whether excess emissions have been avoided.

The application of such indices will show that most Annex I countries have generated GHG emissions far in excess of what has been necessary to sustain their people and economies.

D CAUSATION CAN BE LEGALLY ESTABLISHED AT THE STATE LEVEL

The IPCC has projected with high certainty the types of impacts likely to flow from climate change in Africa, Asia, Latin America, and small islands (see Chapter 1). But how might an individual developing country prove that it has suffered, or will suffer, harm as a result of GHG emissions emitted by a particular State or States?

Application of the no-harm rule would require legal assessment of the scientific evidence and causes of climate change within a given 'damaged' State or States. Legally-sufficient evidence of the causes of global warming is in place. Current and future changes in such States[74] that are consistent with the global detection and attribution evidence[75] can be said to create at least *prima facie* evidence that those State-level changes have been and will be caused in part by GHG emissions, and the precautionary principle can be applied to reverse the burden of proof. As Judge Wolfrum stated in his separate opinion in *The MOX Plant Case*:

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[69] This has been expressed by EcoEquity through its Global Development Rights proposal: The right to development in a climate constrained world – The Greenhouse Development Rights framework, Second Edition Executive Summary, September 2008, www.ecoequity.org

[70] This is also an idea proposed by Müller et.al., Differentiating (Historic) Responsibilities for Climate Change, unpublished, (2007) who propose the measure of "Subsistence Allowances".

[71] For a variety of indicators, see for example http://cait.wri.org produced by the World Resources Institute:

[72] Oxfam, note 23 above.

[73] They would also inform the proportionality assessment.

[74] Including local or regional temperature changes where these contribute to the impacts.

[75] 'Detection' refers to the process of demonstrating that climate has changed in some defined statistical sense, without providing a reason for that change; 'attribution' refers to the process of establishing the most likely causes for the detected change with some defined level of confidence. See IPCC AR4, WGI, Chapter 9.1.2 and the Glossary.

> "There is no general agreement as to the consequences which flow from the implementation of this principle other than the fact that the burden of proof concerning the possible impact of a given activity is reversed. A State interested in undertaking or continuing a particular activity has to prove that such activities will not result in any harm, rather than the other side having to prove that it will result in harm." [76]

Moreover, the IPCC already considers it likely that there has been a substantial anthropogenic contribution to surface temperature increases averaged over each continent (except Antarctica) since the middle of the 20th century; and statistically significant regional warming trends over the last 30 and 50 years are found in many regions of the globe[77]. Further scientific support for impacted States would also be found in 'joint attribution', which involves attribution of significant changes in a natural or managed system to regional temperature changes, and attribution of a significant fraction of the regional temperature change to human activities[78]. More such studies could be undertaken, with sufficiently certain results.

A State suffering impacts as a result of temperature increases, now or in the future, would not have major difficulty in demonstrating, as a matter of law, that GHG emissions from developed countries have significantly contributed to those impacts. Similarly, a State arguing that it faces increasing risk from extreme weather events would be able to support such a claim in an appropriate tribunal, in seeking assistance from a respondent State or States for the protection of its assets.

The state of California has already taken legal action for compensation for its losses (including adaptation costs) against some private companies.[79] This illustrates that itemising and substantiating a given State's losses due to human-induced climate change would be possible.

E APPORTIONING RESPONSIBILITY FOR CLIMATE CHANGE DAMAGE

It could be argued that any country that has been found to have infringed the no-harm rule should be held responsible for the entirety of the damage in question, with the burden then on that country to seek contributions towards damages payable from other countries that have also infringed the rule. It could also be argued that where multiple polluters are involved, or in situations of cumulative causation, each actor should only be held responsible for its 'share' of the wrong. Regardless of the theory advanced, or the defence asserted, it is clear that successful cases could be brought.

With regard to determining a share of responsibility, several options would be legally feasible. These include: a country's relative contribution to absolute tonnes of GHG emitted globally; a country's share of 'excess emissions', i.e. only those emissions emitted unlawfully; or a country's contribution to warming.

The third approach was followed by the MATCH group, a group of researchers which, in 2000, conducted a scientific assessment of the relative contributions that different regions and nations had made to the increase of global temperature through their emissions of carbon dioxide, methane and nitrous oxide since 1890[80]. The results of this study show that the US, OECD Europe, Japan, Canada and Oceania had made a combined 41% contribution to this warming.

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[76] Ireland v. United Kingdom, International Tribunal for the Law of the Sea, Provisional Measures, 2001.

[77] See IPCC AR4 WGII, Chapter 1.4.2.1.

[78] Id. , Chapter 1.4.2.

[79] See the full complaint at http://ag.ca.gov/globalwarming/litigation.php , the site of the Attorney General of the State of California ("auto complaint").

[80] Summary report of the ad hoc group for the modelling and assessment of contributions to climate change (MATCH), 7 November 2007, page 1. See http://www.match-info.net/data/MATCH%20summary%20report.pdf.

Similar methods, reflecting the options above, could be applied on a case-by-case basis to support cases against individual countries, based on infringement of the no-harm rule.

F OVER TIME, DEVELOPING COUNTRIES MAY ALSO BREACH THE NO-HARM RULE

The no-harm rule is applicable to all States, regardless of their stage of development. As a result, it is conceivable that in the future developing countries may also breach the no-harm rule. Within the standard of care, however, there will be large differences. Many current non-Annex I countries cannot be expected to undertake substantial emission reduction measures, given their specific circumstances. However, as the indices mentioned above show, there are some countries, such as China, that – given their economic potential as well as GHG intensity – might commit breaches of the no-harm rule. Given that the standard of care is not contingent on historical behaviour alone, but on the real risk of harm inflicted on others, there is no general defence to a failure to take proportionate measures – which would have to be assessed, of course, in each individual case.

G LEGAL CONSEQUENCES

Avoidable and unavoidable climate change damage fall within the ambit of legal consequences of a breach of the no-harm rule. A State found in breach of the rule would, as a priority, have to act to prevent further damage. This might include, for example, financing adaptation measures to avoid further loss and damage. Where measures are not taken swiftly or efficiently enough, compensation is due for damage that would have been avoided through adaptation, but which occurred as a result of, for example, a lack of financing. Compensation would be the only possible redress for unavoidable damage such as loss due to sea level rise.

4 Compensation: Precedents in international law

The international community has established regimes to prevent transboundary pollution and then followed and supplemented these with treaties to address liability and compensation where pollution damage nevertheless occurs. Regimes have also been established to protect a global commons (the high seas, the atmosphere, biodiversity) or other environmental spheres, and similarly supplemented[81]. Though not adopted, of particular interest is the 1991 'AOSIS Insurance Proposal', the only proposal with regard to compensation for climate change damage that has yet been tabled, which will also be described in section C, below.

A MANY PRECEDENTS EXIST FOR LIABILITY AND COMPENSATION SCHEMES FOR TRANSBOUNDARY POLLUTION

Many treaties regulate activities that create a risk of transboundary pollution, or regulate the safe handling of pollutants, and then create mechanisms for compensating for pollution damage.[82] The most prominent of these regimes cover risks from nuclear damage, oil spills, transportation of dangerous and hazardous goods, and the pollution of watercourses through industrial accidents. These international law frameworks have been created to respond to the common challenge of loss and damage from environmental pollution in situations involving:

- massive pollution with expensive transboundary impacts;
- numerous victims;
- absence of readily-identifiable and/or legally-responsible parties;
- absence of a ready and adequate source of compensation; and
- absence of a harmonised system for addressing claims.

In the absence of a binding treaty, affected States and private citizens would bear the costs of dangerous (industrial) activity. Ensuring prompt and adequate compensation for private and public victims of transboundary pollution is thus a central goal of 'liability and compensation' regimes.

There are clear similarities in respect of climate change. There are also differences – for instance, most of the existing regimes address pollution 'accidents', rather than cumulative pollution.

Examples of liability and compensation Conventions include the following:

- ***Space objects.*** The 1972 Convention on International Liability for Damage Caused by Space Objects: Any State that launches a space object is strictly liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight. Liability is not limited.
- ***Oil spills.*** The 1992 Civil Liability Convention (CLC 92) and the 1992 Fund Convention address risks and damage relating to oil spills from marine transport. On the basis of the CLC 92, shipowners are liable for pollution damage resulting from an oil spill. Liability is limited, and shipowners are required to have in place insurance to cover damage up to the agreed limit of liability. Liability limits increase with vessel weight, tying greater liability to vessels that pose a risk of greater damage from larger spills. The Fund Convention compensates oil spill victims when the limits of liability under the CLC 92 are insufficient to

[81] For greater detail on these treaties, and their relevance in the climate change context, see Linneroth-Bayer/Mace./Verheyen, Insurance-Related Actions and Risk Assessment in the Context of the UNFCCC, Background Paper, May 2003, www.unfccc.int (commissioned by the UNFCCC Secretariat for back-to-back UNFCCC workshops on risk assessment and insurance in 2003).

[82] See the 1969 International Convention on Civil Liability for Oil Pollution Damage and the 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention), which have now been supplanted by the 1992 Civil Liability Convention (CLC 92) and the 1992 Fund Convention.; the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention), the Nuclear Liability Conventions, 1960 Paris Convention, as amended by the 1963 Brussels Supplementary Convention, and the 1963 Vienna Convention, and the 1988 Joint Protocol.

compensate all damage. The Fund Convention uses levies on buyers of crude oil and heavy fuel oil to constitute an International Oil Pollution Compensation Fund (IOPC Fund 1992). The Fund is an international organisation, established to administer the compensation regime. If claims exceed the owner's fixed limit of liability under the CLC Convention, remaining claims may be made against the International Oil Pollution Compensation Fund. If the limit of that fund is exceeded, a further layer of compensation is available under the International Oil Pollution Compensation Supplementary Fund.

- ***Nuclear damage.*** The nuclear damage Conventions[83] address risks arising from the peaceful use of nuclear energy. These Conventions recognise the potentially limitless damage from nuclear incidents by limiting owner liability, and distributing responsibility for compensation beyond owners to different groups of stakeholders. A first tier of compensation comes from an operator's compulsory financial security. A second tier comes from public funds of the State in whose territory the nuclear installation is sited, up to an agreed limit. A third tier is made available by all contracting Parties up to another agreed limit. At this level, all State Parties collectively make contributions based on their installed nuclear capacity and the UN rate of assessment. Under the Brussels Supplementary Convention, half the contribution is based on the ratio between the gross national product (GNP) of each Party and the total of the GNPs of all Parties, and the other half based on the ratio between the thermal power of the reactors situated in each Party and the total thermal power of reactors sited in all Parties.[84]
- ***International watercourses.*** The Watercourses and Industrial Accidents Protocol[85] provides that operators of industrial installations are strictly liable for damage caused by their activities on international watercourses. Operators have to establish financial security, such as insurance or other guarantees, to provide cover for potential losses from industrial accidents. In exchange, operator liability is limited to a fixed amount.
- ***Hazardous substances.*** The Hazardous and Noxious Substances (HNS) Convention[86] is similar in structure to the CLC 92 and Fund Conventions. When an incident occurs for which compensation is payable under the HNS Convention, compensation is first sought from the shipowner. Once the shipowner's limit of liability is reached, additional compensation is paid from the HNS Fund. Contributions to the HNS Fund are levied on persons or entities in the Contracting States who receive a certain minimum quantity of HNS cargo during a calendar year.
- ***Environmental damage.*** The Lugano Convention[87] is a regional treaty adopted under the auspices of the Council of Europe that addresses liability and redress for environmental damage, regardless of whether it has a transboundary dimension. The Convention covers 'dangerous activities', which include the production, use, disposal or release of genetically modified organisms, the operation of an installation for the disposal and treatment of wastes, and other activities. An activity is deemed dangerous if it poses "a significant risk for man, the environment or property". States must ensure that operators within their territory either participate in a financial security scheme or maintain a financial guarantee sufficient to cover their liability, up to the established limits of that liability.

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[83] The OECD's 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy, as amended by the 1963 Brussels Supplementary Convention, and the IAEA's 1963 Vienna Convention on Civil Liability for Nuclear Damage, which are linked by a 1988 Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention. In 1997, over 80 States adopted a Protocol to Amend the 1963 Vienna Convention and also a 1997 Convention on Supplementary Compensation for Nuclear Damage. A 2004 Protocol to amend the Paris Convention and a 2004 Protocol to Amend the Brussels Supplementary Convention have also been adopted.

[84] 1963 Brussels Supplementary Convention. The 2004 Protocol to Amend the Brussels Supplementary Convention will use a new method of calculation when it enters into force, based 35% on GDP and 65% on installed nuclear capacity "reflecting the sense of responsibility which BSC states place on nuclear power generating states". www.nea.fr/html/law/brussels-supplementary-convention-protocol.html1997. The 1997 Convention on Supplementary Compensation for Nuclear Damage, which also has not yet entered into force, also bases contributions on installed capacity and the UN rate of assessment.

[85] 2003 Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters.

[86] 1996 International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances.

[87] 1993 Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment.

B LEARNING FROM THESE EXAMPLES

The above Conventions offer just a few examples of the numerous contexts in which the international community has come together through a legally-binding treaty to address the consequences of activities that are of commercial value but that put the environment and communities at risk. The design of each system reflects the various interests involved, and recognises that different groups derive different benefits from the underlying commercial activity that gives rise to the risk of environmental damage.

For example, many interests benefit from the transportation and use of oil and nuclear energy. These include State interests, commercial interests and, at the end of the chain, and individual interests in ensuring that regulated substances are handled in a safe manner. To reflect and balance these interests, liability schemes have been established. A similar approach might be paralleled in the context of climate change damage, where there are many competing interests, where risks are increasingly known, and where emissions cannot be cut rapidly enough, nor adaptation measures put in place fast enough, to avoid damage. The negotiation of an appropriate compensation and liability scheme to address GHG emissions could assist in managing relations between States – avoiding what will inevitably become challenging and divisive claims between countries and stakeholders for compensation as a result of damage from the impacts of climate change.

The oil pollution regime, and many other liability and compensation regimes, also demonstrate how international law has embraced mandatory insurance tools to manage financial risk arising from potential transboundary effects of pollution damage. These tools can be used to cover certain risks effectively, and assist potential polluters in internalising the cost of pollution. These examples also illustrate that the types of damage and loss compensated under international law can be broad and include ecological damage as well as loss of income.

The establishment and evolution of the IOPC Fund and Supplementary Fund, which were created to address damage that could not be compensated under the CLC, are illustrations of situations in which States have moved toward ensuring that victims of oil pollution damage will be fully compensated for their losses, and that the payment of claims will not have to be forgone because limited funds are available.

Also interesting in the climate change context is the approach of the nuclear conventions, in which State funds effectively cover damage, with contributions linked to 'responsibility' (installed capacity) and 'capability' (UN scales of assessment). This approach was taken up in the drafting of the 'AOSIS Proposal'.

C THE 1991 'AOSIS INSURANCE PROPOSAL': A PROPOSED COMPENSATION SCHEME

In connection with the negotiation of the UNFCCC in 1991, the Alliance of Small Island States (AOSIS) proposed the establishment of an International Climate Fund, to counter the adverse consequences of climate change, and a separate International Insurance Pool to provide financial insurance against the consequences of sea level rise.[88] Revenue was to be drawn from mandatory sources, and in particular from developed countries.

The 'AOSIS Proposal' recognised that a number of questions would need to be considered to form an insurance pool: methods of funding; classification of types of loss to be covered; criteria for entitlement to claim against the Pool; methods of evaluating loss resulting from sea level rise; and limitations on the amount of compensation payable by the Pool. The proposal presented a formula for contributions, based on the 1963 Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy, with contributions based:

[88] See further on the history of this proposal: Verheyen, p. 50 ff. and Yamin/Depledge, The International Climate Change Regime Guide, 213 ff.

(a) 50% on the basis of the ratio between the ***Gross National Product*** of each developed country party and the total GNP of all developed countries; and
(b) 50% on the basis of the ratio between the ***total emissions of CO_2*** of each developed country party and the total CO_2 emissions of all developed countries in the year prior to the contribution year.

In this way, contributions would be based in part on the relative capacity to pay (GNP relative to other contributing countries) and relative responsibility (share of emissions relative to other contributing countries).

D WHY A NEGOTIATED TREATY IS NEEDED TO ADDRESS CLIMATE CHANGE DAMAGE

Why do Parties ratify liability and compensation schemes? Attaching clear liability and responsibility to the transboundary consequences of environmental pollution helps to enforce regulatory regimes established to protect the environment. Participation in liability and compensation regimes reduces uncertainty for States which might otherwise have to cover loss and damage caused by their citizens and incurred by citizens of other States when adequate compensation cannot be obtained from the responsible parties. These regimes also reduce uncertainty for potential victims, by ensuring the availability of a certain minimum level of compensation, and elaborating procedures for making claims. Finally, these regimes reduce risk for those investing in business operations that engage in activities associated with risk, by defining limits of liability.

As the preceding chapters show, there is a sound legal basis under customary international law rules for individual cases brought by States seeking compensation for damage and loss resulting from the impacts of climate change. Nevertheless, each individual case would meet with a number of challenges, among them the apportionment of responsibility between the various countries that have acted in breach of the no-harm rule. They would also be likely to require specially-commissioned scientific investigation with attendant costs, for example in relation to causation and damage assessment. These cases could proceed in an appropriate forum, with good prospects of success, adding to the potential liability and litigation risk uncertainty that already exists with respect to private claims and possible tort actions.

Such individual cases should not, however, be the path of choice. International law is based on the notion of cooperation and the avoidance of adjudication – where possible – in favour of diplomatic solutions. Cumbersome individual cases should not be necessary, given that the climate regime is based on the notion of cooperation and good faith[89]. The view has been expressed by international law scholars that States even have a *legal duty* to provide negotiated solutions where environmental damage is expected to occur, so that prompt and adequate compensation can be obtained in practice.[90] This is a view supported by the International Law Institute and others.[91]

Although the issues of who pays what, to whom, and when, will be challenging to resolve, and ratification of such an instrument could face substantial domestic hurdles, a negotiated treaty to address the unavoided and unavoidable loss and damage is likely to be the only appropriate and practical solution to addressing climate change damage. The 'AOSIS Proposal' of 1991 provides a glimpse of what could be conceivable – not least as it only covers one type of damage. International law principles and precedent provide support for the negotiation of a compensation instrument, as a necessary and appropriate response to this regulatory gap. The current negotiations leave room to begin this discussion.

[89] Expressed for example in paragraph 6 of the preamble, and Articles 4(2)(d), 7(2)(e), and 17 of the Convention.
[90] See e.g., Lefeber, R., Transboundary Environmental Interference and the Origin of State Liability, pp. 230 ff (expressing the view that there is a duty under international law to offer victims of significant transboundary harm prompt, adequate and effective compensation. This duty can be discharged either by establishing special civil liability regimes or by compensation schemes funded by states. For further discussion see Verheyen, 330 ff.
[91] Rao (ILC Special Rapporteur) has stated that "States have a duty to ensure that some kind of arrangement exists to guarantee equitable allocation of loss", 1st Report of the Special Rapporteur of the ILC (Rao) on the legal regime for the allocation of loss in case of transboundary harm arising out of hazardous activities, A/CN.4/531 at 50.

5 Elements of a compensation and liability regime for climate change damage

States have agreed to increase their efforts to develop further international law concerning liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control[92].

The sections that follow identify the key elements that would have to be addressed by a liability and compensation regime for climate change damage, and raise key principles for consideration in selecting among different design options.

To fashion a liability and compensation scheme for the impacts of human-induced climate change, a number of decisions on design options would have to be made. Each has its own political, economic, practical and legal implications.

A WHO SHOULD PAY?

One of the most challenging issues to consider in developing a liability and compensation mechanism in the climate change context is the appropriate treatment of historical, present and future emissions. Most of the increase in concentrations of GHGs in the atmosphere since the 1700s has resulted from Annex I Party emissions, and it is these past emissions that are now causing present injury. However, developing country emissions are now on the increase. These emissions will contribute to future injury, as well as to tipping points for the climate system. Who should pay to redress the impacts of climate change?

Options include:

- Annex II countries (wealthy subset of developed country Parties);
- Annex I countries (developed country Parties);
- all countries with 'excess emissions'[93];
- all countries.

In choosing among these options, important principles to consider include: the polluter pays principle; the principle of common but differentiated responsibilities and respective capabilities; the principles of equity and inter-generational equity; the principle that developed country Parties should take the lead in addressing climate change and its adverse effects; the precautionary principle – that Parties should take measures to anticipate, prevent or minimise the causes of climate change and its adverse effects; and the need for an adequate flow of funds.

Applying these principles, it is clear that Annex II Parties are first in line to pay compensation.

B WITHIN RESPONSIBLE STATES, WHO SHOULD PAY?

Any compensation scheme will have to clearly define whether States will be responsible for paying for climate change impacts, or whether public and private actors within States will share this burden.

Options include:

- State liability
- Civil liability
- A combination of State and civil liability

[92] Rio Declaration, Principle 13 (see Chapter 1, section C above).

[93] As measured, for example, based on a series of criteria that capture responsibility and capability (e.g., overall GHG emissions, per capita GHG emissions, GDP, per capita GDP, Human Development Index etc.) with consideration given to relative contributions to historical emissions. See Chapter 3, section 4(c) above.

State liability leaves responsibility at the national level. Civil liability places responsibility on private and public entities directly engaged in the activities that create a pollution risk – here, the generation of GHG emissions.

In deciding among these options, important principles to consider include: the polluter pays principle; and the principle that policies and measures should be comprehensive and cover all relevant sources and sinks and reservoirs of GHGs, and comprise all economic sectors.

Decisions on the channelling of responsibility might also consider a range of factors, including: the diffuse or concentrated nature of the pollution risk from different actors; the scale of emissions from different actors; the ability of different actors to minimise behaviour that leads to pollution risk; and trade-offs between creating an inclusive system and one that is manageable from an administrative point of view. For example, to capture the bulk of emissions, liability might be channelled to upstream suppliers of oil, coal and natural gas; producers and importers of carbon-intensive products; and/or operators of GHG-intensive operations, such as power plants and transport.

Governments are responsible for regulating many of the activities within their jurisdictions that create a risk of transboundary GHG pollution. They are also frequently generators of pollution as well. Finally, where States wish to give regulated entities a release from liability (for example, where activities are undertaken in compliance with permit conditions), it makes sense to place responsibility for residual risk on States.

Most liability and redress schemes have developed a system of primary civil liability, backstopped by residual State liability. The nuclear regime, for example, places strict liability on the operators of nuclear installations and then limits this liability, so that the financial risk to operators of engaging in the generation of nuclear power is known and therefore insurable. If established limits of liability for operators are exceeded by an event, supplementary schemes provide additional funding, through layer of contributions by installation States and by contributions pooled across State Parties. Similarly, the oil spill regime holds tanker owners strictly liable for damage caused from accidental spills, supplemented by operator pooling arrangements and backstopped by government contributions to ensure that, as much as possible, all damage from the undertaking of risky activities is compensated.

C WHO SHOULD BE ELIGIBLE FOR COMPENSATION?

In fashioning a compensation scheme, it is necessary to determine up front how eligibility for compensation will be determined – *who* will be eligible to bring claims?

Options include:

- Developing country Parties, with priority to particularly vulnerable developing countries suffering the greatest relative impacts.
- Developing country Parties that have contributed the least to GHG emissions (in absolute or relative terms).
- Developing country Parties, with flexibility to accommodate developed country Parties in the future as shifts occur in relative responsibilities for emissions and in relative exposure to impacts.
- All Parties, with eligibility phased in or phased out as developing country emissions grow and Annex I and Annex II Parties begin to suffer the effects of developing country increasing emissions.

In deciding among these design options, key principles might include: the Convention's central principle of common but differentiated responsibilities and respective capabilities; the principles of equity and inter-generational equity; the principle that developed countries should take the lead in combating the adverse effects of climate change; and the principle that full consideration

must be given to the specific needs and special circumstances of developing country Parties and especially those that are particularly vulnerable to the adverse effects of climate change.[94]

To be equitable, the rules established for eligibility for compensation should acknowledge that some countries have done little to contribute to global GHG emissions and hence have a greater claim in equity to compensation for climate change damage than countries that are responsible for greater historical emissions. Any compensation system should also acknowledge that climate change impacts will be more severe in different national contexts and that certain countries, as a result of their particular physical or economic vulnerabilities, will sustain the largest impacts in relative terms.

Applying these principles, eligibility clearly should be given as a priority to particularly vulnerable developing countries suffering the greatest relative impacts and that have contributed the least in terms of historical GHG emissions. Over time, and depending upon available resources, eligibility might be progressively extended to a broader group of countries.[95]

The issue also arises as to how private or community losses within eligible States could be addressed. One option would be to give private entities and individuals a direct right to claim compensation; another option would be to include these losses in State claims. If the latter option were adopted, private persons or entities might seek to recover at the national level. Whatever approach is taken, the guiding principle must be to ensure compensation for those who will suffer 'on the ground'.

D WHAT KINDS OF DAMAGE COULD BE COVERED?

Any compensation scheme will have to clearly identify the types of damage and loss that will be compensable.

Options include:

- Loss of life or personal injury.
- Loss of or damage to property.
- Economic loss (including some losses arising from impairment of the environment).
- Environmental damage.
- Moral damage[96].

Civil liability regimes established through existing international agreements tend to provide for similar heads of damage. These include loss of life or personal injury, property loss and damage, economic loss and environmental damage.[97] The International Law Commission has also identified moral damage as recoverable under principles of international law.[98]

In deciding among options, key principles would include: consistency with international practice; and the selection of categories of compensable damage that will come as close as possible to putting right all the climate change damage suffered by those countries that have been, and will become, victims to such impacts.

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[94] See Convention Article 3 and Convention preamble.

[95] A number of proposals already have been made for universal eligibility, differentiating payouts through a range of criteria. Mexico, for example, has proposed a unitary system, in which all countries contribute to a World Climate Fund, and all countries may draw upon this fund, to differing degrees.

[96] "'Moral' damage includes such items as individual pain and suffering, loss of loved ones or personal affront associated with an intrusion on one's home or private life." International Law Commission, Draft Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries, 2001, Commentary on Article 31 (Reparation), paragraph 5, at 92. See http://untreaty.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf

[97] Mackenzie, Ruth, 'Environmental Damage and GMOs', in ENVIRONMENTAL DAMAGE IN INTERNATIONAL AND COMPARATIVE LAW, Oxford University Press, Chapter 5 at 79-80.

[98] See note 97 above.

Compensation for *environmental damage* has typically been limited to the costs of reasonable measures of reinstatement of the impaired environment, where reinstatement measures are actually taken or are to be taken, and the costs of preventative measures.[99] The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1993 Lugano Convention contain definitions of 'measures of reinstatement' that include measures taken not only to reinstate or restore damaged or destroyed components of the environment, but also to introduce, where reasonable, the equivalent of these components into the environment.[100]

In the climate change context, categories of damage and loss will result from *rapid* onset extreme events, such as cyclones, typhoons, hurricanes and floods as well as from *gradual* changes, such as sea level rise and drought, that result in the loss of land or negatively impact the resource use value of land. Rules for addressing damage may need to differ with respect to these categories of impacts.

International law liability and redress rules typically work to:
1) ensure *restoration* of natural resources to their pre-incident conditions, to address and redress the adverse impacts on the environment and the public;
2) ensure *complementary measures* to be taken off-site by improving or protecting natural resources and/or services at an alternative location where restoration to pre-incident conditions is not possible or practical; and
3) consider c*ompensation* where restoration and complementary measures are not possible.[101]

In the climate change context, restoration may be possible for some impacts, and complementary measures off-site may be possible for others. But much loss will be irreversible and warrant compensation. The calculation of monetary compensation is further complicated where losses are irreversible and increasing.

Under the Convention on Biological Diversity, a Group of Legal and Technical Experts has considered a parallel challenge of *irreversible biodiversity loss*. The Group has found this situation conceptually similar to a situation in which interim loss (the period between damage and reinstatement or complementary measures) continues indefinitely. It has stated: "In theory this could obligate the responsible party to compensate for interim losses indefinitely, and whether monetary compensation – either as a stream of compensation or as a one-off lump sum – might be appropriate is a policy decision that would then be reflected in liability and redress rules."[102]

E WHEN COULD A CLAIM FOR COMPENSATION BE MADE?

To support a claim, impacts would have to be negative or adverse in effect and present over a period of time.[103] Impacts would have to diverge from baseline conditions, hence a decision would have to be taken on what change of circumstances provides support for a claim for compensation.

Options:
- upon actual proof of causation;
- upon the crossing of agreed thresholds relating to agreed parameters, representing significant changes or variations from baseline conditions.

[99] Id., citing as examples the 1996 International Convention on Liability and Compensation for Damage in connection with the Carriage of Hazardous Goods by Sea, Articles 1(6) and 3; 1997 Vienna Convention on Civil Liability for Nuclear Damage, Article 1(k); 1992 International Convention on Civil Liability for Oil Pollution Damage, Article 1(6); 1999 Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wasters and Their Disposal, Article 2(2(c)(d).
[100] Id. at 80.
[101] See the work of the Group of Legal and Technical Experts under the Convention on Biological Diversity in the context of damage to biodiversity, UNEP/CBD/COP/9/20/Add.1 at 9. Liability and redress for damages also includes 'interim losses' suffered between the time when damage occurs until restoration or complementary measures are in place.
[102] Id.
[103] UNEP/CBD/COP/9/20/Add.1 (Liability and Redress in the context of Paragraph 2 of Article 14 of the Convention on Biological Diversity) (20 March 2008) at 4. The determination could look at the character of the impact, the importance or value of the resources lost or forgone.

Key considerations in deciding between these options might include: objectivity, credibility, accuracy, consistency, cost effectiveness, and the principle of common but differentiated responsibilities and respective capabilities.

Given the challenges inherent in evaluating claims for climate change damage, it may not be practical to expect developing countries to provide proof of causation on a case-by-case basis. However, it might be possible to agree up front that certain shifts in parameters represent changes from historical baseline conditions that will be recognised by the process.

For example, certain changes relative to historical averages might be sufficiently or statistically unusual as to warrant consideration in the context of climate change damage (e.g., an agreed percentage increase or decrease in rainfall over historical averages, the occurrence of three category 4 storms in a season that typically sees only one, or sea level rise of a certain extent).

Critical parameters might be identified in a country or regional context, with thresholds proposed at levels that can be expected to result in significant loss or damage, or irreversible impacts (e.g., temperature, precipitation, sea level rise, frequency and/or severity of extreme weather events). When a threshold is crossed or a trigger event occurs, claims for compensation could be made. The choice of such a 'parametric option' would largely be an issue of how much Parties wish to negotiate 'up front' and how much they wish to leave to resolution once a claim has been made.

Options for parameters might include:
- Temperature
- Precipitation
- Sea level rise
- Frequency and/or severity of extreme weather events

In setting the thresholds, historical experience might be used to link projected climatic shifts with their probable physical, economic, social and human impacts (e.g., the probable impacts of temperature increase or excessive rainfall on ecosystems, populations and agricultural productivity, or probable impacts of sea level rise on coastal land area and infrastructure).

Baseline information might include, for example, average number of days of drought over a period of years, average annual or seasonal rainfall over a period of years, or average frequency and intensity of extreme weather events. Implementation of the principle of common but differentiated responsibilities and respective capabilities might entail a degree of flexibility and assistance to developing countries in gathering and establishing baseline data.

Options for setting parameters and thresholds might include:
- proposals by eligible countries suited to their national circumstances, for review;
- recommendations by a Technical Committee for adoption; or
- standard parameters, thresholds or triggers could be negotiated and established for similarly situated countries (e.g., sea level rise for small island developing states, duration of drought or excessive rainfall for agriculture-dependent economies).

Options for setting baselines include:
- baselines presented in national communications or national adaptation planning documents, which could be subjected to a form of technical review; or
- baselines developed by a Working Group/Technical Commission for each eligible Party based on objective historical data.

F HOW COULD AN AMOUNT OF DAMAGE BE DETERMINED?

It will be necessary to decide *how* the amount of loss and damage is to be determined.

Options:
- actual valuation of damage
- estimated loss agreed in advance

Damage could be assessed by actual valuation after damage has occurred, or could be agreed in advance for different types of damage, or a combination of both.

For certain categories of impacts, it may be more practical to determine types of damage and agree in advance amounts of compensation payable if the threshold for a certain parameter is reached.

Changes in parameters could also be used in the context of valuation of loss, with agreed triggers leading to agreed levels of compensation in advance. Past experience, loss estimates and modelling might be used to project the magnitude of physical, economic and ecological damage likely to be associated with different changes in parameters in a country or regional context. Anticipated risk reduction measures might be factored in to these projections.

G HOW MUCH OF THE LOSS SHOULD BE COMPENSATED?

In addition to addressing when a claim for compensation can be made, and damage determined, it is necessary to determine *how much* compensation is to be paid. Not all loss and damage from climate change will be attributable to human-induced climate change.

Options for levels of compensation include:

- all loss and damage could be compensated;
- loss and damage with respect to certain elements could be compensated;
- a fixed share of the loss and damage could be compensated.

These options for the level of compensation would need to be negotiated if sums of compensation were not to be agreed in advance as referred to the second option in section F above. In deciding among options, key considerations might include accuracy and cost-effectiveness.

For reasons of administrative convenience, and in order to avoid the impossibility in many cases of separating out human-induced climate-related impacts from other causative agents, the system might accept that at least some portion of the damage seen when thresholds are reached is due to human-induced climate change. Loss and damage might then be compensated with respect to certain heads of damage, or a fixed share of loss and damage could be compensated.

H HOW MIGHT A COMPENSATION FUND BE CONSTITUTED?

In order to address claims and pay compensation, a source of funding must be established.

Options for constituting a fund might include:

- assessed contributions from Annex II Parties based on a calculated level of 'excess' emissions;
- assessed contributions, based on agreed criteria (e.g., GDP, GHG emissions, human development index, per capita emissions and/or other criteria);
- contributions derived from the auctioning of a specified percentage of Assigned Amount Units (AAUs) at the international level (or the contribution of an equivalent value for non-Annex B Parties);

- an agreed level of contributions from national level auctioning revenues (or the contribution of an equivalent value based on GHG emissions as a proxy for AAUs for non-Kyoto Parties);
- layers of contributions from different stakeholder groups (from States, from private entities);
- national contributions, based on State collections from regulated sectors.

In deciding among options, key principles may include:
- the polluter pays principle;
- the principle of common but differentiated responsibilities and respective capabilities;
- the principle that developed countries are to take the lead in combating the adverse effects of climate change; and
- the principles of equity and inter-generational equity.

In addition, any system should be objective and transparent in its application, and not overly burdensome to administer. Contributions should also create incentives for major emitters (both countries and sub-national entities if possible) to decrease their emissions, and provide a steady and adequate flow of funding to address claims.

The specific application of these principles to the establishment and administration of a compensation fund will depend in part on other design choices. For example, if a State liability system is put in place, contributions may be assigned directly to States. If a civil liability system is agreed, contributions might be collected by States or monitored by States, but come from regulated public or private sector entities. If a combined system is used, with operator liability backstopped by one or more layers of supplementary funding, then mandatory contributions might be drawn from different categories of stakeholders (e.g., upstream producers, downstream consumers, States) using different means.

I WHAT KINDS OF LIMITS MIGHT BE PLACED ON LIABILITY?

For many countries, the benefit of limited liability would provide the incentive to sign and ratify a liability and compensation regime. Limits achieved might be financial limits on liability, or time limits on exposure to liability for specific activities through the creation of limits on the period for bringing claims.

Options for financial limits might include:

- agreed ceilings on liability (e.g., for a timeframe, or category of damages);
- caps relative to GDP (e.g., a percentage of GDP);
- tiered financial limits, based on historical responsibility or capability.

Options for time limits might include:

- limiting claims to damage occurring after a threshold year (e.g., 1970, 1990);
- claims for damage caused by emissions before a threshold year;
- restricting claims to within x years of discovery of damage.

In deciding among options, key principles for consideration include:
- the polluter pays principle;
- the principle of common but differentiated responsibilities and respective capabilities;
- the principles of equity and inter-generational equity; and
- the need to give full consideration to the specific needs and special circumstances of developing country Parties, especially those particularly vulnerable to the adverse effects of climate change.

Limits on liability should be balanced with the need to redress the climate change damage suffered by those affected by climate change wherever possible. In keeping with the principle of common but differentiated responsibilities and respective capabilities, full support should be provided to developing countries in assessing their needs and gathering the necessary data, recognising the limited capabilities of many developing countries in this regard. This should

ensure that limitations on claims needed for insurability and predictability do not work to pre-empt valid claims.

J WHAT INSTITUTIONAL ARRANGEMENTS MIGHT BE NEEDED?

A robust, transparent and credible institutional framework is needed to administer any legally-binding compensation scheme. The specific nature of the institutional framework or frameworks will depend on the body's mandate and role. For example, a body or bodies might be tasked to:

- determine eligibility for compensation;
- identify or verify country vulnerabilities;
- establish or approve thresholds or triggers on a country or regional basis;
- hear claims and award compensation;
- assess and collect contributions;
- manage, maximise and protect funds, including through the use of insurance tools.

Options for an institutional body or bodies include:

- independent body, operating under the guidance of the UNFCCC;
- independent body, created under a new treaty to administer the scheme;
- constituted body under the UNFCCC COP;
- independent body under the United Nations;
- existing inter-governmental organisation;
- new inter-governmental organisation.

Key principles in deciding among options, in order to enhance credibility and legitimacy, might include: independence from influence, transparency, competence, cost-effectiveness and representative governance, and/or appropriate oversight. For each specific role, it would be necessary to decide whether credibility would be enhanced by lodging responsibility under the COP or under an independent institution.

There are many examples of bodies created under other compensation schemes to manage claims. The United Nations Compensation Commission (UNCC) is an example of an independent body established by the United Nations Security Council in 1991 to process claims and pay compensation for losses resulting from Iraq's invasion and occupation of Kuwait.[104] The International Oil Pollution Compensation Fund (IOPC Fund) presents a different model, as an administrative body set up specifically to collect and pool annual levies to meet the anticipated compensation expenses from oil spills for the coming year.[105]

Selection among institutional approaches will depend in large part upon other scheme design options, as discussed above.

[104] The Security Council established Iraq's legal responsibility for such losses in resolution 687 of 3 April 1991, finding that: "Iraq … is liable under international law for any direct loss, damage, including environmental damage and the depletion of natural resources, or injury to foreign Governments, nationals and corporations, as a result of Iraq's unlawful invasion and occupation of Kuwait". The Commission pays compensation to successful claimants from a special fund that receives a percentage of the proceeds from sales of Iraqi oil. In June 2005, the Governing Council of the UNCC approved the last reports and recommendations of the Panels of Commissioners. By that time, awards of approximately US$52.5 billion had been approved in connection with approximately 1.5 million of the over 2.6 million claims received. UNCC at a glance, at http://www2.unog.ch/uncc/ataglance.htm

[105] Contributions are levied on any person who has received in one year more than 150,000 tons of crude oil and heavy fuel oil in a State Party to the Convention. States are not responsible for these payments unless they have accepted responsibility on behalf of their oil receivers, or unless they themselves receive oil in excess of reportable amounts. Contracting States are required to report the names of persons liable to contribute, and the quantity of oil each has received. States are required to certify reports from its shipping companies.

K HOW MIGHT INCENTIVES BE PROVIDED FOR THE REDUCTION OF RISK AND LOSS?

As already discussed, all Parties to the Convention are required to implement measures to facilitate adequate adaptation to climate change, as well as to cooperate in that endeavour (Art. 4.1 a) and e)). In this context, this reflects the duty under international law to minimise loss under the rules of State responsibility.

A well-designed compensation and liability scheme should create incentives and mechanisms to encourage compliance and minimise loss and damage. Should risk reduction measures be required before countries can access compensation?

Options include:

- additional requirements to reduce risk and loss;
- no additional requirements to reduce risk and loss.

Risk reduction requirements might include, for example, a requirement that adaptation planning measures be in place or put in place, that investments in adaptation planning and/or measures have been made or are made, that urgent and immediate needs have been identified through NAPAs or other adaptation planning documents, or that certain risk reduction measures have been implemented or will be implemented.

In considering these options, key principles include:

- commitments by developed country Parties under Convention Articles 4.3, 4.4 and 4.5 to provide and facilitate financial and technical support for developing country adaptation efforts;
- the recognition under Convention Article 4.7 that the extent to which developing countries will meet their commitments depends upon the extent to which developed countries comply with their obligations on financing and technology transfer; and
- the need to consider the special needs and concerns of developing countries, and especially particularly vulnerable developing countries, in the areas of funding, technology and insurance.

Hence any additional requirements for accessing compensation should be matched with sufficient financial and technical support to undertake the required risk reduction measures.

The above list of issues to be considered and resolved in framing is by no means exhaustive. It is clear that the negotiation of a liability and compensation scheme to address climate change damage presents substantial challenges. These technical issues are, however, capable of resolution.

L CONCLUSION

Given the enormous scale of the impacts foreseen from GHG pollution, the particular vulnerability of many developing countries to these impacts, and advances in attribution science, the likelihood of legal action against major-emitting countries is increasing. The international community can no longer ignore the serious and irreversible damage that has already been done and will be done to many developing countries through the GHG emissions of other countries.

Further discussion on the possible elements of a compensation and liability regime for climate change damage is a necessary step in moving the climate change regime forward. The Bali Road Map offers the opportunity to begin this discussion in the context of the post-2012 negotiations. It is hoped that this discussion paper, and future work, will contribute to the development of a fair and appropriate regime to address climate damage – one of the most glaring injustices of our time.

WWF-UK
Discussion paper

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The mission of WWF is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by
- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
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