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Non-economic loss and damage in the context of climate change: understanding the challenges

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Discussion Paper

3/2016

Non-Economic Loss and Damage in the Context of Climate Change

Understanding the Challenges

*Olivia Serdeczny
Eleanor Waters
Sander Chan*

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NELD

Non-Economic Loss and Damage
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Abstract

The concept of non-economic loss and damage (NELD) captures the impacts of climate change that are hard to quantify and often go unnoticed by the outside world, such as the loss of traditional ways of living, cultural heritage and biodiversity. It also encapsulates losses whose valuation raises ethical concerns – loss of life and human health. The concept of NELD has recently emerged as a policy issue in the negotiations under the United Nations Framework Convention on Climate Change. The goal is to implement or develop approaches that minimise the risk of NELD occurring or that effectively respond to losses. This paper is the first to propose the distinctions between approaches to avoid NELD and approaches responding to unavoidable NELD. It provides a conceptual framework in which the highly diverse cases of NELD can be categorised. It identifies the main characteristics of NELD items and their associated challenges for policy-making. Building on this conceptual approach, the paper sketches an ideal international policy framework that addresses NELD and provides policy recommendations at the national level.

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Bonn, February 2016

Olivia Serdeczny, Eleanor Waters and Sander Chan

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Abbreviations

AOSIS	Alliance of Small Island States
COP	Conference of the Parties
CRI	Composite-Risk Indices
EV	Economic Valuation
IPCC	Intergovernmental Panel on Climate Change
MCDA	Multi-Criteria Decision Analysis
NELD	Non-Economic Loss and Damage
QSA	Qualitative / Semi-Quantitative Approaches
UNFCCC	United Nations Framework Convention on Climate Change
WIM	Warsaw International Mechanism

1 Introduction

Non-economic loss and damage (NELD) is a concept that has emerged in the context of the United Nations Framework Convention on Climate Change (UNFCCC). It constitutes a part of the wider climate change discourse in three ways: (i) as an argument for more stringent climate mitigation, (ii) as an assessment lens for comprehensive adaptation planning and (iii) as an assessment lens for recording unavoided climate impacts.

Although the policy process is evolving and decisions on how to address NELD will need to be made over the next few years, knowledge about NELD in relation to climate change is scarce and very few publications explicitly address NELD. Nonetheless, many valuable insights on different aspects of NELD exist across different disciplines. A concerted effort by the research community to gather and integrate insights, to render conceptual clarity and to address emerging research gaps could yield significant benefits for decision- and policy-makers. This paper contributes to such integration and the conceptual clarification of NELD.

1.1 What are NELD?

Imagine the following scenario: an island community needs to relocate because sea-level rise has rendered its land uninhabitable. What are the changes an island community faces? At first, infrastructure is left behind; cultivated land is lost and crops can no longer be harvested; fisheries are abandoned and income opportunities are lost, at least temporarily. Then the community resettles in some safer remote area. If all goes well, new income opportunities arise and individuals diversify their skills. They earn a living, and some of them may thrive in those new surroundings; comparing *per capita* income before and after relocation may show the latter's beneficial effects. Things look good. Apart from the infrastructure and a year or two of income, not much seems to have been lost – and even that may eventually be outweighed by the beneficial effects of higher earnings.

Accounting for NELD changes the perspective: not only is arable land lost, but also landscapes. Not only are fisheries lost, but also traditions. New ways of income generation are learnt, but old ways of knowing and relating to the environment are lost. The task of adapting to new realities may cause stress, a sense of loss and disorientation. When a community of fishermen and farmers is dislocated from the sea and their lands, what happens to their identity? Is that lost, too?

NELD reverberate through the material and non-material spheres of human lives and societies. Loss of cultural heritage, traditional knowledge or place identity may leave communities disconnected from their sense of self and each other. Losses are felt at both the individual and communal levels. The concept of NELD thus takes into account material and non-material dimensions that defy quantification or monetisation but are still deemed valuable by people who are faced with losses.¹

1 The term “non-economic” may be misleading, as economic theory does provide frameworks for analysing items that are not traded in the market. Alternative terms such as “non-market values” are sometimes suggested but have not been published to date.

Cases of NELD here are termed “items” and can be both material and non-material. NELD items can be of intrinsic value as well as instrumental value. For example, there is intrinsic value in social cohesion; at the same time, social cohesion also underpins human security. These value dimensions render a neglect of NELD – in which intrinsic values are lost and ignored – ethically questionable. Moreover, if values underpinning societal functioning and well-being are lost, this may be inefficient from a broader policy perspective that considers, for instance, social stability.

Box 1: The logic of NELD

Within the wider discourse on climate change, the concept of loss and damage functions on two levels. On a practical level, it is to gather support and practical means to either avoid or to cope with unavoidable climate impacts. On a meta-level, it is to seek recognition – or shed light on injustice – in the face of the transboundary harm caused by human-made climate change. At the assessment stage, both of these levels are closely linked and require a comprehensive understanding of the negative effects of climate change. In order for practical means to be effective and to anticipate future risk, they need to be designed on a base of solid evidence. At the same time, assessing climate impacts and the value of the losses raises questions of representation and fairness. Any loss is a matter of value and perspective; different communities value different items in different ways. Whose losses will count? Value diversity needs to be accounted for when assessing NELD, and acknowledging non-economic loss and damage is a necessary ingredient for responding to them in a just and effective manner.

1.2 How do non-economic loss and damage occur?

NELD are always mediated by societal factors that shape the vulnerability of systems to physical impacts and by culture, which provides the context according to which items are experienced and valued. Despite these contextual complexities, the evidence available in the literature shows that a distinction can be made between losses that occur directly and those that occur indirectly due to climate change. Direct losses occur when the effects of climate change physically damage or destroy valuable items. This is the case, for example, in the Caribbean, where tropical coral reefs are eroding (Gardner, Côté, Gill, Grant, & Watkinson, 2003), or in the Zambezi river basin in Mozambique, where homes have been destroyed due to flooding and tropical cyclones (Stal, 2009). Direct losses are often compounded by human activity, for example by marine pollution and deficient flood preparedness in the two cited examples.

Indirect losses are mediated by one or several processes but are initially triggered by the physical effects of climate change. For example, a heavy flooding event in Kenya (the physical trigger) could lead to a malaria outbreak (the mediating factor), which negatively affects human health (a NELD item).² Similarly, heavy flooding (physical trigger) can lead to migration (the mediating process), which causes the loss of societal networks (a NELD item), further destabilising local communities and leading to loss of security (another NELD item) (Wrathall, 2012).

The same kind of loss can occur through both direct and indirect pathways. For instance, flooding following heavy rains in June 2015 created the risk of homes being destroyed in

² Unpublished data from the Institute for Environment and Human Security at the United Nations University.

the Douala V district area in Cameroon. However, the risk of NELD in this case was not due to the flooding directly. Rather, government officials announced that most of the homes would be evacuated and torn down. As one government delegate put it: “*We think the only way to put an end to such catastrophe in the future is to demolish and force people out of these risky and vulnerable zones*” (Ngalame, 2015).

This shows how the loss of homes – often a direct consequence of flooding in risky areas – can be mediated by human responses and can therefore also be indirect.

The concept of NELD thus includes direct and indirect (1) potential losses and damages that can be avoided through adaptation, (2) potential losses and damages that cannot be avoided through adaptation and (3) negative side-effects of adaptation, which would not have occurred without climate change.

The extent to which losses can be attributed to anthropogenic climate change is an important research question associated with high uncertainties (James, Otto, Parker, Boyd, Cornforth, Mitchell, & Allen, 2014). In this context, the argument commonly made – that cultural change is a ubiquitous part of life – needs to be carefully weighted. Cultural change as an organically evolving process – due to generational change or the globalisation of goods – in principle comes as a side-effect of a process that is potentially beneficial to those affected, for example economic development or access to markets. This is much less the case with climate change, in which those affected by NELD rarely have access to the benefits of fossil fuel combustion as the primary driver of change. However, a clear understanding of the conditions under which NELD can be attributed to anthropogenic climate change is not yet available.

1.3 What is the challenge?

NELD pose at least three broad challenges: (1) measurement and valuation, (2) communication and (3) decision-making.

Measurement and valuation

Many NELD items are intangible and do not occur in distinct units. Although standardised measurements exist for some items (e.g. health), others have not been subject to systematic assessments. Moreover, the concept of NELD is about value: only that which is perceived as valuable will register as being lost or damaged. Value, in turn, is context-dependent: both the perceived scale and weight of value and the question as to what holds value will differ from culture to culture. The task of measuring NELD is thus faced with the dual challenge of defining indicators for items and of assessing their value in a manner that is true to the context. As part of the wider loss and damage context, attribution of NELD to anthropogenic climate change presents an additional research challenge.

Communication

Communicating the importance and meaning of NELD is equally challenging. Economic studies have shown that decision-making is co-determined by non-monetary factors. For example, research in *identity economics* demonstrates that agents will choose certain

courses of action depending on the expected effects on their identity, even when this may lead to lower levels of consumption (Akerlof & Kranton, 2011). In other words, people do not always act to maximise monetary benefits. Yet, communicating the importance of non-monetary values is still challenging, particularly when the cultural context in which somebody else's values are perceived differs strongly from one's own.

Decision-making

NELD pose particular challenges in decision-making contexts that strive for economic efficiency and often rely on cost-benefit analyses. Many NELD items are incommensurable, meaning that there is no common unit through which their value can be expressed. Such a condition makes monetary assessment challenging, if not conceptually meaningless. Incommensurability thus defies the inclusion of NELD in decision-making frameworks that singularly strive for economic efficiency. The challenge will therefore be to assess and report NELD in a way that is sensitive to context and different value-systems, but that still speaks to decision-makers who usually rely on a quantified and/or monetised information basis.

This paper focusses on the challenges associated with measuring and valuing NELD in an international setting. Starting off with an overview of the current literature on NELD, it notes the absence of conceptual clarity. We address this using a conceptual framework that identifies key characteristics of a highly diverse range NELD items.

1.4 Structure of the paper

Chapter 2 sets the political context by providing a brief history of loss and damage and NELD under the UNFCCC. Chapter 3 presents the different perspectives on NELD as found in the publications on the subject. Synthesising these perspectives, a conceptual framework for understanding NELD is introduced. Chapter 4 identifies key characteristics of reported NELD cases and, based on these, presents an assessment of proposed valuation techniques. Chapter 5 provides policy recommendations for the international level by sketching the contours of an ideal international framework to address NELD and delivers recommendations for the national level.

2 NELD in the context of the UNFCCC

The concept of NELD is part of the wider discourse on loss and damage. The latter term is often not clearly defined, and definitions are often politically motivated. In the academic literature, the term "loss and damage" broadly refers to the impacts of climate change that cannot be avoided through adaptation or mitigation (Warner & van der Geest, 2013). This definition is in line with the concept of "residual impacts" in both low and high warming scenarios, as described by the Intergovernmental Panel on Climate Change (IPCC, 2014a, 2014b). In the political context, the concept of loss and damage is understood to partly overlap with adaptation, as stated in Decision 2/CP.19, which established the Warsaw International Mechanism (WIM): "[L]oss and damage associated with the adverse effects of climate change includes, and in some cases involves more than, that which can be reduced

by adaptation” (UNFCCC Secretariat, 2013b). Thus, whereas the academic definition refers to actual loss and damage, the political understanding encompasses both potential and actual loss and damage.

What has not been discussed to date is whether “unadaptability” in both cases is understood to be delineated by adaptation constraints, which hinder available adaptation options, or whether loss and damage occur beyond hard adaptation limits, where no adaptation option is foreseeable (Klein, Midgley, Preston, Alam, Berkhout, Dow, & Shaw, 2014).

2.1 Chronology of loss and damage

An overview of the history of loss and damage in the context of the UNFCCC shows the development from an issue primarily associated with insurance to a more complex approach of risk-reduction and the inclusion of non-economic elements (Table 1).

The genesis of loss and damage in the political context begins with a submission by the Alliance of Small Island States (AOSIS) in 1991. As part of the Elements for a Framework Convention on Climate Change, AOSIS called for an insurance pool that would compensate the most vulnerable small island and low-lying coastal developing countries for loss and damage resulting from sea-level rise (Intergovernmental Negotiating Committee for a Framework Convention on Climate Change, 1991, p. 126). The call was not explicitly taken up under the UNFCCC. However, the Preamble of the Convention implicitly refers to transboundary damage, and Article 4.8 includes insurance as an action which may be necessary to “*meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change*” (United Nations Framework Convention on Climate Change [UNFCCC], 1992).

The discussion on insurance continued in the following years. In 2001, for example, the Conference of the Parties (COP) decided to consider “*the implementation of insurance-related actions to meet specific needs and concerns of developing country Parties arising from adverse effects of climate change*” (UNFCCC Conference of the Parties, 2001). It also called for a workshop on actions for such implementation, which was held in 2003 in Bonn (UNFCCC Conference of the Parties, 2003).

The next appearance of the subject in the climate negotiations was in 2007, when the term “loss and damage” was mentioned in the Bali Action Plan in the context of adaptation. Specifically, risk-reduction and -management strategies were mentioned as means of addressing loss and damage (UNFCCC Conference of the Parties, 2007). The anchoring of loss and damage in the thematic area of adaptation was to develop into a contested issue throughout the following negotiation cycles.

Notably, the Bali Action Plan had not addressed the issue of compensation or insurance in relation to loss and damage. Perhaps it was in reaction to this that, in 2008, AOSIS submitted another proposal for the establishment of a new Multi-Window Mechanism to Address Loss and Damage from Climate Change Impacts as an essential part of the post-2012 agreement. The Mechanism should consist of three interdependent components: 1. Insurance; 2. Rehabilitation / Compensation; 3. Risk Management (Alliance of Small Island States, 2008). The call for a Multi-Window Mechanism was reiterated in the 2012 AOSIS

submission responding to the invitation to the Parties to submit their views and information on the possible elements to be included in the recommendations on loss and damage (UNFCCC Conference of the Parties, 2011, paragraph 9).

Table 1: Overview of history of loss and damage in the UNFCCC context		
Year	Event	Content
1991	Preparations for 1992 Convention	AOSIS submission on Elements for the Framework Convention on Climate Change calling for International Insurance Pool to compensate the most vulnerable small island and low-lying coastal developing countries for loss and damage resulting from sea-level rise
2001	COP7 in Marrakesh	Decision to consider implementation of insurance-related actions at following COP
2003	UNFCCC Workshop in Bonn	Workshop on the implementation of insurance-related actions to meet specific needs and concerns of developing country Parties arising from adverse effects of climate change
2007	COP13 in Bali	First mention of loss and damage in Bali Action Plan in the context of adaptation. Focus on disaster reduction and “other means”
2008	Preparations for post-2012 agreement	AOSIS submission (in response to call for essential parts of the post-2012 agreement) calling for the establishment of a new Multi-Window Mechanism to Address Loss and Damage from Climate Change Impacts, consisting of <ul style="list-style-type: none"> - an insurance component - a rehabilitation / compensatory component - a risk-management component
2010	COP16 in Cancun	Cancun Adaptation Framework: decision to establish a work programme on loss and damage
2011	COP17 in Durban	Refinement of work programme (to be established) by three thematic areas: <ul style="list-style-type: none"> - assessing risks - approaches to address loss and damage - role of Convention
2012	COP18 in Doha	Agreement of role of the Convention in implementing the approaches to address loss and damage: <ul style="list-style-type: none"> - enhancing knowledge - strengthening dialogue - enhancing action and support First mention of non-economic loss and damage as area of further work to enhance understanding and request to prepare technical paper
2013	COP19 in Warsaw	Warsaw International Mechanism for loss and damage, under the Cancun Adaptation Framework, subject to review at the 22nd session of the Conference of the Parties (November–December 2016) Establishment of interim Executive Committee and request to develop its initial two-year work plan
2014	COP20 in Lima	Approval of WIM two-year work plan, including an Action Area on non-economic loss and damage with the specific tasks of: <ul style="list-style-type: none"> - raising awareness of nature and extent of, and responses to, non-economic loss and damage - establishing expert group
2015	-	Nomination of WIM Executive Committee (June) and first meeting (September)
2015	COP21 in Paris	Article 8 on loss and damage is included as part of the Paris Agreement, ensuring the permanence of the issue under the UNFCCC
Source: Authors		

In continuation of the Bali Action Plan, the concept of loss and damage was anchored in the Cancun Adaptation Framework in 2010. It was decided by the Parties that a work programme was to be established with the aim of considering approaches to address loss and damage (UNFCCC Conference of the Parties, 2010). This considerably broadened the issue, from one mention in the context of adaptation and risk-reduction in the Bali Action Plan to a separate work programme on loss and damage.

The content of this work plan was further developed one year later, when three thematic areas were identified that were to be taken into account in the further implementation of the work plan (UNFCCC Conference of the Parties, 2011):

1. assessing the risk of loss and damage associated with the adverse effects of climate change and the current knowledge on the same;
2. a range of approaches to address loss and damage associated with the adverse effects of climate change, including impacts related to extreme weather events and slow onset events, taking into consideration experience at all levels;
3. the role of the Convention in enhancing the implementation of approaches to address loss and damage associated with the adverse effects of climate change.

These thematic areas continue to broadly guide the work on loss and damage at the technical level of the UNFCCC, that is, in terms of implementing the work plan.

The third thematic area was addressed at the following COP in 2012. The role of the Convention was primarily to enhance knowledge, strengthen dialogue and enhance action and support – including finance and technology – to address loss and damage (UNFCCC Conference of the Parties, 2012, p. 22). It had further become clear that the issue of loss and damage needed to be approached in a comprehensive way, covering both slow onset changes and extreme events, and that the non-economic dimension needed to be included. Indeed, this was the first time that NELD were mentioned as further work was acknowledged “*to advance the understanding of and expertise on loss and damage [...] including (ii) Non-economic losses and damages*”. Additionally, a technical paper on non-economic loss and damage was requested (UNFCCC Conference of the Parties, 2012, p. 23). The technical paper was published in October 2013 and is identical in content to the publication by Fankhauser, Dietz, and Gradwell (2014) (for a discussion of this technical paper, see Chapter 3).

Loss and damage was finally institutionalised with the establishment of the “*Warsaw international mechanism for loss and damage, under the Cancun Adaptation Framework, subject to review at the twenty-second session of the Conference of the Parties (November–December 2016)*” in 2013 (UNFCCC Conference of the Parties, 2013, p. 6).

With the WIM, the interim Executive Committee was established and requested to develop an initial two-year work plan and to “*report annually to the Conference of the Parties through the Subsidiary Body of Scientific Technological Advice and the Subsidiary Body*” (UNFCCC Conference of the Parties, 2013, p. 6). NELD became part of this work plan, which was adopted in 2014. The explicit tasks related to NELD are (UNFCCC Secretariat, 2014):

- (a) Raise awareness of the nature and extent of non-economic losses and of how to integrate measures to reduce the risk of non-economic losses in comprehensive approaches to addressing loss and damage associated with the adverse effects of climate change.
- (b) Establish an expert group to develop inputs and recommendations to enhance data on and knowledge of reducing the risk of and addressing non-economic losses, including how to factor these into the planning and elaboration of measures to address loss and damage associated with the adverse effects of climate change.

The nominations and eventual appointments of 10 members from Annex I Parties and 10 members from non-Annex I Parties for the WIM Executive Committee were secured in 2015.

At COP21 in Paris, the issue of loss and damage was finally included as a stand-alone article, as had been called for by most developing countries. The article stresses the cooperative and facilitative basis on which loss and damage is to be addressed and lists non-economic losses as a potential area of cooperation. The permanence of the issue under the UNFCCC is thereby ensured, critically increasing the need for sound policy recommendations to guide the implementation of approaches to loss and damage.

At the operational level, the WIM is currently tasked with advancing work on loss and damage. The WIM work plan mainly consists of knowledge accumulation, both on gaining a better understanding of the risks of loss and damage and on considering possible mechanisms to address such risks. The work plan also includes the task to develop a five-year rolling work plan “*to continue guiding the implementation of the functions of the Warsaw International Mechanism*” (UNFCCC Secretariat, 2014, Action Area 9). Given the slow start and the scope of the WIM work plan, it remains to be seen when concrete institutional arrangements dealing with loss and damage – and implicitly NELD – will materialise. Nonetheless, the process has begun and insights gained through activities under the WIM are likely to constitute the building blocks for an institutional structure in the future.

Given a dynamically progressing political process, there is a risk that research does not keep up with the speed of policy-making. Institutional path dependencies may be created before research findings are able to inform the policy process. It is therefore important to gather insights that exist from different research disciplines in a conceptually sound way and timely manner as well as to critically assess their applicability to NELD and to gaps in our understanding.

2.2 What does “addressing loss and damage” mean?

To date, there is no agreement on the instruments through which loss and damage should be addressed. UNFCCC documents refer to a wide range of tools and instruments, including catastrophe-risk insurance (UNFCCC Secretariat, 2014; Action Area 7), post-climate-related disaster recovery, rebuilding and rehabilitation (UNFCCC Secretariat, 2014, Action Area 5b) and comprehensive risk-management approaches (UNFCCC Secretariat, 2014, Action Area 2).

Within the research domain, insurance and risk-management are frequently mentioned as instruments to address loss and damage. Although these instruments are likely to yield concrete and actionable recommendations, it is not clear how they respond specifically to the impacts of climate change and which instruments are able to respond to loss and damage under different climate change scenarios.³

In discussing approaches to loss and damage, it is useful to distinguish between measures aimed at *preventing* loss and damage from occurring and measures aimed at *responding* to unavoidable loss and damage. Whereas approaches to avoiding loss and damage mostly overlap with climate adaptation, responses to unavoidable loss and damage will likely require qualitatively different – and perhaps novel – tools and instruments. Furthermore, the data requirements might diverge for both sets of approaches. The knowledge base for avoiding NELD might require comparability with other economic items for their integration into comprehensive adaptation planning. Adequately responding to permanent NELD, in turn, might rely more on a deep qualitative understanding of the functions that the lost values had in terms of contributing to the well-being of affected societies. Reflecting this distinction, the policy recommendations provided in the outlines of an ideal international framework to address NELD are structured along a preventive and a reactive pathway.

3 Providing a systematic overview of highly diverse NELD items

Given its novelty, literature focussed explicitly on NELD is scarce. To date, three reports have been published on the subject: a Technical Paper by the UNFCCC Secretariat (UNFCCC Secretariat, 2013a; same as Fankhauser et al., 2014), a publication on the “Loss and Damage in Vulnerable Countries Initiative” (Morrissey & Oliver-Smith, 2013) and a report on NELD supported by the Asian Development Bank has been published in Bangladesh (Andrei, Rabbani, & Khan, 2015).

Each of these reports highlights different aspects of NELD. The report by Fankhauser et al. (2014) is more technical than the others, and by mandate includes a description of ways in which NELD may materialise, different assessment techniques and implications for adaptation planning. Morrissey and Oliver-Smith (2013) place a stronger focus on the underlying assumptions of economic assessments and provide the anthropological backdrop against which the meaning and value of NELD can be grasped. The report by Andrei et al. (2015) summarises original empirical research results. Integrating insights from these publications shows that there is no common understanding on how to conceptualise NELD and that perspectives on NELD differ across research communities.

3 Political sensitivity in this context arises from the fact that disaster risk-management is a matter of national responsibility (United Nations Office for Disaster Risk Reduction, 2015). It is developed to deal with natural disasters and does not deal with transboundary anthropogenic factors, which increase the risk of loss and damage beyond the control of those affected. The associated question of fair burden-sharing in dealing with climate impacts will likely be reflected in institutional arrangements rather than affect the instruments that will be deployed to address loss and damage on the ground.

3.1 Non-economic items reported in the literature

Fankhauser et al. provide an *ex-negativo* definition of NELD: “*non-economic items are those that are not commonly traded in markets*” (2014, p. 3). They further list eight types of NELD (Fankhauser et al., 2014, Table 2), distinguishing between loss to private individuals, loss to society and environmental loss. Morrissey and Oliver-Smith (2013) provide a distinction between material and immaterial, and between economic and non-economic losses, listing nine examples in the non-economic sections plus two that are considered to fall between economic and non-economic (Morrissey & Oliver-Smith, 2013, Figure 1). Andrei et al. (2015) provide six broad categories of NELD (see Table 2).

The sources for items in each report differ. Items reported in Andrei et al. (2015) are the result of focus group discussions and interviews with key informants in south-west Bangladesh. The items listed in Fankhauser et al. (2014) are based on cases identified in the literature. Causal pathways on how they can be triggered directly or indirectly by climate change are provided (pp. 26–34). Many items listed by Morrissey and Oliver-Smith (2013) are not explained in the text. Although it is clear that some of the non-material items (social cohesion, loss of ability to solve problems collectively) have been observed in case studies of forced displacement that are outlined in the report, the listing of remaining items appears to principally rest on expert knowledge and judgement.

Table 2 integrates these sources. Two columns are provided for Fankhauser et al. (2014), as the authors distinguish between the type and description of an item in their work (p. 26). For reasons of transparency and traceability, these are depicted separately. Where there is overlap between sources, items are provided in the same row.

Although there is overlap, no agreement exists on how to describe and conceptualise NELD. Some items appear in all sources (life, human health, biodiversity, cultural sites / heritage, biodiversity); others appear in different categories and on different logical levels. For example, in some cases *processes* are listed as *items* of loss (e.g. human mobility, territory abandonment). In the associated text, this divergence between process and item of loss is partly appreciated – for example, for the item human mobility, the following description is given: “[D]isplacement can cause distress and a loss of health or social networks [...] displacement can result in a loss of security (including legal rights) and agency (the ability to control one’s location and livelihood), among other things.” (Fankhauser et al. 2014, p. 31). Thus, when viewing this statement while keeping the question of “What is lost?” in mind, items of agency and security emerge, triggered by the process of displacement.

However, displacement is clearly assigned the status of loss in the text: “[D]isplacement also constitutes a unique type of loss and damage in itself and is not just a cause of other types of loss and damage” (Fankhauser et al., 2014, p. 31). No further explanation is given as to what exactly is lost. Similarly, “territory abandonment” is provided as an example of NELD in a figure in Morrissey and Oliver-Smith (2013), while the text describes losses that can be caused by territory abandonment (forced relocation), including loss of social cohesion and traditional ways of life (p. 10). No explanation is given as to why territory abandonment is listed as an item of loss itself. Such conceptual ambiguity (*items* of loss versus *processes* leading to loss) indicates the imprecise conceptualisation of NELD.

Table 2: NELD items reported in the literature			
Fankhauser et al. Table 2, column “type”	Fankhauser et al. Table 2, column “description”	Morrissey & Oliver-Smith Figure 1	Andrei et al.
Loss of life		Loss of life	
Health		Adverse health impacts	Physical and psychological well-being
Human mobility	Dignity Security Agency		
Territory	Sovereignty Sense of place	Territory abandonment	
Cultural heritage	Social cohesion Identity		
Indigenous knowledge	Social cohesion Identity	Decline of indigenous knowledge	
Biodiversity		Biodiversity loss	Biodiversity / species
Ecosystem services			Ecosystem services
		Destruction of cultural sites	
		Loss of culturally important landscapes	
		Habitat destruction	
		Loss of identity and ability to solve problems collectively	
		Loss of knowledge / ways of thinking that are part of lost livelihood systems	
		Social cohesion, peacefully functioning society	
			Education
			Traditions / religion / customs
			Social bonds / relations

Explaining the divergence across the sources of NELD items is necessarily speculative. Yet, one reasonable assumption is that the academic backgrounds of researchers shape their understanding of what can be considered an item of loss. This hypothesis can be illustrated with *identity* as a NELD item. Fankhauser et al. (2014) do not explicitly list it as an item that can be lost, but rather link loss of identity to cultural heritage. Morrissey and Oliver-Smith (2013), by contrast, list “loss of identity” as a loss item.

An anthropologist is likely to be familiar with the concepts “sense of place”, “attachment to place” and “place identity” (e.g. Altman & Low, 1992; Proshansky, Fabian, & Kaminoff, 1983; Tuan, 1974) and readily assign “identity” the status of an item that can be lost through environmental drivers. This is not necessarily the case for economists, who might be more likely to focus on more clearly defined and commonly referenced items. Accordingly, reports on NELD would be more likely to reflect the academic backgrounds of their authors and result in diverging implicit assumptions on what can be lost, and therefore registered as loss.

Overall, items listed in the three sources reflect observed cases in which direct or indirect effects of climate-related environmental events have triggered changes that were experienced as adverse and recorded in the literature. Table 2 provides a comprehensive overview of the cases that have been referenced as NELD to date and captures the high level of diversity of NELD items. Notably, this list is no more than a current snapshot. As Fankhauser et al. (2014) state, “*there may be additional non-economic losses which are not considered here due to conceptual, knowledge and data gaps*” (p. 8). What also clearly emerges from this overview is that there is divergence in the conceptual understanding of NELD, which arguably complicates a systematic understanding of the issue and the identification of effective approaches to NELD in the international setting of the UNFCCC.

3.2 A conceptual framework for categorising NELD items

One way of understanding NELD beyond a patchwork of examples is through a conceptual framework. Building on Morrissey and Oliver-Smith (2013), the framework offered here (see Figure 1) distinguishes between the very basic physical attributes of material and non-material items. In addition, it differentiates between instrumental and intrinsic values. Based on the cases of NELD reported to date (Table 2), meta-categories of NELD can be developed within the four basic domains that emerge from this framework. In Figure 1 below, these meta-categories are introduced and explained in the context of the domain to which they are allocated. It is important to note that the categorisations offer a better conceptual understanding of NELD. Items and categories should not be seen in isolation from one another but rather in a systemic, comprehensive manner.

The instrumental / intrinsic value distinction

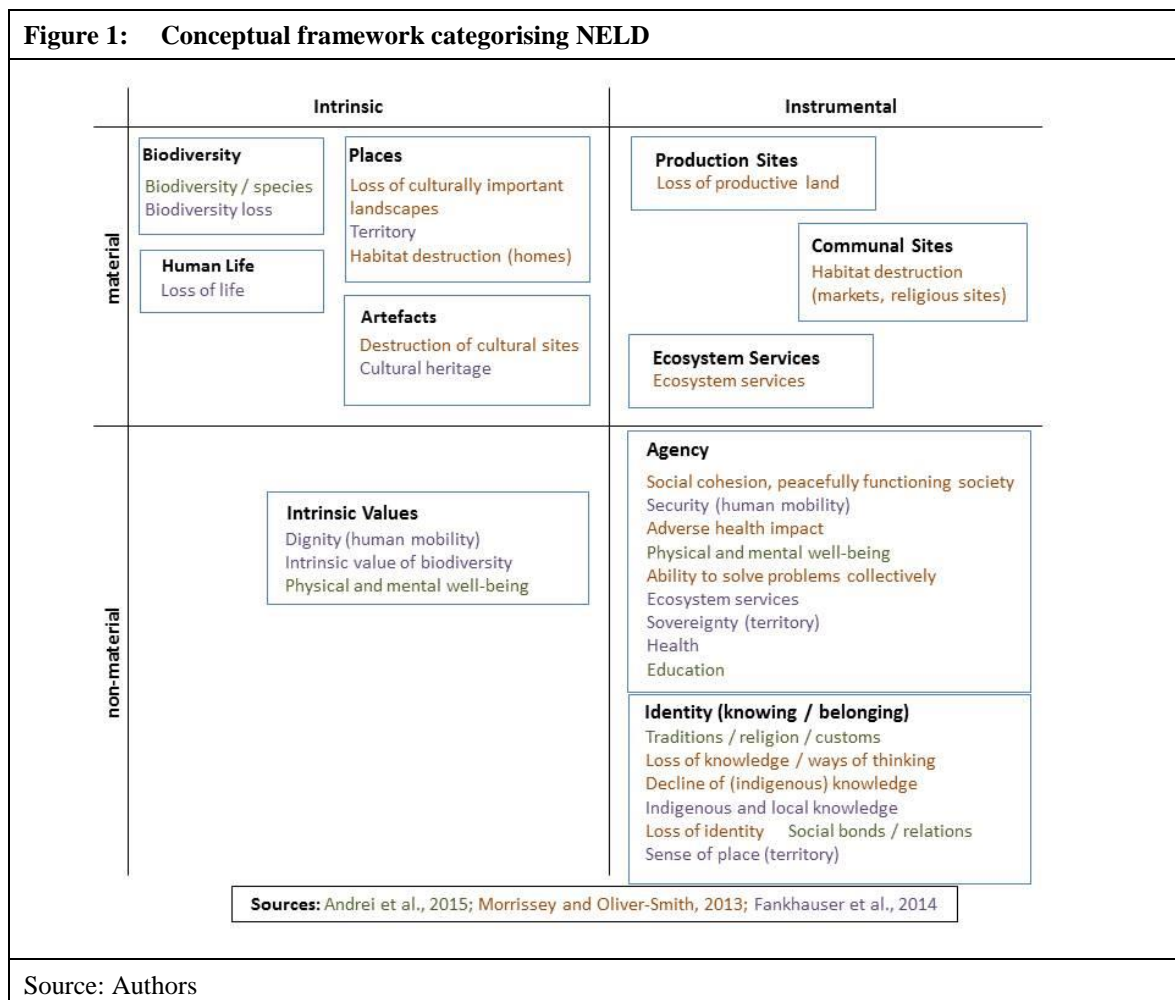
The distinction between instrumental and intrinsic values is culturally contingent. Some items might be regarded as having intrinsic value to one community but instrumental value to another. For example, whether human health should be seen as an end in itself (of intrinsic value) or as a supportive mean to enhance labour productivity (of instrumental value) can be a subject of extensive debate. The categorisation of NELD items presented here does not intend to prejudge to which value dimension NELD items belong. Rather, items were allocated to the domain of instrumental value if they are known to serve a certain goal (e.g. when ecosystem services are framed as valuable because they support the well-being of communities).

The material / non-material distinction

The material and non-material aspects of NELD are interconnected. Climate change manifests primarily through biophysical changes to the environment. Non-material loss and damage is thus an indirect effect of climate change, mediated through objects or places in which practices and meaning are embedded. Were the non-material to be disconnected from the material, the former could not be affected by climate change. However, several studies illustrate the cultural impacts of climate change (Crate, 2008) and the negative effects on mental health (Bell, Brubaker, Graves, & Berner, 2010) (Albrecht, Sartore, Connor, Higginbotham, Freeman, Kelly, ... Pollard, 2007), pointing to the occurrence of physical changes reverberating through the non-material sphere. Neither sphere is thus fully detachable from the other.

The relevance of the interconnectedness between the material and non-material goes beyond academic interest and scrutiny: claims of culture loss suffered by Alaskan natives following the Exxon Valdez oil spill in 1989 were rejected by Judge Holland on the basis that culture was deemed to be “*deeply embedded in the mind and the heart*” and could therefore not be affected by environmental factors (Jorgensen, 1995 in Kirsch, 2001). Thus, when culture, or identity, is understood to be purely non-material phenomena, there is no basis on which it can be claimed to have been lost by way of physical changes to the material sphere; a dispute much discussed in academia becomes a matter not only of legal rights but also of normative power and force.⁴

The material / non-material distinction may appear to be less controversial at first: material is what is visible and tangible; everything else is non-material. However, the visibility of mental health effects, for example, is debatable. Depression in some cases may be displayed through visual expressions and body posture. In other cases, it may remain invisible or only be revealed through the means of words or deeds. The framework presented here is thus explicitly seen as a suggestion to enrich the conceptual discourse on NELD as a basis for methodological and practical considerations in terms of decision-making.



4 A remarkable turn of argument can be observed here, where the embeddedness of culture in environmental / physical factors (typically an “essentialist” position) is rejected to serve an essentialised understanding of culture by the judge.

3.2.1 Meta-categories of NELD

The following meta-categories emerge from the framework proposed in Figure 1:

- Human Life
- Meaningful Places
- Cultural Artefacts
- Biodiversity
- Communal Sites
- Intrinsic Values
- Agency
- Identity
- Production Sites (tentative)
- Ecosystem Services

They are explained according to the domain in which they are placed.

The material-intrinsic domain

Four meta-categories emerge from the material-intrinsic domain: Life, Places, Artefacts, Biodiversity.

Human Life here is considered to be of intrinsic value and, due to its dependence on bodily functions, is grouped under the material domain.

Places are geographical spaces that are imbued with meaning and are considered particularly valuable by people who relate to them. A home can typically be considered a place (Creswell, 2004). Similarly, landscapes are often seen as unique sites that contribute to a sense of identity and continuity (Greider & Garkovich, 1994). The relative importance that is given to place is evidenced *inter alia* in observed resistance to landscape transformations through the construction of wind turbines in Germany (Bosch & Peyke, 2011).

Artefacts are man-made objects that are imbued with meaning and, as such, serve as expressions and reference points for a shared culture. Although they could be grouped according to their instrumental value in their service of maintaining cultural identity and social cohesion, they retain intrinsic value, also after the disappearance of the particular population that related to them.

Biodiversity has been defined as the richness of genes, species and ecosystems (Swingland, 2000). As a subject of rich academic debates, biodiversity has been recognised as holding intrinsic value for many populations (Sandler, 2012).

The material-instrumental domain

Two meta-categories are positioned in the material-instrumental domain: Production Sites and Communal Sites.

Production Sites are geographical spaces that are used to produce goods such as agricultural crops. In principle they can be traded in the market but often go unregistered due to incomplete recordkeeping or the absence of property rights. It needs to be further

discussed whether – or under what definition – the loss and damage of production sites falls under the concept of NELD.

Communal Sites are geographic spaces in which social life and culture are reproduced, such as markets and religious sites. The question of what is lost if such places are lost or damaged is mostly reflected in the non-material-instrumental domain (e.g. social cohesion, tradition). Anthropological and sociological theories ought to be analysed more deeply for the positioning and relevance of this category.

Ecosystem Services are services provided by the natural environment to communities. Examples include food provision (e.g. berries and wild animals), water purification (e.g. oysters filtering seawater) and aesthetic pleasure (e.g. the perceived beauty of corals reefs). In their provisioning of services, they are seen here as having instrumental value.

The non-material-intrinsic domain

The non-material-intrinsic domain contains values that, in public discourse, have been recognised as ends in themselves. However, it is not clear what formal conditions need to be met for additional items, as some values are intrinsic to some items but not others. The contextuality of NELD becomes apparent here: what counts as intrinsic is a matter of perspective.

The non-material-instrumental domain

The non-material-instrumental domain contains two overarching categories: Agency and Identity. Both are closely interrelated.

Agency, in line with Bebbington (1999), leaning on Sen (1985), here is understood as the “*capability to engage [...] fruitfully and meaningfully with the world, and most importantly the capability to change the world*”. Loss of agency may trap populations in a state of vulnerability, inviting a downward spiral of impacts and further losses. The factors that negatively affect agency are manifold, and a rich literature within the social and human sciences ought to be deeper understood to further classify climate-induced effects under this category. It is grouped under the instrumental domain here because agency is seen as promoting further objectives, including human well-being.

Identity here is understood as a composite of knowing and belonging. Both components are understood to provide individuals or communities with a sense of orientation and position in the world. Identity is instrumental in the sense that it is understood to be a prerequisite for the freedom of choice between different options.

3.2.2 Utilising conceptual clarity for policy-making

This conceptual framework produces a systematic overview of nearly 30 highly diverse NELD items. By grouping items into meta-categories within the framework, the different dimensions and functions of NELD items can be better understood and approaches to address them identified. It shows that instruments aimed at increasing the agency of affected communities have the potential to address multiple NELD items, including loss of

social cohesion and negative repercussions on mental health. Similarly, the recognition of the intrinsic dimension of certain NELD items may indicate the limits of instruments that address the instrumental level. For example, increasing the resilience and agency of communities will likely not succeed in addressing their sense of irreversible loss in the face of cultural heritage. For such losses, dedicated approaches need to be identified. A structuring as presented in this paper can help lay the basis for systematic approaches to address NELD.

4 Analysing key characteristics of NELD items

A useful approach to synthesising and better understanding the high level of diversity of NELD items is to analyse what they all have in common – their key characteristics. Often, these characteristics are the reason for which items are not traded in the market. As will be shown in the following sections, such an analysis allows for the identification of principles that should be followed in policy-making and for a systematic choice of adequate valuation methods.

4.1. Inalienability / incommensurability

The value of many NELD items is considered to be incommensurable or inalienable. Inalienability, in anthropological terms, refers to the feature of possessions, which “*are symbolic repositories of genealogies and historical events, [and] their unique, subjective identity gives them absolute value placing them above the exchangeability of one thing for another*” (Weiner, 1992, p. 33). According to Morrissey and Oliver-Smith, these are “*things for which their value cannot be separated from them*” (2013, p. 8). The separation of item and value is a prerequisite for it to be traded in the market, as the value of an item is expressed in monetary terms and can be replaced by another item that is perceived to be of equal value.

The anthropological notion of inalienability is akin to the philosophical notion of incommensurability, as described by Chang (2013).⁵ According to Chang, incommensurability “*most appropriately applies to abstract values*” (p. 1) and “[p]erhaps the most frequently recurring idea that falls under the label ‘the incommensurability of values’ is that values lack a common unit of measurement” (p. 5). Chang provides the following example to illustrate what the assumption of a common unit of measurement would consequently mean:

For example, if the value of one’s child can be measured by the same unit that measures the value of a beach vacation, then our attitudes toward the loss of value of each should be a matter of degree. Insofar as our practical attitudes are driven by the value of their objects, our attitudes toward our children should differ from our attitudes toward beach vacations only in quantity, not in quality. (p. 6)

The question of incommensurability directly relates to the issue of monetisation: “*If there is no single unit by which all values can be measured, then it is a mistake to think that all goods can be valued by some common unit, such as dollars*” (Chang, 2013, p. 5). In other

5 Both notions are used interchangeably here.

words, if the value of certain NELD items is deemed to be inalienable from the items themselves, then monetisation is conceptually incoherent.

Box 2: The vital dimensions of value

Inalienable or incommensurable value can be of vital importance to communities who share those values and are defined by them. For example, the loss of land, which is considered inalienable (homelands), can lead to the breakdown of social ties to the detriment of affected individuals. Morrissey and Oliver-Smith (2013) quote the case of the Grassy Narrows Ojibwa of Western Ontario, who had been relocated from their historical homelands “*to better provide them with government services [...] Traditional life on the reserve was oriented by indigenous perceptions of space and time expressed in residence and close social bonds and in a reverence for nature reinforced by myth and ritual*” (2013, p. 10). Following relocation, social cohesion broke down and “*alcoholism and other substance abuse, teenage and adult suicide, and violence were rampant*” (2013, p. 10). Such effects are not limited to the indigenous peoples of North America. Based on empirical work in the Pacific, Kirsch (2001) observes that “[t]he alienation of land is of general concern for indigenous peoples; [...] the loss of otherwise inalienable homelands can jeopardize not only the material conditions of survival, including subsistence practices, but also the requirements of social reproduction as embedded in kinship relations”.

Incommensurability / inalienability does not equal incomparability

Although incommensurability implies that it is not possible to scale the value of items on a single scale of measurement, it is important to distinguish it from incomparability. Often the two are conflated. Fankhauser et al. (2014), for example, claim that “[i]tems of value may be incomparable, which means that the value of one item cannot be expressed in terms of the value of another item” (p. 17; emphasis added). However, as Chang (2013) points out, incommensurability does not entail incomparability (p. 7). She suggests that two incommensurable items can still be deemed better or worse in two ways: (1) despite the absence of a common unit of measurement, individual items can still be ranked on a scale according to priority or importance; (2) the values of items can be compared according to an “imprecise” unit (p. 7).

It is also important to remember that comparability necessitates a “covering consideration” with respect to which items are ranked as better or worse. Thus, two items are never incomparable in themselves but always comparable or incomparable with respect to something else. Common covering considerations would be well-being, happiness or economic efficiency. A NELD item (e.g. loss of tradition) and another item (e.g. damage to infrastructure) may thus be incomparable with respect to their macroeconomic effects but (imprecisely) comparable with respect to their effect on communal life or well-being. Thus, rejecting “*the assumption that evaluative comparisons are modelled on the relations among real numbers, which can only be greater, lesser, or equal to one another*” (Chang, 2013, p. 8) opens up possibilities for comparing incommensurable values without having to revert to monetisation.

4.2. Context-dependence

Many, if not all, of the NELD items listed in Table 2 are based on an intricate connection between people and their environments. In particular, many items of the intrinsic / material and instrumental / non-material spheres of NELD are a product of human–environment

interactions, which have shaped both the environment itself and the value systems of people relating to it.

The non-economic value of Andean glaciers to villagers, as described by Morrissey and Oliver-Smith (2013), for example, is based on a system of traditional knowledge and cultural narratives that have formed in relation to the glaciers. The non-economic value of Andean glaciers for these villagers who have been part of these cultural systems for generations will likely differ greatly from the perhaps aesthetic value that urban dwellers would assign to it. This example illustrates how the value of NELD items is typically context-dependent.

Notably, the value of environmental features and their importance to cultural and personal identity is not limited to rural and little-developed regions. The theory of place identity, which describes the formative function of the environment on identity, was first developed in the urban context (Proshansky et al., 1983), and strong identification and attachment to a particular hill was recently voiced by Bavarian villagers in a recent German documentary (Genreith, 2015).

Context-dependence is often tied to incommensurability. For the Bavarian villagers, the value of the hill may be inseparable from the hill itself. But this is not necessarily the case: the hill's value may very well be expressed in monetary units, which would be higher in quantity than the value of a same-sized piece of land with no cultural value.⁶

4.3. Analysing valuation methods for their compatibility with NELD characteristics

The key characteristics of NELD items analysed above can be used to assess different valuation methods. The basic reasoning for such an assessment is that valuation methods should be able to preserve the characteristics of NELD, if they are to yield policy responses that can effectively address NELD. Again, conceptual clarity helps to guide choices in an effective manner.

Fankhauser et al. (2014, p. 42) suggest four basic approaches to the valuation of NELD:

1. economic valuation (EV)
2. multi-criteria decision analysis (MCDA)
3. composite-risk indices (CRI)
4. qualitative / semi-quantitative approaches (QSA)

EV functions mainly through revealed or stated preference methods⁷ and follows the objective of offering monetised results. Within MCDA, a set of criteria is established,

⁶ Not all incommensurable items are context-dependent: the value of human life, if considered intrinsic, is independent of context.

⁷ Revealed preference methods estimate prices indirectly by analysing behaviour that is linked to non-economic items, for example expenditures to treat illness in the case of health. Stated preference methods identify a participant's "willingness to pay" for maintaining an item or "willingness to accept" in compensation for its loss. Both approaches have been criticised and subject to much debate. Of particular importance in the case of NELD, willingness to pay is limited by ability to pay in developing countries, and thus inherently biased.

against which different courses of action and their consequences are measured, and CRI aim at unifying these criteria to a single, weighted index. QSA often yield multiple metrics, which, in the case of risk-assessments, are given on a qualitative scoring scale, typically from low to high.

Table 3 shows the assessment of these four valuation techniques and their respective compatibility with the NELD characteristics identified in this discussion paper.

	Incommensurability	Context-dependence of value	Comparability of results with economic assessments
Economic valuation (EV)	Incompatible	Compatibility depends on scale of assessment (generally higher at small scale)	High, provided context is maintained
Multi-criteria decision analysis (MCDA)	Compatible if assessment criteria are chosen accordingly	Compatible (provided scale of assessment is the same for all criteria)	Feasible, based on multiple metrics
Composite risk indices (CRI)	Compatible provided adequate choice and weighting of indicators	Compatible (provided scale of assessment is the same for all criteria)	Feasible, provided risk is assessed to NELD-sensitive objective
Qualitative and semi-quantitative approaches (QSA)	Compatible	Compatible (provided scale of assessment is the same for all metrics)	Low
Source: Authors			

Incommensurability

The attribute of incommensurability is conceptually incompatible with EV. EV presupposes a common unit to be the basis of any evaluation, whereas incommensurability assumes no common unit to be available to express all values. For CRI, incommensurability is conceptually not a limitation, provided NELD indicators are included and weighted (i.e. compared) with respect to their effect on a given objective that is meaningful in relation to NELD, for example well-being. MCDA and QSA are also compatible with incommensurability, if assessment criteria are chosen to include dimensions of NELD.

Context-dependence of value

The compatibility of EV with the attribute of the context-dependence of value of many NELD items is not straightforward and raises further questions. Willingness to pay and willingness to accept can be applied to approximate values of items within a certain context to the effect that the value of items can be compared to other, economic items

within the same context. Thus, the value of traditional knowledge, if not considered incommensurable by the community in question, could be expressed in monetary terms and weighted against the value of crop yields or health services. However, if the scale of the assessment is to be broadened, for instance from the local to the national, then the context-dependence of value poses a conceptual challenge to EV, as a universal meaning of the identified economic value would be presupposed. For example, if a given rural community estimated the value of traditional knowledge at US\$ 100 per year, then it would implicitly be assumed that an urban community would estimate an equal value. In other words, context-independence of value would be presupposed in order to better allow the integration of values across scales. The compatibility of EV with the attribute of the context-dependence of value thus depends on the objective and scale of the assessment. These, as well as underlying assumptions, ought to be made clear if the method is applied. Conceptually, the same conditions that apply to MCDA, CRI and QSA also apply to EV: if the scale of the assessment is the same for all assessed criteria, then context-dependence does not hinder its applicability, as context-dependence is preserved.

CRI and QSA are thus compatible with the context-dependence of value, provided the scale of assessment remains the same for all criteria.

Comparability of results with economic assessments

The comparability of results with economic assessments is high for EV, provided the context of the assessment of NELD value is the same as for the economic items. Within MCDA, criteria can in principle be compared to economic assessments, for example, if all criteria are weighted against a common objective. A similar premise applies to CRI, where a single index can in principle be compiled, for example, to reflect composite exposure to a given number of risk factors to a unitary objective (e.g. well-being). Within QSA, comparability with economic assessments is in principle feasible, if risks are compared to a common objective and no quantitative probability-based assessment of risks is required. However, because qualitative assessments are often aimed at understanding processes rather than giving quantitative estimates, the goal of such assessments differs from economic ones and comparability of different results is not meaningful. In such cases, comparability with economic assessments is therefore low.

It should also be noted that comparability is not to be confused with the integration of economic estimates. Such integration, if done in monetary units, is only feasible with economic valuation approaches.

This assessment shows that, in order to be compatible with key NELD characteristics, valuation methods need to be carefully chosen. In particular, the objective against which different results will be compared will often determine whether methods are compatible with attributes. If the objective is economic efficiency in terms of consumption losses, then MCDA is less compatible with incommensurability than in a scenario in which the objective is the maintenance of a community's self-determined well-being. Clarifying such framing assumptions at the outset will produce results that can meaningfully capture the value of NELD and provide a sound basis for policy-making.

4.4 Policy challenges associated with NELD characteristics

The key characteristics of NELD items analysed in this report present a number of challenges for policy-making. Incommensurability implies that the reflection of NELD values in monetary terms is problematic. It also implies that losses might be irreplaceable. From this, two distinct challenges arise: that of valuation techniques, and that of instruments to address incommensurable NELD. Context-dependence of value poses a challenge, particularly if the issue is to be addressed in an international setting.

Regarding incommensurability, the question of valuation techniques is often framed as a choice with two options: to monetise or to ignore. Such a position presupposes that the objective of recording and valuing NELD is their integration into aggregate climate-risk assessments and/or cost-benefit analyses. However, in order to address the issue of monetisation, it is important to first consider what purpose an assessment of NELD is to serve. For example, if the value of traditional knowledge ranks high from the perspective of a certain community, then such information can drive the design of effective adaptation measures that incorporate traditional knowledge, irrespective of its economic value. Similarly, the recognition that place identity is of high importance to the well-being of community members could yield approaches to adaptation that preserve this value (for example, by empowering communities to rebuild familiar structures in new places). For such purposes, QSA are likely to yield more useful results than the other approaches. What follows is that a reflection on the ways in which results will be utilised should precede the choice of valuation techniques.

Instruments addressing incommensurable NELD will likely not require monetary valuation as an information basis. For example, Thompson and Otto (2015) argue that the recognition of people who suffer harm from anthropogenic causes plays an important role in restoring a sense of justice, without necessitating an allocation of blame. The fundamental issue in such identity recognition, they argue, is that there is a significant difference between victims of natural disasters and victims of actions that are at least partially acknowledged as moral wrongs. A loss in cultural identity or cultural heritage might thus be more adequately addressed in terms that do not involve monetary assessments, but that rather acknowledge the incommensurability and associated irreplaceability of what has been lost. However, further dedicated research into adequate responses to loss of incommensurable value is needed.

The context-dependence of NELD values will need to be accounted for in any institutional framework dealing with loss and damage. This raises the question of how to reflect values that differ across cultures in a setting that is applicable to all. What will be the basis on which cases are recognised and acknowledged as NELD? A catalogue of standard NELD indicators could be the basis for such recognition. Such indicators would likely have pragmatic consequences. Indicators are not only used to identify potential or actual losses but also to score vulnerabilities and may, at some point, inform decisions on financial flows and other forms of support. Yet, the definition of a finite set of indicators runs the risk of representing one or a few cultural interpretations at the expense of many others. Relying on a standard set of assessment rules could present a viable alternative to a fixed catalogue of items.

5 Policy recommendations

It will take time for a framework to develop that addresses NELD under the UNFCCC. More research will be necessary, concepts need to be clarified and many decisions will be made along the way. In the meantime, it is useful to imagine the contours of an ideal framework designed to address NELD (Section 5.1). Policy recommendations made for the national level (Section 5.2) address the evidence base that is needed to adequately address NELD.

5.1 An ideal international policy framework to address NELD

The outlines of an ideal international policy framework could guide the implementation of policy principles at the international level. It could ensure an effective treatment of NELD according to their key characteristics.

Assessment stage:

Set rules for assessment rather than rules for what counts as NELD

The normative dimension of climate change is starkly visible in the field of NELD: it underlies the question of whose worldview counts in terms of defining loss and damage. An ideal framework would acknowledge that harm has been experienced and would refrain from pre-defining what precisely is considered harmful (i.e. whether NELD is a legitimate concern or not). Legitimacy of concerns would be based on the application of internationally agreed assessment rules, the results of which would be internationally recognised and harm would be acknowledged. The universality of standards needed for an international framework would thus have shifted from end-point indicators to a process-based scheme of assessment rules and the context-dependence of NELD values thus would be preserved.

Preventive pathway (potential cases):

Include NELD in decision-making on adaptation

In order to prevent NELD from occurring, stringent mitigation is the safest risk reduction. Where mitigation is not enough, considerations of NELD as part of adaptation planning are key. In the case of potential incommensurable NELD, tools other than cost-benefit analyses need to be drawn on in order to decide on the best adaptation pathway in each case. These can include comparing possible action pathways in terms of their effect on the objective, as defined by the community in question (e.g. well-being as understood by community members).

Enable communities to avoid NELD as a negative side effect of adaptation

Where an adaptation pathway creates the risk of NELD becoming a negative side effect, actions should be taken that enable communities to buffer against those side effects. Because many NELD items relate to lost agency (see Section 3.2.1), actions preventing

negative side effects of adaptation would bring the benefit of preserving the self-determination of communities and potentially increase their resilience.

Assess efficacy of actions to avoid NELD and share good practice

Actions taken to prevent NELD – both as a consequence of climate change and as a consequence of adaptation – should be assessed following implementation. Results should be made public on a central, user-friendly platform. In particular, good practices should be made visible. Based on further conceptual work, descriptions should be provided that facilitate replication.

Reactive pathway (actual incurred NELD):

Establish central independent body to receive NELD claims

An ideal framework would see the creation of a central independent body that would be the central body to receive NELD claims. In accordance with agreed assessment rules, the body would be responsible for recognising claims as NELD and would handle them according to the responses that would have been previously agreed as being adequate by the international community.

Accept members of the public as actors experiencing NELD

The central independent body would recognise claims posed by individuals, communities as well as nation states. This would be in recognition of the fact that NELD are experienced by different communities in different ways, and such recognition would guard against the misrepresentation of communities through national governments. This element could lean on the Aarhus Convention, which allows members of the public to communicate concerns about a national government's compliance in granting access to information, public participation in decision-making and access to justice in environmental matters (United Nations Economic Commission for Europe, 1998).

5.2 Policy recommendations at the national level

Given that NELD – as part of the wider loss and damage discourse – is a political concept from within the UNFCCC, the design of policies addressing NELD at the national level may depend on, and follow, decisions made at the international level. However, the task of raising awareness and increasing the evidence-base on NELD can equally be addressed at the national level. Recommendations for measures *avoiding* NELD can be made at this early stage, as they effectively apply to adaptation planning and implementation at the national level.

Engage in the communication of NELD, and involving communities

Raising general awareness of NELD among the public is likely to trigger positive effects in terms of research and policy action: the more awareness of – and focus on – NELD in the climate change debate, the more research that may follow, and the greater the sensitivity of decision-makers. Leaders from both developed and developing countries should engage in

raising awareness about the losses and damages experienced in different regions. Involving community representatives from vulnerable regions, for example through focussed media activities, is key to reflecting the many facets of NELD.

Promote capacity-building in climate-impact sciences, including in the natural and social sciences in developing countries

Most climate-impact assessments (which form the basis of loss and damage assessments) originate in developed countries, and impact metrics implicitly reflect their – rather than universal – realities and values. Recently, the Network of African Science Academies stated that, “[c]urrent research does not always respond to [African] national knowledge gaps on climate change due to the emphasis on foreign-led studies that respond to international research interests and agendas” (Network of African Science Academies, 2015, p. 34). Indicators or metrics of loss, specifically in developing countries, are largely lacking and underrepresented in climate-impact and risk-assessments. Skilled researchers are needed to work with communities and ensure that specific findings are adequately translated from regional or local contexts into the international research discourse, as for example in the IPCC. This task will not be concluded within a few years but will require continued support. In concrete terms, this will require funding to support participation in international conferences and workshops, which are needed in addition to current research funding.

Integrate NELD in vulnerability assessments and preventive adaptation planning (avoiding NELD)

Integrating NELD into risk- and vulnerability assessments needs to become standard practice if NELD is to be integrated into measures that help to avoid the risk of loss and damage. Assessments should reflect values rather than only commodities at risk and be context-specific. As indicated by the assessment of valuation methods in this discussion paper, methods for such assessments ought to be carefully chosen. The choice of valuation methods should consider what goal the information will serve. In order to reflect the context-dependence of values, the planning and implementation of adaptation measures need to be adapted to context.

6 Conclusion

Although the literature explicitly addressing NELD is scarce, there is much knowledge directly relevant to the field of NELD, for instance on cultural change and environmental values. This became apparent at a “NELD expert workshop” hosted by the German Development Institute in August 2013: roughly three-quarters of some 40 participants identified as not having explicitly worked on NELD before, yet they considered their work as being relevant to NELD. This illustrates the considerable potential for synthesising existing knowledge relevant to different types of NELD and ways to address them.

An overview of items currently listed as NELD indicates a lack of conceptual clarity. The framework presented in this report integrates a set of highly diverse NELD and supports a systematic approach for addressing NELD. Further, understanding the different value dimensions of NELD items – and how the material and non-material spheres relate to one another – will help in identifying appropriate approaches to losses that have been

experienced. Losses of instrumental values will likely require different responses than those to losses of intrinsic values, which are often deemed irreplaceable.

Systematically integrating NELD into research and policy-making on climate change would have a bearing on both the mitigation and adaptation agendas. Including NELD into cost estimates of climate impacts would increase the benefits of mitigation and effectively correct current cost-benefit analyses. Adaptation may offer another opportunity to avoid NELD, provided it is included in the assessment of risks that adaptation measures aim to minimise. At the same time, accounting for NELD brings into focus the negative consequences of adaptation, which could lead to a re-evaluation of its effectiveness.

Finally, NELD need to be addressed under the umbrella of approaches to unavoidable loss and damage. Determining adequate approaches to unavoided losses will not be easy, particularly in an international setting. Context-dependent values will need to be accounted for in a universally applicable way. Where those values are considered incommensurable, means other than monetary assessments will need to be relied on. Approaches to address losses of incommensurable values thus need to be identified.

A number of important research questions remain. Firstly, the limits of available knowledge need to be understood. For example, insights gained from the valuation of ecosystem services can provide a solid information base for values at the interface of societies and their natural surroundings. However, in contrast to ecosystem services, NELD items such as social cohesion and cultural identity are strongly inter-personal. It is not yet clear to what extent insights into the loss of ecosystem services are related to losses at the social and cultural level. Interdisciplinary dialogue between the social and humanist sciences could shed light on the potential limits to the transferability of knowledge, and at the same time contribute to sensitising social constructivist accounts to environmental drivers of cultural change and human well-being.

Another important question that remains to be addressed is that of attributing NELD to anthropogenic climate change. This poses both the problem of attribution and the related problem of timescales at which changes occur. Much of the existing evidence on NELD is associated with extreme events rather than slow-onset climate changes, such as sea-level rise or desertification. Ways to measure and record NELD in relation to slow-onset events will likely require novel approaches. Attribution of NELD to anthropogenic climate change, in particular, will require strong interdisciplinary cooperation and discussions on the distinctions between cultural change and NELD that are associated with anthropogenic climate change.

Although these questions will take time to address, the policy process on loss and damage – and by extension NELD – is already under way. A broad and undefined host of policy instruments and approaches addressing NELD is currently being discussed. This situation presents an excellent window of opportunity for the research community to further distil available insights and lessons learnt into actionable policy recommendations and to support the identification and development of effective and adequate ways of addressing NELD so as to ensure they will not remain the forgotten side of climate impacts.

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