



DISCUSSION PAPER

Non-Economic Loss And Damage

With Case Examples from Tanzania, Ethiopia, El Salvador
and Bangladesh

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Content

Editorial	5	Ways of addressing and/or minimizing NELD	28
		Discussion	28
Executive summary	6	Conclusion	29
Introduction	7	Cases of non-economic loss and damage in Ethiopia	30
Non-economic loss and damage under the UNFCCC and the Warsaw International Mechanism	9	Research area and context	30
The wider context: How the issue of loss and damage has evolved in climate talks	9	Interviews and focal group discussions	31
NELs - so far on the fringes of climate talks but slowly gaining momentum	10	Causal climate events and additional triggers	31
First milestone: Technical paper on non-economic losses commissioned (2012)	11	Cases of climate-induced non-economic loss and damage	31
WIM created (2013) and NELs approved as action area 4 in WIM workplan (2014)	11	Discussion	33
WIM anchored in PA with a mandate to continue to work on NELs (2015), workplan enhanced, first side event and expert group formed (2016)	12	What their coping strategies are	33
		Ways of addressing and/or minimizing NELD	34
		Conclusion	34
The challenging concept of non-economic loss and damage	14	Cases of non-economic loss and damage in Central America	35
Challenge 1: Loss and damage that cannot be expressed in monetary terms	15	Research area and context	35
Challenge 2: Incommensurability of value	15	Interviews and focal group discussions	35
Challenge 3: Context-dependency of value	15	Climate change-induced non-economic loss and damage	36
Challenge 4: Direct and indirect losses	16	Droughts	36
Challenge 5: Associability with climate change	16	Floods	37
Challenge 6: Preventability of NELD	17	Conclusion	37
Main types of non-economic losses	17	Cases of non-economic loss and damage in Bangladesh	40
Interim conclusion	19	Research area and context	40
Towards a registry - A NELD community-level research and assessment approach	21	Interviews and focal group discussions	40
Introduction	21	Climate change-induced non-economic loss and damage	40
The purpose of our field reports	21	The case of Amina Khatun	42
The qualitative and semi-quantitative assessment method chosen for our field reports	22	The case of Karim Gazi	42
Research areas	22	Conclusion and recommendations	42
Types of NELD covered	22	Climate-induced migration: Loss and damage leading to a means of last resort	43
Measurement and valuation of NELD	22	Lessons learnt and policy recommendations: How to deal with NELD	46
Research methodology	22	Elements and milestones for a roadmap to understand, minimize, and address NELD	46
Cases of non-economic loss and damage in Tanzania	24	List of tables and figures	49
Research area and context	24	List of abbreviations	50
Interviews and focal group discussions	24	Bibliography	51
Causal climate events and additional triggers	24		
Cases of climate-induced non-economic loss and damage	24		
Coping strategies	28		

Editorial

The poorest people in the world are at the forefront of climate change. Despite not contributing to the cause, they are already experiencing the disastrous impacts on their lives and livelihoods.

Altered weather patterns and extreme weather events are drastically affecting the lives of millions of people. Slow-onset events such as rising sea levels or melting glaciers are as harmful for the poorest populations as sudden, extreme events such as storms, droughts, and floods.

Climate change is already a terrible reality in some regions of the world. Hurricane Irma made it into the world news for the massive destruction it left in its wake. As a category 5 hurricane, Irma belongs to the most intense super storms: at its peak, Irma sustained 185 mph winds. The economic cost of Hurricane Irma could reach 300 billion dollars. The storm lashed Florida, damaging homes, businesses, and key crops including orange groves, say insurance experts. The death toll of Irma was still 69, despite the monster storm being forecast.

Around the same time, huge parts of Asia were hit by extreme flooding. The death toll in South Asia is estimated at 1,200 after weeks of unusually strong monsoon rains in India, Bangladesh, and Nepal. The United Nations puts the total number of people affected by floods and landslides at 41 million.

While the climate-related economic costs of loss and damage are discussed and also addressed by the G20 groups

through support for climate risk insurance for poor people, non-economic loss and damage hardly gets a mention.

Marginalized, vulnerable, and poor people are affected by climate change in various ways. Financial help may get them back on their feet but it is not enough to truly remedy their suffering. The loss of lives, land, territory, language, and culture can't be valued in monetary terms.

It is critically important to pay attention to this aspect of climate-induced loss and damage. As faith-based groups, we intend to foster discussions on non-economic loss and damage caused by climate change, and to ensure that the voices of the most vulnerable are heard.

This publication discusses various aspects of non-economic losses, and makes recommendations as to how decision-makers could approach this pertinent issue.

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Executive summary

This discussion paper demonstrates that climate-induced non-economic loss and damage (NELD) includes forms of damage that cannot be measured or compensated financially. It includes loss of biodiversity and ecosystem services, land, territories, artefacts, life, health, knowledge, social cohesion, identity, and sovereignty, and it ultimately causes migration and displacement.

NELD is a relatively new concept and very little academic research has been conducted on it until now. Thus, there are still many questions that need to be answered, not to mention a lack of knowledge and gaps in the data. This paper introduces the concept of NELD and discusses its main aspects as well as the key challenges related to it. These include the incommensurability and context-dependency of value, measurements that go beyond market prices, the difficulty of attributing loss to climate change, preventability, the multi-causality of NELD, and the interdependency of various types of loss.

NELD emerged a few years ago within climate policy discourse. This paper provides an overview of how NELD has evolved in the course of the UNFCCC negotiations, and discusses the current mandate of the Warsaw International Mechanism for Loss and Damage (WIM) to minimize and address NELD. In addition, it also discusses the closely intertwined relationship between the work of the WIM on NELD and climate-induced migration and displacement as a last resort or an ultimate consequence of NELD.

Four case reports, based on community-level research, illustrate NELD and how it can affect people's lives and livelihoods as well as their social, cultural and natural environment. They also demonstrate that NELD has not only been overlooked for a long time by researchers and policymakers, but also by development practitioners and the affected communities themselves. Acknowledging and recognizing NELD is essential not only to minimize and address NELD, but also to bring justice to the people it affects.

This paper also emphasizes the strong normative dimension of NELD, which is closely related to fundamental aspects of climate justice. It also analyzes WIM's NELD work plan and argues that a first step would involve addressing these concerns. This needs to be followed up by acknowledging, mapping, registering, and managing the risk of NELD in a manner that provides justice to the people affected.

The development of a NELD registry is discussed as an important milestone in any future NELD roadmap.

Moreover, this paper describes the lessons learned regarding the community based method that enabled NELD to be identified, evaluated and registered for the case reports presented below.

The paper concludes with eight policy recommendations directed at WIM and stakeholders at the national level, which built on the main findings and are aimed at better understanding, addressing and minimizing NELD:

1. Encourage and commission further research and stakeholder consultations
2. Acknowledge and recognize non-economic loss
3. Develop NELD registries with similar procedural standards under the coordination of the WIM
4. Place a strong focus on displacement and migration in the context of NELD in close cooperation of the WIM Taskforce on Displacement and the WIM Expert Group on NELD
5. Mobilize financing from new sources and oblige major polluters to contribute to a Global Loss and Damage Fund
6. Mainstream NELD by including NELD as a mandatory item in national communications and National Adaptation Plans
7. Address NELD at national and local levels
8. Create a Centre for NELD Research, Documentation and Advice that is jointly run by UNFCCC, UNESCO, UNEP, and UNDP.

Introduction

This discussion paper on Non-Economic Loss and Damage (NELD) in the context of climate change has been commissioned by Bread for the World and is supported by ACT Alliance, the World Conference of Churches (WCC), and the Lutheran World Federation. Climate Action Network (CAN) Tanzania, the Christian Commission for Development in Bangladesh (CCDB), the Ethiopian Evangelical Church Mekane Yesus Development and Social Service Commission (EECMY-DASSC), and Ekalesia Kelisiano Tuvalu (EWKT) have also made valuable contributions.

This array of contributors indicates that NELD is of high concern for faith-based organizations and their partners. This is because people and nature, in their integrity, are at the centre of NELD, with all the intrinsic values which make them unique. They are assets beyond economic valuation, which are worth keeping and should not be lost. NELD obviously has a strong normative and ethical dimension, and is closely related to climate justice, which has always been a main concern for us.

The purpose of this discussion paper is to shed light on NELD, as the forgotten element of the loss and damage associated with climate change. It aims to enhance understanding, and propose ways to minimize and address NELD at different levels.

Until now, there has been very little literature available on NELD. NELD emerged as an issue in climate negotiations only recently (2012), but has already started to gain momentum. This discussion paper includes



In the Ethiopian highlands, farmers have to adapt to shortened rainy seasons due to climate change. Against soil erosion, they are building protective walls and plant trees, which also serve as cattle feed.

findings from community-level research undertaken in different countries. Through this, we aim to bring people's perceptions of NELD to the forefront of the discourse, and help policymakers and experts, including those from the Warsaw International Mechanism on loss and damage, to take informed decisions and move the process forward. The ultimate aim is to bring justice to those affected and minimize NELD in the future.

Having said that, we reiterate that the best strategy to minimize loss and damage is still to mitigate climate change. This would be achieved by switching to zero-carbon development pathways that limit the increase in global temperatures to 1.5°C. Adaptation is the next best option.

To maximize political impact, the discussion paper will be presented at COP23 in Bonn, under Fijian COP presidency, with a view to strengthen the focus on vulnerability, loss and damage and climate resilience at this "Pacific" COP. Secondly, we hope that the case-based evidence of the broad variety of non-economic damage will raise awareness of the urgency and importance of taking robust steps to keep global temperature increases below 1.5°C.

The first chapter provides an overview of how NELD has emerged in international climate negotiations, and assesses the current political challenges. In the second chapter, we deepen the analysis of conceptual challenges and data gaps and touch on important questions around the typology of NELD as well as measuring and valuating it. This leads us to initial policy recommendations that we would like to see on the agenda of the Warsaw International Mechanism (WIM). In the third chapter, we argue that a NELD registry needs to be developed. We introduce our own NELD community-level assessment approach, followed by short reports on selected case studies from Tanzania, Ethiopia, El Salvador, and Bangladesh. These case reports have been elaborated by local researchers, in cooperation with development field workers from our organizations and their local partners. Due to the limited scale and scope of the research, the results are not representative and therefore should not be generalized. They indicate, however, the high relevance of NELD, the need for more in-depth research, the value of registering NELD, and that the NELD typology, measurement and valuation approach has potential to be further developed.

As a next step we analyze the relation between NELD and climate-induced displacement. We conclude with the lessons learnt and eight policy recommendations on how to proceed in relation to NELD.

In terms of terminology, we start by using the abbreviation NELs (non-economic losses), as used in the technical paper of UNFCCC and in WIM discussions. In the following chapters we mostly use the term NELD (non-economic loss and damage), which is used in publications by the German Institute for Development and other think tanks and NGOs. Our preference for the term NELD is maintained for the rest of the publication.

We would like to express our special thanks to the authors of the field reports and their local research teams: Elena Cedillo and LWF Central America (El Salvador), Michiel Hermans, Msololo Onditi and CAN Tanzania, Endeshaw Kassa and ECMY-DESC field workers in Dessie (Ethiopia), and Habib Torikul with Efaz Ahmed and the CCDB field workers in Patharghata, Bangladesh. The full versions of all local-level case reports are available on request.

Non-economic loss and damage under the UNFCCC and the Warsaw International Mechanism

The wider context: How the issue of loss and damage has evolved in climate talks

Non-economic loss and damage is part of the much wider discourse on loss and damage: Climate-related damage and the associated economic costs have been constantly increasing since 1970 and even more so in the last two decades. These trends are scientifically well documented and closely related to both an increase in extreme weather events and long-term changes in climate variables in the context of climate change. In light of these findings and increasing evidence on the ground, governments of particularly vulnerable countries, as well as economic decision-makers, investors, farmers, humanitarian aid agencies and many others started relatively early on to look for ways to better understand, minimize and address climate-induced loss and damage, in order to keep economic costs as low as possible (for more details see Bred for the World 2015).

In stark contrast, it took the international climate policy process, i.e. the negotiations under the United Nations Framework Convention on Climate Change (UNFCCC), considerably longer to begin to accept that “loss and damage isn’t some abstract concept, but the reality of life today for the people who contributed least to the problem”, as

framed by Thoriq Ibrahim, the Maldives environment minister and current chair of the Association of Small Island States (AOSIS) (Reuters, 11th September 2017, <http://news.trust.org/item/20170911050518-qemr3>).

AOSIS filed its first submission on loss and damage back in 1991 during the preparatory phase for the UNFCCC to the United Nations. It called for an insurance pool to compensate the most vulnerable small islands and low-lying developing countries for the loss and damage resulting from a rise in sea levels. However, the call was rejected by developed countries, as were many other pleas in subsequent years, due to their fear of opening the floodgates on legal liability.

For this reason, loss and damage has always remained a contentious issue in climate negotiations. This has meant constant delays in developing an international framework that would have made it possible to build a common policy framework at an early stage to more efficiently and fairly address loss and damage. Instead, the loss and damage issue has increasingly become a highly politicized battlefield of poor versus rich countries, with the result of hindering progress in climate talks. It took the parties to the UNFCCC until their 18th Conference of Parties (COP18) in Doha, Qatar in 2012 to

Year	Event	Milestone
1991	UNFCCC preparations	AOSIS submission on climate risk insurance pool to compensate for L&D
2001	COP7 Marrakech	Decision to consider implementation of insurance-related actions at next COP
2003	UNFCCC workshop Bonn	Workshop on insurance-related actions for the benefit of vulnerable countries
2007	COP13 Bali	First mention of L&D in Bali Action Plan in the adaptation context
2008	Copenhagen preparations	AOSIS submission on establishing Multi-Window-Mechanism on L&D
2010	COP16 Cancun	Decision to establish L&D work program under Cancun Adaptation Framework
2011	COP17 Durban	Refinement of work program on L&D
2012	COP18 Doha	Decision to institutionalize L&D under the UNFCCC at next COP
2013	COP19 Warsaw	Warsaw International Mechanism for L&D established, interim ExCom established to develop initial 2-year workplan
2014	COP20 Lima	2014-2016 workplan of WIM adopted
2015	COP21 Paris	L&D established in PA as an independent pillar in addition to adaptation & mitigation; WIM anchored in PA, ensuring the permanence of the institution
2016	COP22 Marrakech	Indicative rolling 5-year workplan of WIM on L&D adopted
2017	COP23 preparations	Beta version of the WIM clearinghouse on risk transfer developed and WIM taskforce on displacement established

Table 1: Chronology of main loss and damage milestones in the UNFCCC process
Source: Based on Serdeczny/Waters/Chan 2016, p.6, with amendments by Hirsch

decide that they would develop an institutional response to loss and damage. This was finally adopted one year later, at COP19 in Warsaw, Poland as the so called “Warsaw International Mechanism for loss and damage” (WIM). The WIM, which was originally subject to review in 2016, was already reaffirmed in the Paris Agreement (PA) in 2015, and thus became firmly anchored as the durable international policy framework to improve and promote understanding, strengthen dialogue and coherence of approaches, and enhance action and support, including financial support on loss and damage (see *Bread for the World 2016a*). Still, however, it remains rather unclear if the WIM or any other institution under the PA will ever cover the costs associated with loss and damage, and who would pay. Following pressure from developed countries, the COP decision accompanying the PA includes a paragraph explicitly confirming that the PA does not provide any basis for liability or compensation (1/CP.21, para 51). Be this as it may, this does not necessarily legally preclude compensation claims (see *Bread for the World 2016b*, p.12f.). The ongoing debate on holding polluters to account, initiated by civil society, has started to gain momentum, and the first court cases have begun (see for instance the lawsuit Luciano Lliuya against RWE in Germany; information is available at <https://germanwatch.org/en/huaraz>).

Apart from the controversial liability issue, the establishment of the WIM, its embedding in the PA, and the increasingly routinized work of the WIM’s Executive Committee (ExCom; composed of ten members from developing and ten members from developed countries) has significantly contributed to greater acceptance and political recognition of the relevance of loss and damage. The clear mandate provided by COP21 in Paris on the WIM, namely to focus on nine action areas (AA) – in addition to working on climate risk insurance and setting up a clearinghouse for risk transfer – also promotes the stepwise development of a robust international policy framework on loss and damage covering the following issues, to be further developed into a rolling 5-year workplan:

- Particularly vulnerable developing countries, populations, and ecosystems (AA1);
- Comprehensive risk management approaches (AA2);
- Risks and impacts of slow-onset events (AA3);
- Resilience, recovery, and rehabilitation (AA5);
- Migration, displacement, and human mobility (AA6);
- Financial tools and instruments (AA7);

- Complement, draw upon the work of, and involve other bodies (AA8);
- Develop a 5-year rolling workplan (AA9);
- Climate risk insurance and establishing a clearinghouse for risk transfer and non-economic losses (AA4).

While the roadmap of the WIM’s future work on loss and damage is formally settled, there remain challenges and conflicts, as the post-Paris meetings of the WIM ExCom and COP23 in Marrakesh have shown. The main problem areas concern:

- (By far too scarce) resources and modalities as well as capabilities of the work of the WIM;
- The content of work (“either to keep the baby small or to let it grow”, as it was framed by an experienced senior UNFCCC staff);
- The vision for the WIM, which is still under development. The level of ambition of the future WIM vision will also influence the two other problem areas, i.e. modalities/resources and content.

The way these challenges are to be tackled will provide the direction in which the post-Paris global policy framework on loss and damage will be shaped. *Bread for the World*, together with ACT Alliance, World Conference of Churches and Lutheran World Federation, and its national partners and members, will work towards an ambitious and ethical loss and damage framework to provide climate justice and solidarity for those whose lives, livelihoods, ways of living, and environments are threatened by loss and damage due to the adverse impacts of climate change.

NELs - so far on the fringes of climate talks but slowly gaining momentum

Until now, the discourse on loss and damage in UNFCCC negotiations has centred on the question of potential economic costs, monetary compensation, and a form of burden sharing that reflects in one way or another the polluter-pays principle, as we have briefly shown. This focus is also seen in loss and damage narratives, policy demands, legal considerations, possible tools, conceptual and technical expert discussions, and formal and informal negotiations. A broad range of other discussions have emerged around this central question, including on the issues of avoidable and unavoidable economic

loss and damage, assessment methods, comprehensive risk management and enhanced mitigation and adaptation approaches to minimize loss and damage, cost-efficient risk transfer, improved cooperation, and alignment strategies. Discussions have also extended to the extent to which the economic costs of slow-onset events such as rising sea levels, as well as extreme events such as hurricane Irma, can be attributed to anthropogenic climate change, and the extent to which the polluter-pays principle could be applied. These discussions have incorporated a distinct view on historic, current, and future responsibilities.

Non-economic losses, meaning adverse climate impacts that are difficult to measure and quantify (such as the loss of traditional knowledge, cultural heritage, or community social cohesion) or losses that cannot be easily expressed in monetary terms (such as the loss of biodiversity or land fertility) have so far occupied the fringes of the political discourse. They are not yet considered a priority, and are difficult to understand and deal with in the usual normative terms and technical categories of climate diplomacy.

First milestone: Technical paper on non-economic losses commissioned (2012)

The concept of non-economic loss and damage originally emerged not outside but inside climate negotiations, as a result of initial attempts to systematically capture and categorize all forms of climate-induced loss and damage at COP18 in Doha (2012). It was at this time that the term non-economic losses was firstly mentioned in a COP decision.

COP decision 3/CP.18, para 10(b) also commissioned a technical paper with the mandate to:

- Provide the conceptual background on non-economic losses, including how non-economic losses contribute to loss and damage, as well as the total cost of climate change;
- Describe the main types of non-economic losses and the ways in which they materialize;
- Discuss the various assessment techniques available to estimate non-economic losses;
- Indicate what the different assessment techniques imply for the identification of non-economic risks and the design of practical adaptation actions (UNFCCC 2013, p. 3).



The area south-west of Dhaka, Bangladesh, has been heavily devastated by hurricanes in 2007 and 2009. Increased built wells can also be used at high water.

The technical paper published in 2013 placed a special focus on particularly vulnerable developing countries. It is based on a literature review and provides a conceptual background on non-economic loss and damage, a typology, a comparative overview on assessment methods, and some conclusions. This technical paper can still be considered the most detailed and authoritative interpretation of non-economic loss and damage in the UNFCCC policy discourse.

WIM created (2013) and NELs approved as action area 4 in WIM workplan (2014)

The final institutionalization of loss and damage under the UNFCCC, with the establishment of the WIM at COP19 in Warsaw and the approval of the first WIM workplan at COP20 in Lima in 2014, is a further milestone in the short political history of non-economic loss and damage. The workplan formally included non-economic losses as action area 4 (AA4), explicitly tasking the WIM ExCom to:

- Raise awareness of the nature and extent of non-economic losses and 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;
- Establish an expert group to develop inputs and recommendations to enhance data and knowledge of reducing the risk 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 impacts of climate change (ibid, p.8).

WIM anchored in PA with a mandate to continue to work on NELs (2015), workplan enhanced, first side event and expert group formed (2016)

The PA, as pointed out, reaffirmed non-economic loss and damage as a stand-alone action area. Accordingly, the WIM was mandated to continue to work on non-economic loss and damage, leading to its inclusion in the indicative rolling 5-year workplan to build on the first 2014-2016 workplan. This decision was taken at COP22 in Marrakesh in 2016.

Earlier in 2016, a formal WIM working area of non-economic losses (NELs) had been defined, and, as with other working areas, a champion among the members of the ExCom was appointed and tasked with taking the lead. This was an ExCom member from El Salvador, representing Latin America in the WIM.

During the 2016 June Intersessional in Bonn, a first WIM side event on NELs took place, aiming to set the agenda and raise awareness of conceptual and political challenges related to NELs. In fact, the workshop served more to introduce the challenges than to propose ways to close the gaps in minimizing and addressing NELs (see WIM 2016a).

Also in 2016, an expert group on non-economic loss and damage was formed, consisting of 11 experts (as of January 2017), including three members of the WIM ExCom and eight independent experts from UN organizations, academia, humanitarian organizations, and one

NGO representative from the International Alliance of Indigenous and Tribal Peoples of Tropical Forests.¹

The expert group reports to the WIM ExCom and is tasked with assisting in developing inputs and recommendations to enhance data and knowledge on non-economic losses. In its first meeting, held in September 2016, the group elaborated a workplan to be implemented by the end of 2017 (WIM 2016b). According to this workplan, the expert group plans to deliver on raising awareness on NELs (e.g. developing narratives and an awareness-raising strategy), knowledge gathering (e.g. literature reviews, workshops, and case studies), and mainstreaming knowledge into planning (e.g. analyzing assessment methodologies and preparing for a study on how to best minimize and address NELs at all planning levels from local to global).

The workplan illustrates that the WIM work on NELs is in the very initial stages, and that the main goals are knowledge enhancement and agenda setting. It also reflects the purpose of the WIM to serve as a coordinating node to gather, assess, and provide knowledge, as well as to encourage action and cooperation, rather than to plan for and implement activities to minimize and address NELs.

In conclusion, after being neglected in the UNFCCC process for many years, NELs have slowly but surely gained momentum since 2012, when the issue emerged for the first time at a COP. First considered only in the form of a technical paper, in the work program on loss and damage, NELs has become a stand-alone action area in the newly established WIM, with its own expert group and workplan. Mandated by the PA, NELs has the potential to gain further momentum in the international policy arena. Knowledge gathering, including through case studies, and subsequently raising awareness on NELs, will probably remain the key priorities in the years to come. After this, building on the lessons learnt and good practice examples, the focus should shift to systematically mainstreaming NELs in climate and development planning, be it NDCs, long-term strategies, SDG implementation plans, national disaster risk management, or other planning processes from the local to the international level, with a view to minimizing NELs and

¹ — The member list of the expert group, their terms of reference, and the summary of proceedings from the first meeting can be found here: www.unfccc.int/adaptation/groups_committees/loss_and_damage_executive_committee/items/9694.php

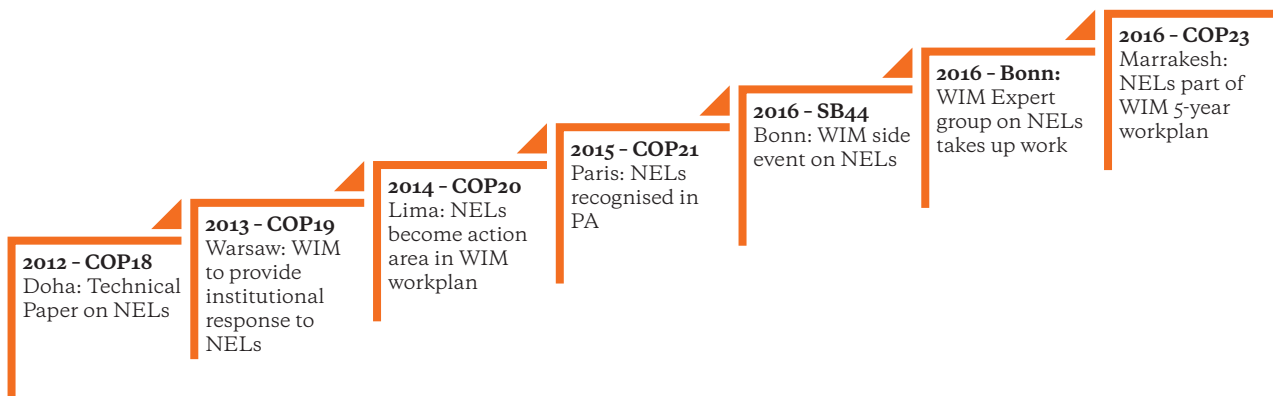


Figure 1: NELs milestones in the UNFCCC process
 Author: T. Hirsch

finding ways of addressing unavoidable NELs, be it by means of recognition or a form of compensation.

It is vital for success that the WIM and its expert group, but also the parties to the PA and observers in climate talks, ensure the necessary level of vision, ambition, and resources at this early and critical stage of the WIM process on NELs, so as to enable the NELs discourse to grow and, ultimately, deliver as mandated.

NELs usually overlap and interlink with other types of loss and damage in real life, as we will see in the following chapters. Thus, the WIM action area of NELs is also closely related to other action areas. This is particularly true for action area 6 on migration, displacement, and human mobility, since human mobility – with displacement as its most extreme form – is considered a potential case of NELs (see UNFCCC 2013 p. 22ff.). Accordingly, it is politically important to observe the proceedings of the respective WIM action areas and how they are coordinated with the NELs action area. In Paris at COP21, it was decided, with regard to the WIM workplan, to prioritize (by setting a specific timeline), among others, the formation of a taskforce on displacement. Therefore, the WIM ExCom, at its fourth meeting in September 2016, adopted the respective terms of reference, and set up the Taskforce on Displacement, which met for the first time in May 2017. At this meeting, the fourteen members of the taskforce – including four members of the WIM ExCom

and ten independent experts, mostly from UN organizations but also from NGOs – agreed on a 2017-2018 workplan, which aims to analyze existing national and international policies and institutional frameworks and assess the extent to which they minimize or address displacement; gather knowledge on main drivers for climate-induced displacement related to slow-onset events; provide an overview of the main data sources on displacement; and convene, if appropriate, stakeholder consultations. A report with policy recommendations is expected to be ready for the first meeting of the WIM ExCom in 2018. The work of the taskforce is highly relevant in terms of enhancing understanding of NELs.² Results should therefore be regularly shared with the NELs expert group, and the work synchronized as much as possible.

The lessons learnt from the community-based case reports will facilitate concluding recommendations that are deeply rooted in local experience.

² – Further information on the Taskforce on Displacement, including workplans and summaries of proceedings, can be downloaded from the UNFCCC website www.unfccc.int/adaptation/groups/committees/loss_and_damage_executive_committee/items/9978.php

The challenging concept of non-economic loss and damage

As climate change affects a wide range of social, economic, and environmental systems, the possible loss and damage is very diverse.

The extent to which climate risks increase the probability of loss and damage depends on various factors. The baseline risk results from geographical exposure to climate hazards and the vulnerability of the individual, the community, or the country. The climate hazard component of risk exposure increases (in the medium and long term) with the level of global warming, and can be reduced by greenhouse gas mitigation. Therefore, mitigation is the first priority in averting or minimizing loss and damage.

Vulnerability is highly dependent on socio-economic factors, as well as the environmental integrity and the level of risk-management measures taken. A high level of human development, a sound environment, robust infrastructure, and well-elaborated risk management measures increase the resilience of an individual, community or country, and also reduce vulnerability to climate hazards. By taking adaptation measures, vulnerability can be reduced, and loss and damage minimized. Therefore, adaptation is the second priority in averting or minimizing loss and damage.

The un-avoided or unavoidable residual risk that can be attributed to climate change – beyond mitigation and adaptation action or capacity – leads to loss and damage (see UNFCCC 2013, p. 9ff.). “Addressing loss and damage”

is considered by climate negotiators to be a technical term for taking measures that lead, in one way or another, to compensation for those individuals, communities, or countries that have suffered loss and damage.

Less effective mitigation action results in higher adaptation costs; higher remaining emissions and a wider climate risk gap, due to insufficient action, results in higher remaining loss and damage. This impact chain makes it very clear how important it is to take ambitious mitigation and adaptation action from the start, in order to keep loss and damage low. Addressing – i.e. compensating for – loss and damage is the last resort.

From a climate justice perspective, it is important to note that those individuals, communities, and countries who tend to suffer the most from loss and damage, due to their high vulnerability combined with high levels of exposure to hazards, are usually also those who contributed the least to the problem. Accordingly, it is a fundamental matter of justice to put the polluter-pays principle into practice. The problem needs to be tackled at the source by avoiding emissions and adaptation of climate-vulnerable countries should be supported – both financially and through technology transfer – by the rich or those who historically contributed the most to the problem.

Spending more on mitigation and adaptation reduces the cost of loss and damage. But who pays? If we invert this: Side-stepping mitigation and adaptation

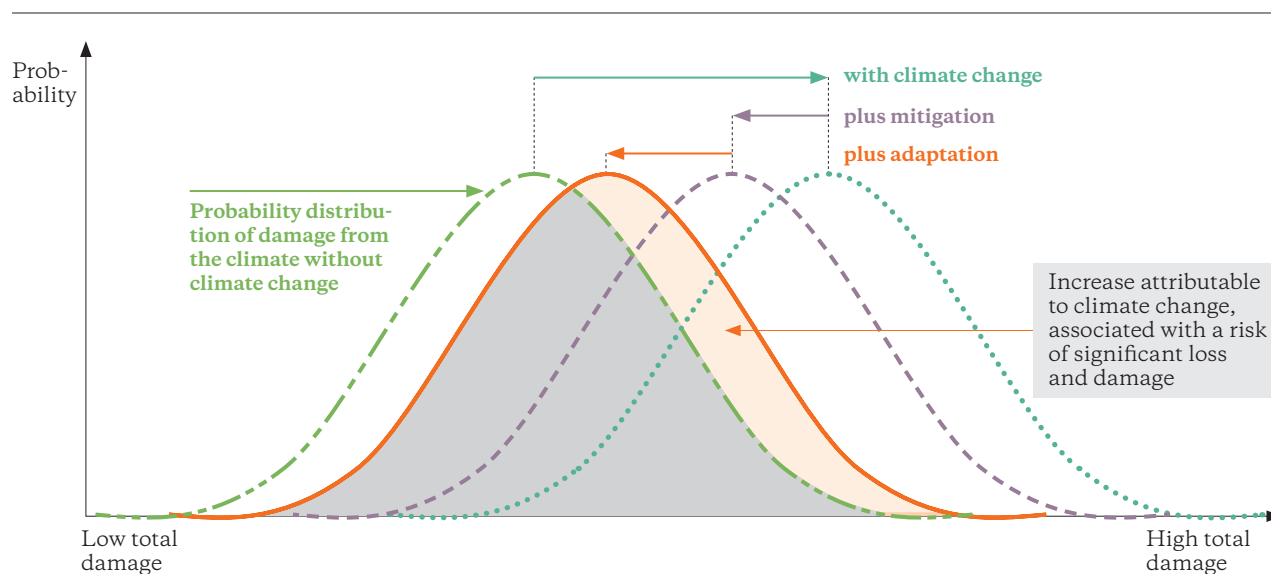


Figure 2: Risk profile and cost curves for mitigation, adaptation and loss and damage
Source: UNFCCC 2013 p. 10

costs - or investments - relieves the greater polluters and richer countries of climate-related costs, and overburdens the poor and vulnerable with loss and damage.

Challenge 1: Loss and damage that cannot be expressed in monetary terms

As politically challenging the answer to the question “who pays what” and “who compensates for loss and damage” may be, it is even more challenging to address loss and damage that cannot be valued in monetary terms or that has no economic market price, for instance the loss of biodiversity, life, health, culture, identity or social cohesion, to name just a few. How can policymakers then address such non-economic loss and damage (NELD) adequately? And, how can they adequately deal with the loss of intrinsic value (i.e. something that is valuable for what it is, for instance a living species) compared with instrumental value, which serves a particular purpose that can be valued, for example food, which has the instrumental value of maintaining health.

It is worth mentioning that the term “non-economic”, from the perspective of a subsistence farmer, honey collector, or fisherman in Ethiopia, Tanzania, or Bangladesh, may be a misleading description of the kind of loss and damage we are discussing. Material losses of land fertility or biodiversity for people whose livelihoods heavily depend on fertile land and ecosystem services, as well as traditional knowledge of nature and weather patterns, are of great economic value. They don’t trade their goods on the market, and money may play a minor role for the subsistence economy they practice. But it is still an economy and the loss of soil or biodiversity matters very much to them in their economic terms. Thus, the term “non-economic loss and damage”, despite being used in this study since there are no alternatives yet, should be used with caution, in particular when it comes to discussions at community level.

Challenge 2: Incommensurability of value

It is one of the characteristics of NELD that its value is regarded as incommensurable (German Development Institute 2016), for example the loss of artefacts, identity, or biodiversity, or any other items with a value that cannot be monetarized or quantified.

Incommensurability is not the same as incomparability: Incommensurable items cannot be measured in

terms of their value, but still might be comparable, for instance on a priority list - as long as there is one common point of reference against which items can be compared (ibid). One possible reference point could be the value of incommensurable items for communal wellbeing. As we will see in some of the case studies, the loss of social cohesion within a community due to worsening climate conditions, which negative effects people’s livelihoods, is considered a very severe loss. Even if it cannot be measured in monetary terms, it is still possible to compare this NELD with other forms of loss and damage, for instance in a scoring list. That is an important finding, countering the argument that NELD that cannot be monetarized cannot be addressed.

This leads us to another challenge: How can incommensurable NELD that cannot be replaced still be addressed? Apart from the possible option of monetary compensation (a loss of life, despite of being incommensurable, is compensated in monetary terms through life insurance or other forms of indemnity), it is important to note that the recognition or mere acknowledgement of a loss is an important step in helping those who are affected, and who often feel left behind. This notion is strongly supported by the lessons that can be taken from the focal group discussions in our case studies presented below. There are clearly no easy answers as to how to deal with incommensurable NELD - but there are options, as we have seen. The NELD expert group of the WIM should further investigate research findings, and consult anthropologists and psychologists with expertise in trauma counselling.

Challenge 3: Context-dependency of value

NELD is often highly context-dependent, with culture, social factors, and livelihoods being the main context-related factors. This means that the specific value of individual NELD can vary widely depending on the context. This can be illustrated with some of our case findings. The climate-induced loss of certain bird species is described in the Tanzanian case as a very valuable loss, since with the birds, the community lost a traditionally very important means of predicting rainfall patterns, and thus the right time to sow seeds. The same loss of birds elsewhere might have been much less relevant.

In the case of Tuvalu, the loss of land, or territory, is the main fear, and closely related to the question of cultural identity. Land is scarce, and at acute risk of being

washed away due to rising sea levels. If the land goes, people will have to migrate. And they are worried that this will mean losing their culture - and with their culture, their identity. This is considered such a huge potential loss that even teenagers wonder whether it is better to die than to leave.

Context dependency is a particular problem if those who register, assess, or value the loss are not familiar with the context. This will be challenging for the WIM as well, if its expert group has to acknowledge or collect information on cases of NELD, or develop standards for what could count as NELD. If a standardized NELD registry is to be established in the future, there is a high risk that context dependency will leave many NELD cases unaccounted for and not recognized. A bottom-up approach to NELD registries will reduce the risk of overlooking cases of NELD. The difficulty of combining countless registries, possibly based on very different standards (to maintain the sensitivity toward different contexts), remains and gives rise to further methodological research questions (see also Serdeczny/Waters/Chan 2016, p. 21, UNFCCC 2013, p.16ff.).

Challenge 4: Direct and indirect losses

We have seen that NELD is always mediated by a societal context that shapes vulnerability to climate impact. That makes NELD highly context-dependent and thus leads to many losses that are of an indirect nature. While a direct loss occurs when valuable items are directly destroyed, for example soil and sweet water through salinization caused by rising sea levels or in the wake of a cyclone, an indirect loss may occur in form of increased incidences of skin diseases as a result of people in coastal areas of Bangladesh forced to wash with saltwater because of a scarcity of sweet water due to salinization. Similarly, cyclone SIDR (Bangladesh, 2007) has triggered migration (mediating process), leading to a loss of social cohesion, traditional knowledge, and identity in the remaining communities (mainly women, children, and old people), who became trapped in poverty, and too weak to migrate. These non-economic losses then mediated further problems, that can be categorized as NELD, such as severe mental health issues (for more examples see the case studies in this paper or Serdeczny/Waters/Chan 2016, p.3).

These examples show how complex it can be to attribute indirect NELD to events that were triggered by climate change. Moreover, most impacts are multi-causal.

Migration, to take this example up again, often results from an interplay of climate and non-climate factors. Ground research conducted by the Center for Participatory Research and Development (CPRD) in Bangladesh in the three southwestern coastal districts found that there are usually many push and pull factors in people leaving their homes, but that climate change is the main stressor (see CPRD 2015).

Here the complexity of NELD again becomes clear, posing many critical questions that have a strong normative dimension (German Development Institute 2016): Which losses count? How can they be identified? Which of these losses are considered deplorable but acceptable by the international community engaged in climate negotiations or, more specifically, in the WIM? Which, in turn, are considered unacceptable? And how best to react to this? So far, there are many questions, but few or no answers. The NELD expert group of the WIM should further look into these questions and consult stakeholders, including representatives of those affected, about appropriate ways to proceed.

Challenge 5: Associability with climate change

There is empirical evidence of global warming, the increase in extreme weather events, and long-term changes in climate parameters such as precipitation. There is also no serious scientific doubt that these changes can be associated with climate change (IPCC 2014). Having said this, however, there is still significant uncertainty about how far a single extreme event, for example cyclone SIDR, can be attributed to anthropogenic climate change, or if SIDR just was another “normal” cyclone. The same question applies to hurricane Irma in 2017, an extremely catastrophic hurricane, on the back of hurricane Harvey, which also wrought massive damage. To what extent can their intensity be attributed to anthropogenic climate change? Since there is no baseline defined for “climate normal hazards”, the difference attributable to climate change cannot be measured.

Apart from this difficulty in attributing a single event to anthropogenic climate change, there is the second challenge of attributing the level of resulting damage to climate change. Usually, at least some of the damage is also attributable to non-compliance with, for instance, building codes applicable to areas threatened by floods (see Bread for the World et al. 2015, p.11)

In the case of NELD, dealing with indirect and non-material losses such as loss of culture or social cohesion, clearly attributing such losses to anthropogenic climate change is even more complex. As rightly pointed out by Serdeczny, Waters, and Chan (2016, p.3), there is a high risk that claims for justice in the case of a loss of culture or identity will be countered by the argument that cultural change is a ubiquitous part of life - and hence has to be accepted. While evolutionary or “usual” cultural change brings a lot of benefits alongside the hardship, this is clearly not the case for those affected by NELD. They rarely have access to the benefits of fossil fuel combustion (as the primary driver of climate change), but suffer as a result of the consequences. This may raise, again, the question of whether an equitable approach would be to work towards a compensation scheme in which major polluters are obliged to compensate for the damage, for instance through a global carbon tax.

Challenge 6: Preventability of NELD

Another challenge is related to the question of if and how to distinguish between unavoidable NELD and NELD that occurred but could have been prevented, or at least minimized, through the right adaptation measures. Does this difference puts claims for justice - or compensation - in a different position? Does NELD that might have been avoided preclude compensation? If so, how should this be proved, and who decides?

Some argue that loss and damage, including NELD, falls into the category of climate costs (or burdens) that go beyond adaptation capacity. This might be a politically pragmatic distinction, but it overlooks that loss and damage, and NELD in particular, is more a continuum than a single event, and that it could at least be minimized by taking more ambitious adaptation action, for instance by building higher dams or fortifying houses.

In this respect, the political approach taken in the UNFCCC debate, and by the WIM (see previous chapter) – to call for loss and damage to be minimized before focusing on addressing the residual loss and damage – seems to be generally appropriate as long as it doesn’t overburden those who are too vulnerable to take adaptation measures, or who are left alone without the support they desire and deserve.

A particular NELD challenge is, again, related to incommensurability. What if a graveyard or a place of worship on a low-lying atoll could theoretically be protected



In Bangladesh Karim Gazi has lost his house for the fifth time due to river erosion. He and his family had to rebuilt it on different spots of land.

against rising sea levels, at least for twenty more years, but only at a very high financial cost? What if the cost-benefit analysis, assessing the value of the atoll only in economic terms, comes to the conclusion that it is simply not worth it because the intrinsic value of the graveyard or the cult site cannot be factored into a monetary cost-benefit analysis? Questions like this are highly relevant for the people concerned, and they are not abstract but very real. Islanders from the Carteret Islands (PNG), Kiribati, or Tuvalu, to name but a few, are confronted with these problems, and the international community has by and large been unable to provide answers or lasting solutions (see Bread for the World et al. 2015).

Main types of non-economic losses

NELD can be systematically categorized into different types. The previously mentioned technical paper written by Frankhauser et al. at the request of the UNFCCC in 2013 (UNFCCC 2013, see previous chapter) includes eight main categories: Loss of life, health, human mobility, territory, cultural heritage, indigenous and traditional

knowledge and other social capital, biodiversity, and ecosystem services (ibid, p. 22ff.).

Morrissey and Oliver Smith (2013) suggest eleven types, with two falling in between economic and non-economic losses, and a more specific differentiation of socio-cultural NELD. Meanwhile, Andrei et al. (2015) leave it at six broader categories.

Serdeczny/Waters/Chan (2016, p. 12ff.), building on an analysis of these typologies, present another conceptual framework, placing the categories into a matrix with four different domains of NELD, namely the material-intrinsic domain, the material-instrumental domain, the non-material-intrinsic, and the non-material-instrumental domain (see figure 3).

For the purpose of our field reports, we have developed our own categorization, which is very similar to that proposed by Serdeczny/Waters/Chan and the UNFCCC technical paper. Following Serdeczny/Waters/Chan, we

have considered human mobility more a consequence of NELD – e.g. as a consequence of lacking human security, of lost livelihoods (for instance loss of productive land), or of lost territory – than NELD itself. The UNFCCC technical paper, by contrast, keeps human mobility as its own NELD category.

For our research, we have chosen the following main types of NELD.

Material non-economic loss and damage

- **Human life:** Loss of life is clearly NELD, as it is a violation of the right to life.
- **Biodiversity & ecosystem services:** Living organisms have intrinsic value and species have a right to exist; ecosystems provide many services such as food and water, aesthetics, culturally valuable items, and regulating services.

	Intrinsic	Instrumental
material	<p>Biodiversity Biodiversity/species Biodiversity loss</p> <p>Human Life Loss of life</p> <p>Places Loss of culturally important landscapes Territory Habitat destruction (homes)</p> <p>Artefacts Destruction of cultural sites Cultural heritage</p>	<p>Production Sites Loss of productive land</p> <p>Cummunal Sites Habitat destruction (markets, religious sites)</p> <p>Ecosystem Services Ecosystem services</p>
non-material	<p>Intrinsic Values Dignity (human mobility) Intrinsic value of biodiversity Physical and mental well-being</p>	<p>Agency Social cohesion, peacefully functioning society Security (human mobility) Adverse health impact Physical and mental well-being Ability to solve problems collectively Ecosystem services Sovereignty (territory) Health Education</p> <p>Identity (knowing/belonging) Traditions/religion/customs Loss of knowledge/ways of thinking Decline of (indigenous) knowledge Indigenous and local knowledge Loss of indentity, social bonds/relations Sense of place (territory)</p>

Figure 3: A conceptual framework for categorizing the main types of non-economic loss and damage
Source: Serdeczny/Waters/Chan 2016, p.13

- **Productive land:** Land and other natural production sites, such as fishing grounds or forests, are natural habitats and, at the same time, an important source of livelihood; due to their tremendous importance for human wellbeing, fertility (of land) is of high cultural and social value in many cultures, in particular indigenous cultures.
- **Territory** has non-economic value, as it provides identity, space, and sovereignty.
- **Artefacts** are material manifestations of cultural, including religious, heritage.
- **Others:** Residual category.

Non-material non-economic loss and damage

- **Traditional knowledge** can be unique and has practical, cultural, and social value.
- **Social cohesion** is a prerequisite to cooperation, human security, and peace.
- **Dignity/sovereignty** expresses enjoyment of human rights, wellbeing, and independence.
- **Identity/home** is associated with the notion of knowing and belonging, providing orientation and freedom.
- **Physical/mental health** are intrinsic values and fundamental human rights.
- **Others:** residual category.

The researchers concluded that these types functioned well, and that nothing important has failed to be covered by them. They also concluded that local people sometimes found it difficult to distinguish between some of them, for example “land” and “territory”, or “identity” and “home”. In future research, the number of main types may therefore be further reduced. It was also clear that the distinction between “intrinsic” and “instrumental” is not always clear and that it is context-dependent (“biodiversity”, for example, could fall into both categories). The differentiation between “material” and “non-material” NELD, on the other hand, triggered a very rich discussion once it was explained to the communities: Some even called it an “eye-opener”. People started to explore the manifold ways in which climate change impacts the non-material aspect of their life, e.g. social cohesion, values, identity, mental health. The lesson learnt was that people tend to focus very much on material loss and damage when considering the impact of climate change; the non-material side risks being overlooked if it is not addressed appropriately, including by the WIM.

Interim conclusion

Non-economic loss and damage provides a lot of challenges, in addition to the general challenges associated with loss and damage. The following specific NELD challenges have been discussed in this chapter, and there are knowledge and data gaps with regard to all of them: Uncertainty as to how to express or compensate for NELD in monetary terms, incommensurability of value, context-dependency of value, uncertainty as to how to identify indirect non-economic losses, difficulty in clearly attributing NELD to climate change, and possible implications of NELD that occurred despite its theoretical preventability.

These are challenges in terms of:

- research to close knowledge gaps and improve understanding of NELD;
- developing assessment methods leading to a standardized system of NELD registries;
- communicating NELD properly and raising public awareness of its implications;
- how best, at the level of political decision-making, to implement the Paris Agreement and the WIM mandate, which call on stakeholders to minimize NELD and to address residual NELD.

With regard to the WIM mandate and its political objectives, it is important to reiterate that assessing for NELD, due to its character and the challenges described above, has a strong normative aspect, encompassing ethical, human-rights, and climate-justice elements. As we have shown in the discussion on main types of NELD, it is notable how closely some, if not all, are related to human and environmental rights. If NELD occurs, a human rights perspective should always be applied in order to find out if human rights have been violated, and if states, individuals, or businesses have failed to meet their human rights obligations or responsibilities, either directly or indirectly. If this seems to be the case, human rights instruments or legal frameworks could be used to bring justice to those whose rights have been violated. This could be one way to address NELD.

It is also important to stress that the community of justice, or those affected by NELD, is wide and encompasses individuals, as well as communities, societies/countries, and the environment or nature. However, most NELD seems to affect, directly or indirectly, human wellbeing (or welfare) and economic processes (including economic

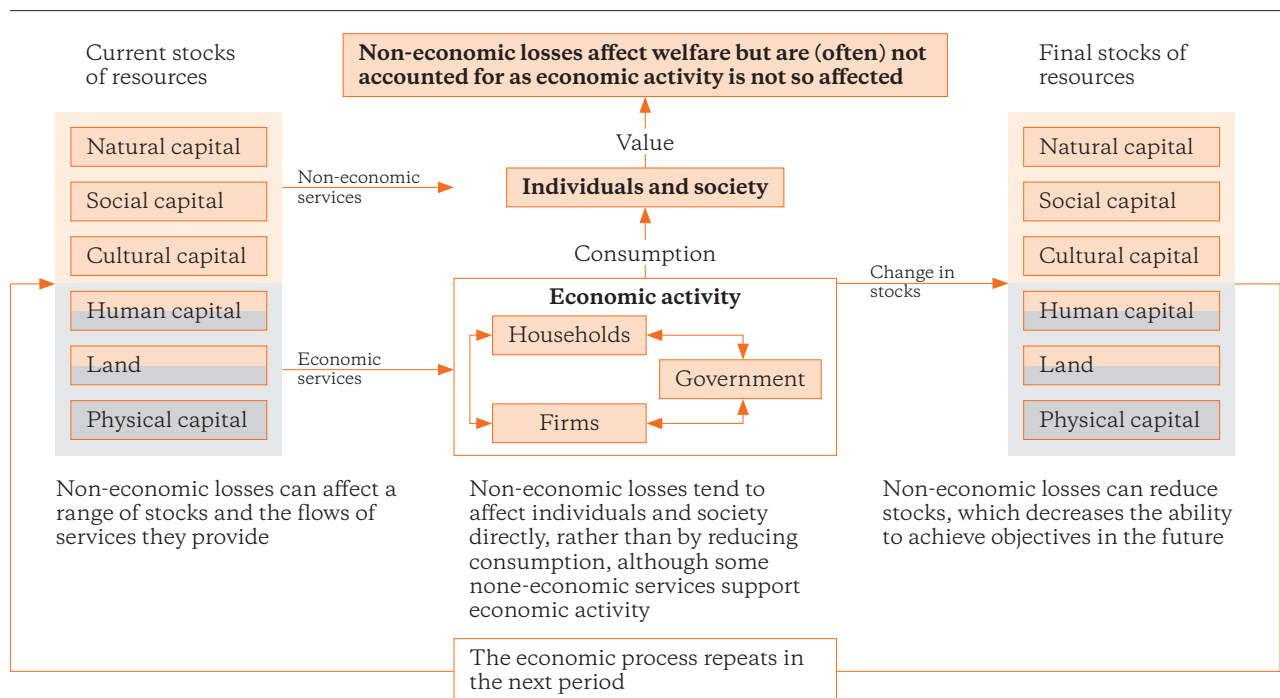


Figure 4: NELD and their direct and indirect effects on welfare and economic activities
 Source: UNCCC 2013, p. 20

processes outside markets). This is illustrated in the figure below.

What does that mean for the future work of the WIM, and its NELD expert group? We have made a number of recommendations on how to deal with the challenges identified in this chapter. These recommendations are summarized below, to be considered by the WIM and its expert group, but also by other stakeholders dealing with NELD.

1. In order to find innovative ways **to address incommensurable NELD**, which is difficult to financially compensate for, replace, restore, or rehabilitate, we recommend that the WIM further look into research findings and consult with anthropologists and psychologists who have expertise in traumatology, taking into consideration that the *recognition* of the loss is an important first step for the victims on the pathway to justice and reconciliation.
2. In order **to adequately address context-dependent NELD**, particularly when developing a standardized methodology for loss and damage assessments and registries, we recommend that the WIM encourage and commission further research.
3. In order **to adequately identify indirect NELD**, we recommend that the WIM undertake stakeholder consultations, including with those affected, to elaborate and agree on appropriate ways to proceed.
4. In order **to address the inevitably unsatisfactory response to claims for compensation and justice with regard to NELD** because of objections to attributing NELD to anthropogenic climate change, we recommend that the WIM work toward a compensation scheme to oblige major polluters to contribute to a global compensation fund, for instance through a global carbon tax.

Towards a registry - A NELD community-level research and assessment approach

Introduction

The assessment and valuation of non-economic loss and damage is a key requirement for dealing with NELD in line with the Paris Agreement and as demanded by those affected.

Thus, the technical paper of the UNFCCC (2013) on NELD puts particular emphasis on providing a comparative overview of possible methods of assessing NELD. It concludes that there are many assessment methods and experiences of dealing with the non-economic impact of human development and natural phenomena, but that the assessments and valuation of NELD remains very difficult due to the conceptual challenges discussed above.

The four main categories of possible valuation techniques are:

- **Economic valuation:** Values a change in the provision of a service or the value of an asset; in other words, it compares the relative merits of actions. The method has severe limitations in the case of incommensurable NELD.
- **Multi-criteria decision analysis (MCDA):** Values complex situations based on a set of criteria against which various alternative options are to be evaluated; scores but doesn't use monetary terms. This method may be appropriate for highly-intangible NELD.
- **Composite risk indices:** Relatively similar to MCDA, values vulnerability based on multiple criteria.
- **Qualitative & semi-quantitative approaches:** Values and provides information in a more disaggregated

form: scoring is semi-quantitative or qualitative, and mostly simple. A good example is the United Kingdom's Climate Change Risks Assessment (CCIAV).

The table below provides a brief overview of the strength and weaknesses of the four approaches.

The purpose of our field reports

Firstly, the purpose was to provide community-level knowledge from the field to enhance understanding of climate-induced non-economic loss and damage. The findings are not representative and cannot be generalized. They indicate, however, that NELD in the context of climate change is a problem warranting recognition, further research, and political action. The reports also intend to make the voices of those affected heard

Secondly, the methods for registering and valuing NELD are untested. Therefore, this research was also an attempt to enhance the understanding and development of methods that could be used for a NELD registry. The method developed does not claim to be a scientifically robust approach. It is a first attempt, in a relatively new field, and with a strong focus on being relatively easy to apply at community level, which is where our work usually takes place.

Finally, these reports aim to provide greater knowledge and expertise to support Bread for the World, ACT Alliance, Lutheran World Federation, Climate Action Network Tanzania, Evangelical Church Mekane Yesu in Ethiopia, and Christian Commission for Development in

	Invommensurability	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	Compatibility (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	Compatible	Compatible (provided scale of assessment is the same for all metrics)	Low

Table 2: Methods for valuating NELD and their compatibility with selected NELD characteristics
Source: Serdeczny/Waters/Chan 2016, p.19

Bangladesh in raising awareness and limiting the vulnerable local communities' exposure to climate-induced loss and damage.

The qualitative and semi-quantitative assessment method chosen for our field reports

Following Serdeczny/Waters/Chan (2016, p.21), who stress the importance of addressing context dependency in very different cultural and environmental settings (in our case: Tanzanian savannah, Bangladeshi coastlands, Ethiopian mountains, and El Salvadorian dry corridor) and incommensurability, we developed an easy-to-use assessment method for our field reports. This method combined qualitative and semi-quantitative elements (QSA). It worked well and delivered good results. A monetary valuation of NELD was not required for our purposes. Instead, the focus was on:

- identifying all forms of non-economic losses;
- identifying impact chains, including triggers and mediating processes;
- understanding who was affected and what the NELD meant to and for them;
- allowing communities to classify the NELD in a semi-quantitative way as low, medium, severe, and full loss and damage of a particular item;
- identifying possible ways of avoiding or minimizing future NELD;
- gathering information on how those affected expect or would like to see the NELD addressed;
- presenting the findings in the form of a kind of NELD registry.

Research areas

The field studies took place in:

- Tanzania, central Pwani region, Chalinze district, Msata village;
- Ethiopia, northern highlands of Amhara region, Legambo district, Dellel, Dereba and Chulkie kebeles;
- El Salvador, northern department of La Paz, municipality of San Pedro;
- Bangladesh, coastal Barguna district, two villages at Patharghata Upazilla.

Types of NELD covered

In our field research, we distinguished between the following types of NELD:

- a. Material loss and damage
 - i. Life
 - ii. Biodiversity/ecosystem services
 - iii. Land
 - iv. Territory
 - v. Artefacts
- b. Non-material loss and damage
 - i. Dignity
 - ii. Knowledge
 - iii. Social cohesion
 - iv. Identity/home
 - v. Physical/mental health.

Measurement and valuation of NELD

The data on different types of NELD were analyzed, measured, and valued, using a relatively simple classification scheme, as shown in the figure below.

Research methodology

Local researchers defined the areas, described the context, collected, where possible, baseline data, and conducted household interviews as well as focal group discussions and interviews with key informants. The respondents were selected based foremost on age, gender, and occupation. The selection criteria aimed to ensure the respondent's capacity to provide input on changes in climate and NELD in the community, to provide a fair representation of gender, and reflect the main livelihood activities in the area and the most vulnerable to climate-induced loss and damage. It is important to note that the sample size for these pilot field studies only offers a limited representation of the selected research areas.

Different data collection methods were used to complement data on individuals with data generated in a group setting. The focal group discussion (FGD) allowed respondents to build on each other's knowledge and experience, providing input beyond the individual level. The interviews were conducted in the local language, and later translated into English.

Given that most respondents were not familiar with scientific findings associated with climate change and

Possible criteria for a classification of L&D

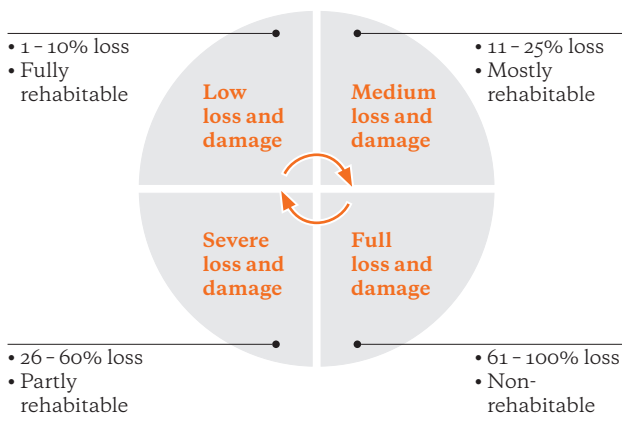


Figure 5: NELD classification scheme
 Author: T. Hirsch

NELD, most of the responses linked the cases of NELD to the weather. The climate-induced NELD was therefore identified and itemized using semi-guiding questions during the data collection process.

The data were systematically documented and registered by means of NELD registration lists. The data were categorized into the main types of NELD, as described above. The data were then classified as low, medium, severe, or full NELD per item, based on a semi-quantitative and qualitative measurement.

The entire methodology utilized to register NELD is untested and, as mentioned in the introduction, this research partially served to further its development.

In order to maintain a minimum quality of the research design, local researchers attempted to ensure construct validity through triangulation, utilizing multiple sources of evidence, and by reviewing the findings of key informants and peer researchers. Internal validity is mainly concerned with establishing a causal relationship, i.e. does condition 'x' lead to condition 'y' or are there other factors influencing the relationship. Climate-induced loss and damage might for instance be partially caused by additional triggers, and this causal relationship is highly complex. However, to increase internal validity, rival explanations are addressed. External validity is mainly determined by the generalizability of research findings. We attempted to improve the limited generalizability of the context-specific findings of the case studies by testing and analysing the proposed methods for registering NELD.

This research was conducted within the timeframe of one month per field study, and with limited financial resources. Due to these limitations, the sample size provides limited representativeness of the community studied. Another limitation is the non-existence of solid baseline studies, meaning there is no baseline against which to compare the findings. The lack of baseline studies, as well as the unquantifiable nature of NELD, renders a quantitative classification rather arbitrary. Finally, due to the scope of this research, the theoretical foundation for the categorization and classification of NELD was limited.

The theoretical framework for the method used is an important avenue for further research and development. Furthermore, the causal factors, the cases of NELD, the coping strategies, and the suggested ways of minimizing NELD provide input for future research directions.

The method of documenting and registering NELD appeared fit for purpose. The NELD types were wholly relevant to the NELD cases we encountered, and the local researchers did not identify cases which required different types. There are, however, a few minor points of concern. First, NELD cases can often be categorized into multiple types. While this is not necessarily problematic in itself, there is a need for a strong theoretical framework to provide a foundation for the rationale for categorizing a particular case as type 'x' or type 'y'. Furthermore, the types appear to be dynamically interconnected, which appears to be insufficiently reflected in the proposed method.

The method for measuring and valuating the cases of NELD appeared relevant. However, it is lacking strong classification criteria, and due to the unquantifiable nature of NELD, valuation along these lines is sometimes arbitrary.

Finally, the NELD registration lists appeared well designed to present the main characteristics of NELD. However, the researchers did encounter two challenges: (i) the amount of information to be included is extensive; and (ii) coping strategies reported by local communities are not included. The researchers suggest adding a column for coping strategies, and, due to the amount of information to be included, a simple coding scheme for an overview of the findings.

Cases of non-economic loss and damage in Tanzania

Research area and context

This research focuses on NELD in Msata village, a community of small-holder farmers and pastoralists within the Chalinze district in the Pwani region of Tanzania.

The main source of income and employment is agriculture, and second to that pastoralism (CDC, 2017). Furthermore, a number of livestock herds are reported to come from other regions, particularly upcountry pastoral communities, who moved to Chalinze due to scarce pasture and water sources in the originating pastoral regions. This has led to increased competition for resources among farmers and livestock keepers, especially along the Wami River and around other water sources (CDC, 2017).

The Chalinze district has a tropical savannah climate with temperatures ranging from 13°C to 30°C (CDC, 2017). Precipitation consists of bimodal rainfall with long and short rainy seasons, averaging at 800-1200mm per year (CDC, 2017).

Chalinze District Council (CDC) reports that the climate in Chalinze is changing; increased drought has resulted in water scarcity for farming and animals, scarce pasture for livestock, and reduced crop yields (CDC, 2017). Furthermore, the scarcity of water has exacerbated environmental degradation and rendered water sources such as the Mabungo stream and Kisanga shallow wells in Msata Village dysfunctional, causing communities to continue migrating to other areas that are more suitable for their livelihood activities (CDC, 2017).

The University of Oxford in cooperation with the Tyndall Centre for Climate Change Research (TCCCR) conducted research into the changing climate of Tanzania, reporting a mean annual temperature increase of 1.0°C since 1960, and statistically significant decreasing trends in annual rainfall (McSweeney, New, & Lizcano, 2010). These trends are reported for the entirety of Tanzania, and, although there is regional variation, appear to support the findings of Chalinze district council.

Interviews and focal group discussions

The research took the form of a case study, which was deemed appropriate because of its context-specific quality. The household interviews were conducted with the heads of five households, the FGD was conducted with ten respondents, and three interviews were conducted with local experts.

Given that the respondents were not familiar with climate change and NELD, most of the responses linked

the cases of NELD to the weather. Semi-guiding questions were therefore used to identify and itemize climate-induced NELD during the data collection process.

Causal climate events and additional triggers

The respondents identified multiple climate events, as well as additional triggers causing the NELD. The climate events and the additional triggers are, apart from minor exceptions, assumed to be jointly applicable to each NELD category.

First, the main climate events identified as (partially) causing the NELD are prolonged drought, desertification, erratic rainfall patterns, precipitation extremes, and seasonal shifts. Although there was no baseline study against which to compare these findings, the respondents identified these climate events, as well as the associated NELD, as occurring more frequently and with higher intensity than between 1960 and 1980.

Second, respondents reported climate-induced migration, population growth, deforestation, poor land-use planning, ineffective law enforcement, competition for natural resources, construction, unsustainable natural resource management, crop and animal diseases, environmental degradation, poverty, and insufficient engagement of local communities in planning and implementation of development initiatives as the main additional triggers for the identified cases of NELD.

Cases of climate-induced non-economic loss and damage

Biodiversity

Deforestation, including loss of tree species and plants used for traditional medicine, loss of bird species (used for weather prediction), loss of grass species for grazing, and loss of fruit-bearing shrubs/trees, was reported by the respondents. The NELD was classified as *severe*, and thus considered partly recoverable. The appraised severity of the NELD is based on the fact that the deforested areas are currently inhabited by communities, on projections of future crop yields that suggest an increase in livelihood diversification which includes deforestation for charcoal and firewood purposes, and on current population growth, which will increase the expected competition for natural resources and is thus likely to further

contribute to loss of biodiversity (see also Rowhani, Lobell, Linderman, & Ramankutty, 2011; NBS, 2015)

Ecosystem Services

The identified NELD is closely intertwined with biodiversity loss and includes degraded and dysfunctional water sources, and reduced water quality. These cases are accordingly classified as *severe*, and thus only partly recoverable. The reasoning for the determination of severity is similar to that provided for *Biodiversity*. The expected increase in deforestation adds to environmental degradation, and thereby reduces ecosystem services. Furthermore, the expected increase in competition, due to population growth, for a finite amount of natural resources, is likely to further limit per capita access to ecosystem services (NBS, 2015).

Land

The respondents identified a decrease in soil fertility, reduced crop yields, loss of indigenous crops and, thus, food, and reduced pasture growth as the NELD that had occurred. The NELD cases identified by the respondents

are generally expected to increase with climate change (Rowhani *et al.*, 2011; NBS, 2015). These cases have been classified as *medium* and are thus considered mostly recoverable. The main rationale behind this classification is based on the fact that the NELD to date appears relatively limited and that the introduction of a strong land use plan could potentially limit it (Bouma, Kuyvenhoven, Bouman, Luyten, & Zandstra, 1995; NBS, 2015).

Home

The respondents identified three cases of NELD: loss of home due to competition over natural resources, forced migration, and damage due to the inaccessibility of certain tree species traditionally used in the construction of houses. Note that forced migration might be also due to a reduction in productive land or due to competition over natural resources, further emphasizing the interconnectedness of NELD. The loss of home due to competition over natural resources, forced migration due to this competition, and damage to housing structure is classified as *severe*, and thus only partly recoverable because of expected population growth and current



The University of Oxford in cooperation with the Tyndall Centre for Climate Change Research (TCCCR) conducted household interviews with the heads of five households.

resource scarcity (NBS, 2015). The loss of home due to forced migration caused by a reduction in productive land was classified as *medium*, thus mostly recoverable, because of the mitigation potential offered by land use planning (Bouma *et al.*, 1995).

Artefacts

We define artefacts as man-made objects, the design of which pertains to a specific region. The respondents identified two cases of NELD which might be categorized as artefacts: loss of housing structure, as mentioned in the previous paragraph, and loss of access to graves used for rituals due to forced migration. These NELD cases are classified as *severe*, and thus partly recoverable, for the same reason as *Biodiversity*, *Ecosystem services*, and *Home*.

Physical Health

The main cases of NELD relevant to physical health identified by the respondents are insufficient food, resource competition leading to conflict and physical fighting, degraded and dysfunctional water sources, and reduced water quality. Insufficient food and resource competition leading to conflict and physical fighting have been classified as *medium*, and thus mostly recoverable. These cases of NELD all appear to be directly related to resource competition and land productivity. The reasoning for this classification thus follows the same path mentioned in the paragraphs covering the respective categories. The degraded and dysfunctional water sources and the reduced water quality are classified as *severe*, and thus partly recoverable, the rationale for which is as for *Biodiversity* and *Ecosystem Services*.

Dignity

The respondents identified multiple cases of NELD related to *Dignity*, and thus associated with loss and damage to the individual and community sense of dignity. The respondents reported (forced) migration to other (urban) areas, resource competition leading to conflict and physical fighting, loss of traditional medicinal practices, loss of respect related to a farmer's yields or a pastoralist's herd size, gauging the weather through observation of the seasons and through living organisms, such as certain bird species, forced livelihood diversification, increased hardship, reduced traditional migration of pastoralist tribes such as the Maasai, and an increasing number of marriages arranged out of food security considerations. The trend of reduced self-sufficiency is

evident from the reported cases of NELD, and might contribute to NELD in the sense of individual and community-level dignity. The respondents raised concerns that the drought-induced loss of herds may drive pastoralists into depression or even suicide due to the associated loss of respect and dignity. This example might illuminate for the reader the unseen potential effect of the changing climate on vulnerable communities, further emphasizing the non-economic dimension of NELD. The severity of NELD differs in each case. (Forced) migration to other (urban) areas, loss of respect, forced livelihood diversification, increased hardship, reduced traditional migration, and marriages arranged due to food security considerations were classified as *medium*, and thus mostly recoverable. The main rationale behind this determination is that the loss and damage to date is relatively limited, and that land use planning, effective law enforcement, and climate smart technologies have the potential to mitigate or minimize the NELD.

Knowledge

The respondents identified multiple cases of NELD. The loss of multiple rituals was reported, including but not limited to rituals to induce and predict rainfall, the 'Unyago' ritual performed to 'train' women as future wives, the 'Ngoma' traditional dance performed after harvest, certain mourning rituals, as well as rituals performed on land before (forced) migration. The loss of these rituals appears to be associated with both a loss of knowledge of how to perform these rituals as well as their very existence. Furthermore, the respondents noted that current generations were unfamiliar with certain indigenous crop types and, thus, food, traditional medicinal practices, and knowledge about gauging the weather by observing both the seasons and living organisms such as birds. The loss of these rituals is mainly due to the loss of biodiversity and land utilized for these rituals, declining accuracy of weather prediction rituals due to erratic weather patterns, and food and water scarcity, which makes it impossible to use them for rituals and limits the time that can be allocated to performing these rituals. The loss of knowledge regarding indigenous crop types was classified as *medium*, and thus mostly recoverable. The rationale behind this classification is as provided in the paragraph on *Land* regarding the loss of indigenous crops. The other cases of NELD pertaining to knowledge were classified as *severe*, and thus partly recoverable. This is based on the same reasoning applied to the NELD



Lucy Salom successfully runs a tailoring business in Kidatu, Tanzania. Traditional crafts like tailoring and handprinted fabrics are part of their cultural heritage.

related to *Biodiversity* and *Ecosystem services* in the material NELD sphere.

Social Cohesion

The rituals identified by the respondents under *Knowledge* are also applicable to the social cohesion of the community. The researchers argue that loss of these rituals and common gatherings potentially reduces social cohesion among community members. The respondents further identified (forced) migration to other (urban) areas, resource competition leading to conflict and even physical fighting, reduced interaction between small-holder farmers and pastoralists due to resource conflicts, reduced visits and interaction between relatives, reduced community gatherings other than rituals, and forced livelihood diversification. Each of these NELD cases appears to affect the social cohesion of a community. The loss of rituals is classified as *severe*, and thus partly recoverable based on the same rationale as provided in the section on *Knowledge*. The other cases of NELD are classified as

medium, and thus mostly recoverable. This is based on the relatively limited intensity of the NELD to date, as well as the potential for mitigation.

Identity

The NELD cases pertaining to *Identity* partially overlap with previous categories; they are however reiterated for clarity. The NELD identified are the loss of rituals, deforestation (including loss of indigenous tree species and medicinal plants), loss of indigenous crop types, loss of traditional medicinal practices, loss of respect related to a farmer's yields and a pastoralist's herd size, (forced) migration to other (urban) areas, loss of knowledge about gauging the weather by observing the seasons and living organisms, increased hardship, reduced traditional migration of pastoral tribes such as the Maasai, reduced visits/interaction between relatives, reduced community gatherings (other than rituals), marriages arranged out of considerations concerning food security, and forced livelihood diversification. The reported NELD appears to

influence individual and community identity. The loss of rituals, deforestation, traditional medicinal practices, and knowledge about observing natural phenomena to predict weather conditions have been classified as *severe*, and thus partly recoverable. The reasoning behind this classification is again as in previous paragraphs for these cases of NELD. The loss of indigenous crops, (forced) migration to other (urban) areas, increased hardship, reduced traditional migration of pastoral tribes such as the Maasai, reduced visits/interactions between relatives, reduced community gatherings (other than rituals), marriages arranged out of considerations concerning food security, and forced livelihood diversification have been classified as *medium*, and thus mostly recoverable. The reasoning behind this determination generally follows the same lines as in previous paragraphs. However, even if rehabilitated, it is uncertain whether the identity would remain undamaged as a result of the experience.

Mental health

The NELD cases categorized in the previous paragraphs could arguably each have some effect on mental health, yet a full cross-categorization is too extensive for the scope of this research. The effect of the other categories of NELD on *Mental health* has not been classified and is marked as 'variable'.

Coping strategies

The respondents were asked how they responded and changed to cope with NELD in their community. The NELD classified as severe in the previous section was often identified as beyond the community's capacity for adaptation. The NELD classified as medium was, however, identified as within the scope of individual/community-level adaptation by some of the respondents. The main responses identified were changing crops from indigenous types to types more resilient to the changing climate, migration to fertile lands and available water sources, and livelihood diversification; small-holder farmers taking up livestock-keeping activities, pastoralists taking up agricultural activities, and starting a petty business.

Some respondents stated that there was no option for livelihood diversification, that they were lacking knowledge on how to diversify their livelihood (especially regarding petty businesses and the financing behind it), a reluctance to give up their freedom through

livelihood diversification, and/or distrusting the viability of other livelihoods.

Ways of addressing and/or minimizing NELD

In order to gauge the respondents' perceptions of ways to address and/or minimize the NELD, they were asked to elaborate. The respondents stated the importance of increasing awareness of agricultural practices, specifically irrigation practices and resilient crop species, the introduction of modern livestock keeping and climate-smart agriculture technologies, the provision of reliable weather information to support planning and decision-making, increasing water accessibility, and environmental law enforcement.

Furthermore, the respondents highlighted the importance of external actors building adaptive capacity at the household level, developing initiatives for livelihood diversification, raising awareness of environmental conservation practices, both among households and civil servants, and implementing strong strategies to reduce income poverty.

Additionally, land use planning, sustainable natural resource management, indigenous crop conservation, planting of trees, provision of seeds for resilient crop and tree species, proper housing, cooperation between political representatives and the technical side of development initiatives, and the implementation of an assistance mechanism for vulnerable groups were identified as possible means of addressing and minimizing NELD.

Finally the respondents identified the need for more research into NELD at the community level and into adaptive capacity building, empowering the vulnerable in terms of knowledge, inputs, and climate-compatible technologies.

Discussion

The respondents were not familiar with the terminology and mechanisms of climate change, and thus linked NELD to weather conditions. The respondents did, however, without exception, report that the climate events and associated NELD have increased in frequency and intensity over the past 50 years, thus unknowingly implying changes in the climate. The types of climatic events and additional triggers discussed in the previous section were identified and presented as pertaining to the



The traditional breakfast in Tanzania is a rice dish called Ramadhani.

entirety of reported NELD cases. The distinction between specific climatic events and additional triggers, mediating the different NELD, if viable, might have provided a more detailed account of the causal factors behind the NELD. However, the researchers argue that apart from minor exceptions they jointly add to the causality of the reported NELD cases, and thus do not pose a significant hindrance to the preliminary categorization and presentation of NELD. However, the limited detail in the account of additional triggers arguably undermines the extent to which the reported NELD cases could be defined as climate-induced.

The NELD typology presented in the previous section serves as a tool to systematically register and analyse NELD. However, the definition and rationale has a limited theoretical basis. Furthermore, the categories themselves are dynamically interconnected. Due to the limited scope of this research, no cross-categorization has been provided, which might have provided illuminating findings. This is applicable especially to the non-material dimension of NELD, where certain cases of NELD are thought to be directly applicable to certain categories.

However, indirectly, the entirety of NELD in for instance the category 'Identity', could potentially cause further NELD in the other categories of non-material NELD, and is thus not identified by this study. There were no major contradictions identified in the findings, although some of the respondents did contradict themselves, often stating that human activities were adding to NELD, yet when only citing weather conditions as the contributing factors were.

The coping strategies stated by the respondents were mainly not case-specific, and thus rather identified as a general coping strategy in light of the changing conditions. The severe cases of NELD were identified as beyond coping, further emphasizing the community's perception of the extent to which NELD has already occurred and its irreversibility. The ways of addressing and/or minimizing the NELD provides a wealth of suggestions. However, limited input was provided regarding the operationalization and implementation of the potential avenues for reducing NELD.

Conclusion

Awareness of climate-induced non-economic loss and damage is limited. It is, however, of paramount importance as it represents the largely unnoticed consequences of climate change, and the way it affects vulnerable communities. The world is at risk of extinction, not only in terms of lives and biodiversity, but also indigenous cultures, traditions, rituals, and the home of those who did not partake in the events causing climate change.

Assessing the impact of NELD and its consequences is profoundly complex. However, through this research, the authors have attempted to support the endeavour by identifying and addressing NELD through an assessment of community-specific cases. The findings underscore the reality and severity of NELD in vulnerable communities, and present potential avenues for addressing NELD. This case report could enlighten the general public and policymakers alike by providing preliminary knowledge and potential directions regarding NELD. Finally, the findings of this report provide a foundation for Climate Action Network Tanzania's future endeavour in addressing climate-induced loss and damage in Tanzania and beyond.

Cases of non-economic loss and damage in Ethiopia

Research area and context

The research area, including the Kebeles of Dellel, Dereba, and Chulkie (see figure 6), is located in northern Ethiopia, in the highlands of the Amhara region in the Legambo district. Legambo is one of the 52 districts in the Amhara region which are chronically food insecure. The district faces food shortage every year for various reasons, with drought and frost being the major ones. About 60% of the approximately 165,000 inhabitants of the district are threatened by hunger for a period of 4-6 months every year.

The landscape is composed of rugged terrain with high mountains, escarpments, and deep valleys. Rainfall is bimodal, with a short rainy season (Belg) from January to March and a long one (Meher) from June to September. The average growing period is 135 days. Except for small remnants of natural vegetation in a few inaccessible places, the area is virtually stripped of any natural vegetation cover. The rate of forest cover in the district is estimated to

be just 0.61% of the total area. The continuous shrinkage of the natural forests and accelerated erosion have resulted in extreme land degradation and loss of fertile soil.

With regards to livelihood, as is typical in Ethiopian highlands, mixed farming (crop production and animal rearing) is the most important source of livelihood for the majority of the community in the research area.

The livestock sector plays a key role for the household economy next to crop production. However, the sector is restrained by challenges such as livestock disease, lack of adequate feed, and an inherently poor quality of local breeds.

Access to safe drinking water is a challenge and a large segment of the population (33.5%) is still imbibing water from unsafe sources such as rivers, unprotected springs, and ponds.

Increasingly frequent drought- and frost-induced crop failures cause households to be food insecure. In order to cover the food gap, the Productive Safety Net Program,

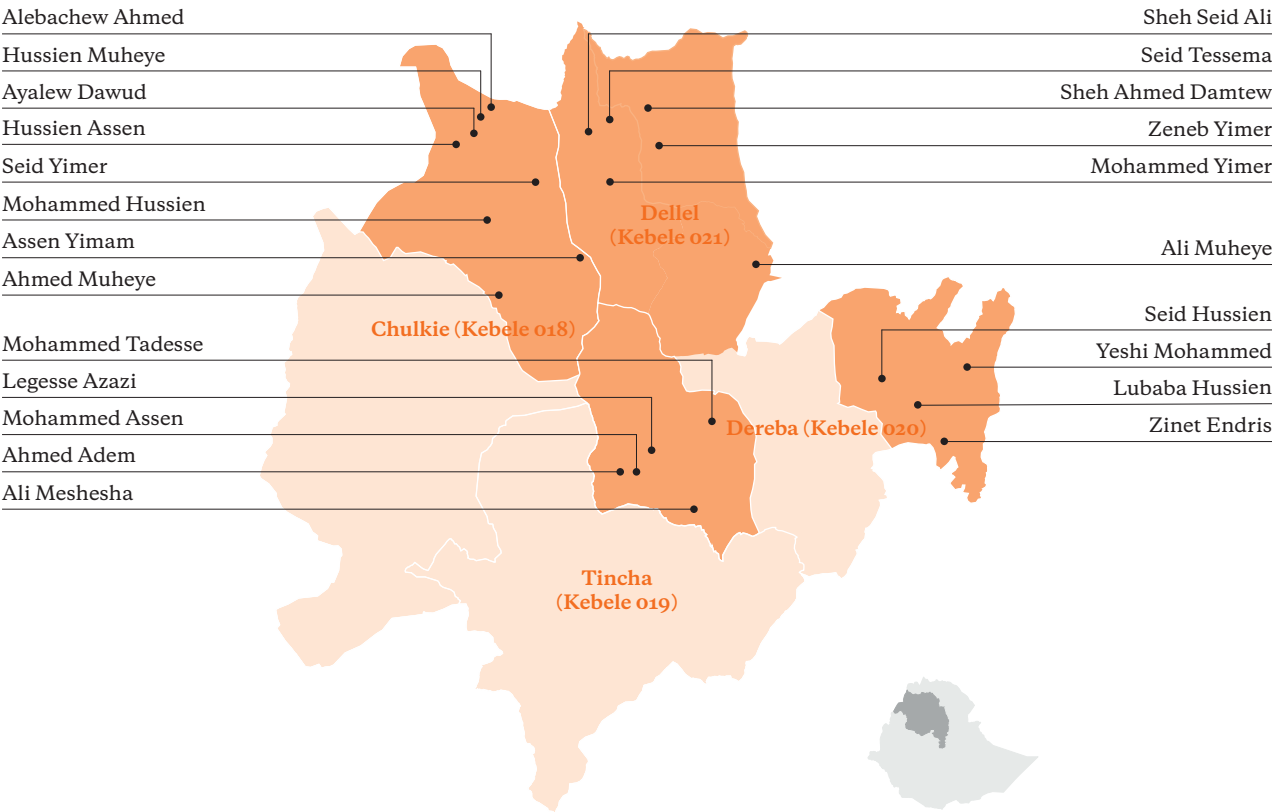


Figure 6: Non-economic loss and damage assessment Ethiopia

Author: E. Kassa

providing direct support to farmers, has been conducted for the last fifteen years. Due to resource limitations, not all people in need can regularly access the program: The landless youth, i.e. those who were too young to get land during the land redistribution in 1990 and now have their own households, usually don't benefit from the program despite being the most in need.

Both men and women are involved in productive and community work, yet women are exclusively responsible for reproductive activities and household chores. On average, women spend 16 hours per day on productive and reproductive activities. As far as productive activities are concerned, rural women in the district are engaged in activities such as planting, weeding, and harvesting. Additionally, they prepare food, fetch water, collect firewood, and take care of the children and the elderly. Decisions on the most important household issues, such as the sale of livestock, sending children to school, or the type of crops to plant, are mainly taken by men. Thus, women have little control over major decisions that deeply affect their life and the lives of their children. As a result of efforts made in the past few years, women have started to take part in public discussions and sometimes put forward suggestions. However, they barely chair meetings or make decisions. In general, women are less educated, have limited control over resources, and are often victims of violence.

Interviews and focal group discussions

The research was conducted in the form of a case report, covering the last 24 years. Members of 23 households were interviewed individually. Furthermore, three FGD took place.

The concept of NELD was unknown to the communities and had to be explained. The farmers showed a clear and in-depth understanding of weather patterns, such as increasing temperature, more frequent frost days, and increasingly unpredictable rainfall. Participants could relate the loss of assets such as crops, trees, biodiversity, and cultural and spiritual practices to the changing climate. However, they were not familiar with the global dimension and the root causes of climate change. Some people considered disasters as a punishment from God, and their awareness level did not allow them to think beyond that. Others were more aware that their own actions, such as cutting trees or improperly managing their land, at least contributed to the problems.

Causal climate events and additional triggers

The research area has been severely affected by the impacts of climate change, as indicated by climate data measured by the Ethiopian Meteorology Agency at the Kombolcha weather station, 25 km south of district capital of Dessie in the Amhara region. Maximum temperatures – in terms of both averages and extremes – are steadily increasing. Apart from the 30-year trend between 1984 and 2014, observational data indicate that the average annual maximum temperature in 2006-2014 has increased by 0.8°C as compared with the reference period 1986-2005.

According to the FGD participants, the most important change, apart from increasing temperature, is reduced and more volatile rainfall, often of a torrential nature and accompanied by hailstorms, the late onset and early cessation of rainy seasons, and increasingly unpredictable seasonality. The highland area is up to 3,570 metres above sea level, and used to have short and long rainy seasons. The short rainy season – Belg – was the more suitable season for crop and animal fodder production. Today the Belg rain-fed agriculture has become insecure, with poor harvests, due to less intense and more volatile rainfall. This rainy season now starts months later, at the end of April, and is no more suitable for highland crops. Meanwhile the longer rainy season – Meher – has also been delayed by two months and has been ceasing before the crops ripen.

The decline in the relative humidity of the air during the grain-filling period for the main seasonal crops has become a major source of crop failure due to frost, the second biggest climate threat. This has resulted – in combination with higher maximum air temperatures and higher evaporation, and additional triggers such as degradation of vegetation and the soil – in declining agricultural productivity (both crop and livestock), lack of alternative livelihood systems, higher vulnerability to disasters such as drought and frost, less access to drinking water and food, and, above all, people's decreasing confidence in their ability to cope with the changes.

Cases of climate-induced non-economic loss and damage

The communities stressed in particular climate change-induced loss of crop productivity and crop varieties, death of livestock, water scarcity, and loss of vegetation on the hillsides.



In sweeping community work, the residents of Chulke in the highlands of Ethiopia erected terraces and stone walls, that the area doesn't further degrade. Behind it, soil was piled up and planted with seedlings of trees.

Biodiversity & Ecosystem services

In the past, people were able to get enough water for their own consumption and their livestock nearby their village for the whole year. These days, after April, the majority of the springs dry up and the flow of the majority of the rivers is massively reduced. People are forced to travel long distances to get water for their livestock. Many of the springs have completely dried up because of disrupted rainfall patterns. This has been considered *severe NELD*, falling under drought-induced reduced *Ecosystem services*.

In terms of *Biodiversity*, the area was known for various varieties of crops and there now remain fewer varieties that have adapted to the current climate patterns of more drought and frost. Farmers reported the loss of many species in their area which can still be found in other districts. They expressed a need to strongly work on registering the lost biodiversity and plan for rehabilitation as current crops are less nutritious and less productive. Animal feed availability has also been negatively affected by the changing climate, impacting the major income source of vulnerable farmers. The majority of these farmers today cannot produce enough food for their families and they sell animals to buy grain from nearby districts. Also, it was reported that people in the

past used to use herbal medicine prepared by local herbalists and now many of these plants have disappeared. These losses have been considered *medium* severity.

Land

The losses in fertile land, due to climate-induced soil erosion and land degradation, also triggered by inadequate land management and overgrazing, have been considered *medium*, because they are mostly rehabilitatable.

Identity

The livestock sector has been heavily affected by poor fodder availability, which in turn has forced farmers to keep fewer animals. Livestock is a means of security, source of income, and indicator of social status in the community. These functions have been increasingly challenged. This has been classified as *low* severity.

Traditional knowledge

There used to be various species of highland trees, shrubs, and fodder plants in the mountains, but due to their partial extinction (climate change and incorrect land-use) the traditional knowledge of the plants' regeneration, propagation, and utilization has mostly been

lost. People have become unable to reforest the area. Also, the traditional knowledge about predicting rainfall and planning the agricultural calendar has lost value due to more volatile weather patterns. These have been considered cases of *low* severity.

Social cohesion

It was an important part of the community culture - and considered “quality of life” - to support each other by providing free labour, by sharing food in times of drought, and by supporting poor farmers with agricultural inputs. It was common to provide loans in the form of seeds to be paid back at harvest time, and to share pairs of oxen to cultivate the land of vulnerable and elderly farmers. This approach of mutual support in times of stress has largely disappeared due to the high pressure on every household to maintain their own livelihood. Nowadays, participants reported, if a farmer fails to acquire crop seeds, he has to share the land with a farmer who has seeds. Lending ploughing oxen or contributing free labour has become unthinkable because people can no longer afford to make contributions to others for free. This has been being categorized *severe NELD*.

Health

People considered their *Physical health* situation today to be worse, due to mal- and undernourishment, water scarcity, and new diseases. In terms of *Mental health*, they felt much more stressed as a result of increasing uncertainty, loss of sovereignty, and more and harder work. Looking back, they considered the life they used to have to be more relaxed. Now, life has become very challenging. People worry about their own life, the future of their kids, and most importantly, their kids experience a stressful mood with no bright future. Participants shared stories of the past. They reported that today every kind of farming activity is a risky business and that farmers wouldn't be confident to be able to harvest crops that look great at the vegetative stage. They considered the near future to be too uncertain to have long-term plans for their livelihood. They reported becoming increasingly dependent on aid provided by the government and NGOs. This has been classified as *medium* severity.

Discussion

In terms of NELD, the interviewees stressed that 25 years back, they used to produce sufficient food grains of various

crops such as barley, oats, wheat, and, in some areas, beans and peas. They had enough grazing land and fodder production for their livestock, which was their major source of income, enabling them to send their children to school, to cover other living costs, and to keep larger herds to save for future expenses. People stated that the situation in the research area had significantly changed, leaving the livelihoods of people today more vulnerable. Apart from material losses, the biggest concern was the decrease in social cohesion within the community, and the increasing loss of sovereignty, leaving people more dependent, less energetic, more hopeless, and calling into question important elements of their identity and culture, up to the point where they cannot afford to cover the costs related to the preparation of cultural ceremonies.

What their coping strategies are

People have developed various coping strategies that have helped them to reduce the impact of extreme climate events. They keep some grain reserves; store crop residues and hay for their livestock; travel to neighbouring districts to buy animal feed and grain; reduce the number of livestock; feed their livestock shrub roots and eucalyptus leaves if the worst comes to the worst; cull some of their cattle and sell the meat at reduced prices and buy grain to supplement their diet. Some travel to their better-off relatives for grain and animal feed support. It has also become common to send some members of the family to cities to work there and then support the family. This includes sending young family members as migrant workers to Gulf countries. In addition, almost all families rely to a certain degree on aid from the international community.

The increase in droughts seems to have made people more resilient but also less social. The majority of respondents said that nowadays nobody cares about supporting anyone except their own family or, in rare cases, other blood relatives. The community has experienced the impact of drought for many years, and expressed the view that people have improved their resilience through becoming more aware, diversifying their sources of income, improving savings, and working harder. One farmer quoted an important Amharic saying: “If one keeps the beauty of hands, the beauty of face will fade away”. They reported that the drought in 2015/2016 was very severe and equivalent to the drought in 1991, but that the adverse impacts in 2015/2016 were less serious.

Ways of addressing and/or minimizing NELD

Most people expect the government to grant monetary and food support in times of disaster, including school feeding programs. They consider improved medical facilities for both humans and livestock to be essential in minimizing NELD, and they ask for a minimum level of feed support in case of another drought, so that they can keep a limited number of livestock alive to maintain the genetic pool, which can be built up again after the disaster. They also expect the government to create jobs outside of agriculture for their children, since the land is exhausted.

NGOs are expected to bring innovation, to build up capacities, and to financially support land rehabilitation and improvements in land and livestock productivity. Participants expressed little hope for a return of their lost biodiversity, since the climate would never be the same as in the past. However, they expressed hope for support in better adapting their agriculture to the changing climate.

Conclusion

This local-level research has revealed that so far little emphasis has been placed on NELD by the farmers and

professionals in the field of rural development and natural resource development. During the discussion with the community, it took us some time to explain loss and damage, and especially non-economic losses, since nobody had talked about those issues in any forum before. Development field workers expressed their view that NELD is a new and very relevant dimension for their work, which so far has been overlooked. In the course of the FGD, farmers recognized many items that had been lost. They proposed adaptive measures they should and could implement to maintain what they still have. We take this as a strong indication of how important it is for both professionals and communities to create awareness of NELD, also in view of protecting the future. Therefore, we recommend:

- Raise awareness of NELD among professionals working at the community level and government officials at all levels;
- Register non-economic loss and damage in areas that are vulnerable to adverse impacts of climate change;
- Advocate for more emphasis on minimizing and addressing NELD at COPs;
- Mainstream NELD in community development programs.



Erosion protection and water project in a river bank in Ethiopia.

Cases of non-economic loss and damage in Central America

Research area and context

The most recent study on “Characterization of the Central American Dry Corridor” states that of the 57 areas characterized as livelihood areas in Central America, i.e. areas where productive activities such as agriculture are carried out, 47 are located in the so called “Dry Corridor”.³ In El Salvador and Honduras almost all livelihood areas are located in the Dry Corridor, while in Guatemala and Nicaragua approximately 75% of livelihood areas are situated in the Dry Corridor.

Over the last five years, El Salvador has suffered the worst droughts in the last two decades due to climate change, generating loss and damage in the agricultural sector worth more than USD 200 million.⁴ The worst drought of the last 44 years was experienced during 2015.

Of the 104 municipalities in El Salvador, 40% are in the Dry Corridor, affecting mainly agricultural activities and putting at serious risk the food security of the population. The negative effects of climate change are additional stress factors on top of the already difficult situation, and affecting in particular the most vulnerable population sectors of the country.

In view of this situation, the Central American Program of the Lutheran World Federation, together with ACT Alliance, has provided humanitarian aid and recovery support in the most affected areas of the region. We have documented the huge economic losses and also analyzed how climate change has affected the population in terms of non-economic losses.

In this regard, this first case study has been conducted to highlight the dimensions of the problem, thus contributing to enhanced understanding and the collection of NELD data.

One of the areas most affected by drought was chosen for this study: The municipality of San Pedro Masahuat in the Department of La Paz, which is located approximately 40 km from the city of San Salvador.

Interviews and focal group discussions

The sample used for the study included some of the families affected by the recurrent drought that received humanitarian aid following ACT appeals. The field research was carried out in July 2017 with a structured

survey that covered 33% of the village population (40 families) affected by the recurrent drought. 40 people took part in the interviews and FGD, of which 93% were women and 7% men. It is important to emphasize the participation of women in this case study, because they are the ones who depend most on humanitarian aid in cases of extreme events. Most men then leave the village and look for work outside the community.

92% of the interviewees are part of the economically active population. They are all engaged in agriculture. For 73% of the total population interviewed, agriculture is the main activity, providing 100% of their income. It is important to mention that only 48% (19 families) own land, which is between 1 and 2 blocks (0.7 and 1.4 hectares). The other farmers lease land, paying between a certain percentage of the harvest and USD 10.

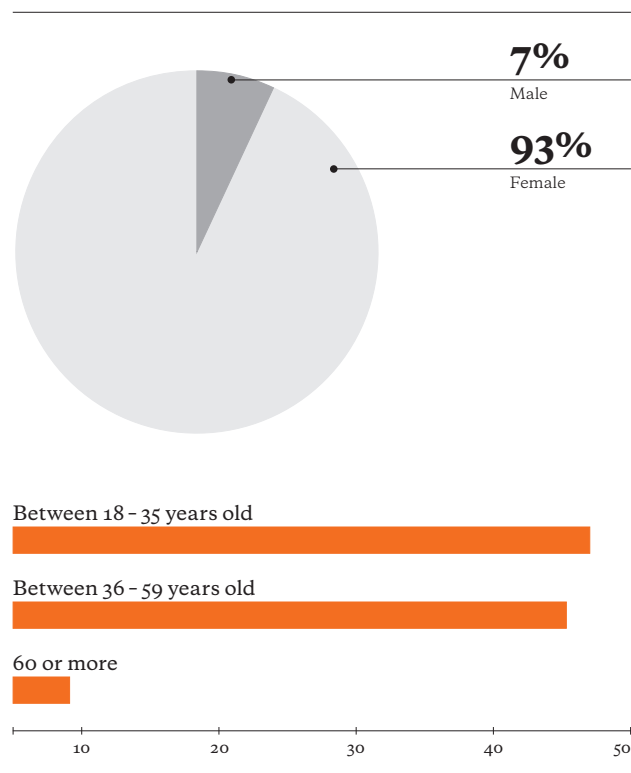


Figure 7: Characteristics of the population

Source: Own elaboration based on interviews on “Losses and damages associated with climate change”, addressed to the population in the municipality of San Pedro Masahuat, July/2017. (Author: E. Cedillo)

3 — The Dry Corridor (Corridor Seco) is a semi-arid, drought-prone area covering parts of Guatemala, Honduras, and El Salvador.

4 — Source: Ministry of Agriculture of El Salvador - MAG and the Economic Commission for Latin America and the Caribbean - ECLAC



The pools at the Rio Grande, Honduras, dried up during the last three years. The water level sunk leaving only puddles and children are catching fish by hand.

Climate change-induced non-economic loss and damage

The surveyed population has suffered from different extreme events such as droughts, floods, and heat waves. Droughts and floods are considered the most damaging triggers and their frequency and intensity have drastically increased. When asked if they could remember how the drought of 20 years ago compared with the years since 2010, 76% mentioned that the impact was much less 20 years ago. The increase in floods is similar: 68% of the respondents said they were fewer and less serious 20 years ago.

Droughts

98% of the population indicated that they are most affected by droughts, identifying 2011 as the year from which they started to experience higher loss and damage. Several NELD types were identified under which loss and damage can be classified. The next question was related to additional triggers of NELD. We then asked about coping strategies and possible additional ways to minimize or address NELD.

In general terms, respondents identified to a great extent *Biodiversity* losses, reduced *Land productivity*,

including with effects on the agricultural frontier, and severe *Mental health* problems. It is important to stress that all respondents indicated that they have considered leaving their village and moving to another city because

Most common climate events

Drought



Floods



Illnesses



Heat waves

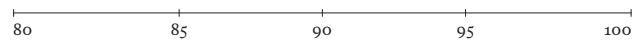


Figure 8: Climatic events that most affect the population surveyed

Source: Own elaboration based on interviews on “Losses and damages associated with climate change”, addressed to the population in the municipality of San Pedro Masahuat, July/2017. (Author: E. Cedillo)

their means of livelihoods is no longer viable. This indicates a *severe* loss of *Identity and Sovereignty*.

Interviewees also identified different additional factors that complicate drought, such as lack of irrigation systems, unsustainable use of water, deforestation, soil erosion, and “bad infrastructure”.

Furthermore they listed different actions and strategies to minimize the negative impacts of drought and minimize NELD, such as reforestation plans, more efficient use of water, enhanced adaptation programs, and support in the form of agricultural supplies and financial aid. The central government is named as having the main responsibility for minimizing and addressing NELD. NGOs are expected to provide technical assistance for the recovery of agriculture.

Floods

93% of the interviewees said that the second most important trigger of NELD are floods. They have been affected by floods since 2006, which have intensified since 2011.

Rain has become more torrential, and the rainy season pattern seems to have changed.

75% of the interviewees identified the following additional triggers for flood-induced NELD: Soil erosion, deforestation, and poor infrastructure (i.e. land near rivers and ravines without borders or barriers).

As the main actor for actions and strategies to minimize or address flood-induced NELD, people stressed the role of the state in reforestation and fortification of critical infrastructure (border reinforcement and barriers), as well as cleaning channels. Municipalities were also mentioned as responsible for infrastructure improvement.

With regard to NELD relating to land productivity, people consider financial compensation an equitable way of addressing NELD.

Conclusion

Those who suffer most from climate-induced NELD are people who are economically active in agriculture. Many of them do not own their land, which may negatively

	Quantitative L&D	Qualitative L&D
Life	No human lives were lost	
Biodiversity/ Ecosystem services	76% of the respondents identified that biodiversity has been lost.	<ul style="list-style-type: none"> ✓ Forests were lost. ✓ Wild animals, especially birds, have died. ✓ Farm animals also died.
Productive land	89% of respondents indicated that land productivity has been lost.	- 48% of the interviewees considered losses in the productivity of the land to exceed 26%, and thus only partially recoverable.
Territory	87% of the interviewees mentioned that the agricultural frontier has been lost and that the main causes are soil erosion, actions to maintain soil richness and pests.	- 80% of the interviewees considered it possible to take action to recover the agricultural frontier.
Artefacts		
Knowledge	19% of respondents identified a loss of traditional knowledge.	- They have been forced to change the pattern of planting; the rainy season has been altered.
Social Cohesion	35% of those interviewed identified that this type of climatic event affects social cohesion.	- Drought forces them to abandon their land and to look for work outside; thus losing a sense of “community”.
Identity	100% of the interviewees mentioned having thought or thinking about going to another place because of a lack of resources, since the economic activity that has served to support their family for decades is no longer viable.	- A constant loss of crops forces families to separate and/or move to other territories, therefore losing their customs.
Mental and physical health	57% of respondents indicated that their mental health has been affected.	- The interviewees experience sadness, depression, loss of hope, desperation, worry, and frustration.

Table 3: Non-economic loss and damage caused by drought

Source: Own elaboration based on interviews on “Losses and damages associated with climate change”, addressed to the population in the municipality of San Pedro Masahuat, July / 2017. (Author: E. Cedillo)

	Quantitative L&D	Qualitative L&D
Life	No human lives were lost	
Biodiversity/ Ecosystem services	75% of the respondents identified that biodiversity has been lost.	<ul style="list-style-type: none"> ✓ Forests were lost. ✓ Wild animals have died. ✓ Farm animals also died. ✓ Water sources have been destroyed. ✓ Contamination of drinking water.
Productive land	93% of respondents indicate that land productivity has been lost.	- 53% of the interviewees considered losses in the productivity of the land to exceed 26%, and thus only partially rehabilitatable.
Territory	36% of respondents reported that land has been lost, and that the main causes are soil erosion and the lack of barriers for the protection of riverbeds.	- 70% of the interviewees considered it possible to take action to recover the territory.
Artefacts	N/A	
Knowledge	4% of the interviewees recognize the loss of traditional knowledge as a result of flooding.	- Respondents identified a lack of rain in the months when it was supposed to rain.
Social Cohesion	14% of those interviewed identified that this type of climatic event affects social cohesion.	- It is reported that with less production, there is less employment, which forces them to look for other sources of income outside their homes.
Identity	18% of those interviewed mentioned that they plan to go elsewhere because of flooding.	
Mental and physical health	57% of respondents indicated that their mental health has been affected. 39% of respondents indicated that their physical health was affected by respiratory diseases of different types and allergies.	- The interviewees experience sadness, depression, frustration, and concern.

Table 4: Non-economic loss and damage caused by floods

Source: Own elaboration based on interviews on “Losses and damages associated with climate change”, addressed to the population in the municipality of San Pedro Masahuat, July/2017. (Author: E. Cedillo)

affect their access to support and compensation, depending on the design of (future) schemes to address loss and damage.

Drought and excessive rainfall are the main climate triggers of NELD. The most severe material NELD occurs in the form of biodiversity loss, decreasing land productivity, and loss of territory (moving the agricultural frontier). In terms of non-material NELD, the loss of traditional knowledge, social cohesion, and identity are the most severe. Indirectly, mental and physical health is undoubtedly negatively affected.

More than extreme flooding as a sudden phenomenon, prolonged drought as a slowly evolving phenomenon seems to provoke more lasting frustration and a persistent lack of hope among the population. This leads the population not only to abandon their land but to also to give up agriculture, which in many cases had been carried out for generations and thus was an integral part of their peasant identity and culture.

As additional triggers, interviewees identified deforestation, soil erosion, and the unsustainable use of water.

Both the central government and municipalities were considered responsible for implementing strategies to minimize loss and damage. Proposed actions range from plans and policies to promote reforestation to disaster risk reduction and infrastructure improvements.

Flood events are perceived more as a “disaster” and drought as a “characteristic” of the environment in which we live, which has become more severe over the last years.

Altogether, climate change with its extreme events and adverse effects causes a very worrying loss of identity. We are in the process of seeing large population groups emerging that define their identity mainly as “affected population” or “climate-change victims”.

In view of these findings we recommend:

- Expand the research to other communities in the Dry Corridor in Central America, including indigenous



At the lagoon of Alegría, Usulután, El Salvador, water levels have dropped dramatically during the 2014 drought and the water has receded hundreds of metres.

populations and young people as well as communities in South America living in territories such as the Andean mountains and the Amazon;

- Include as part of a follow-up study the record of all adaptation and mitigation practices that have been implemented by the affected population over time;
- Deepen research on NELD related to social cohesion, identity, and mental health; the affected population is mainly economically active and will, without a positive vision, plans and hope for the future, fall back into the vicious circle and an endless pit of poverty and vulnerability;
- Identify what differentiates this research, starting from the fact that we have a distinctive hallmark as a faith-based organization, placing people at the centre of everything; therefore, we must emphasize NELD that directly affects people, and work towards a better understanding, and minimizing and addressing it.

Cases of non-economic loss and damage in Bangladesh

Research area and context

Coastal Bangladesh is exposed to multiple weather-related extremes and thus the coastal fisherfolk communities have experienced numerous forms of loss and damage. Extreme events such as cyclones, storms, and floods are increasing in magnitude and frequency due to climate change. It is estimated that more than 3.5 million coastal peoples' livelihoods directly or indirectly depend on fishing and related activities under extremely difficult conditions, and their economic hardship is most likely to be aggravated by climate change (Chowdhury et al., 2012).

Although data is not sufficiently available, preliminary research findings suggest that throughout 2016, coastal fisherfolk communities faced an average of eight early warnings and during each warning they had to stop fishing for 4-5 days. This incurred a significant monthly economic loss, not taking into account non-economic losses that are difficult to quantify, such as loss of life, health, culture, biodiversity, and ecosystem services. Therefore, to understand loss and damage more comprehensively, NELD needs to be explored. Thus, the main objective of this field report was to identify the extent of NELD affecting fishing communities.

Research was concentrated in two villages at Patharghata Upazilla in the Barguna district, next to the Bay of Bengal. The main criteria for selecting these villages were the level of exposure to different types of climatic hazards and socio-economic vulnerability. Although the research achieved its objectives, there are some limitations. Due to the time limit, the research was conducted with a limited number of participants. To generalize the results for larger groups, the report would need to involve more participants at different levels.

Interviews and focal group discussions

Qualitative and semi-quantitative data collection methods were used for this study. Two FGD with 15 participants each and interviews with twelve households were conducted. A FGD checklist was developed, including open-ended questions. All questions were pre-tested before collecting the data from the field. A gender-balanced sample was purposely selected in consultation with the local fishermen and community leaders. Before the FGD, informants were given a general description of the research, and the intended use of the research findings was clarified.

Climate change-induced non-economic loss and damage

Loss of life

The coastal fisherfolk communities of Bangladesh face continuous threats caused by cyclones in the Bay of Bengal, the most cyclone-prone area in the world. According to statistics, cyclones have become more frequent and more intense due to climate change, and this trend seems to be accelerating (Singh et al. 2001). To give some examples: On 11-12 November 2002, 34 fishermen died and 560 were reported missing after a cyclone (Talukder A, 2003). In July 2003, 173 fishermen were reported missed after 20 trawlers sank in rough seas. In the Barguna district on the southern coast, at least 77 fishermen on 12 trawlers went missing after torrential rainfall in 2007. Later in 2007, nearly 600 people were killed and thousands of others, mostly fishermen, disappeared after one of the worst



Figure 9: Research area in Bangladesh
Author: Habib Torikul, Efaz Ahmed

cyclones in decades, which was accompanied by huge waves and torrential rain.

The families suffer great pain after the passing of a fisherman. They have to deal with financial problems since they have no other source of income. Therefore, families go hungry, unable to afford new clothes, medicine, or other household items; they cannot even afford to send their children to school. Education ceases, and children are forced to find work to support their family.

In interviews, it was found that in these cases young girls are married off at a very early age due to growing economic pressure on the household. Many of the marriages are arranged and often forced by the parents or other family members. They should be playing, learning, and enjoying their childhood. But instead, they are being married off, sometimes in secret weddings.

Since men are responsible for buying groceries for the household, widows face the burden of doing the grocery shopping; they abandon their role as a housewife and are compelled to go to the village market. However, they are not proficient at bargaining with the traders, who often exploit them by selling goods at higher prices.

Widows are compelled to find work outside the home in order to survive and to support the family. When a widow appears in public, she faces harassment and other forms of social torment from the villagers, which causes enormous mental stress. Young widows in particular often become victims of violence, or evicted from their homes and robbed.

Physical health

Fishing is an occupation that involves sustained exposure to sea water. Participants reported that fishermen today suffer more often from sea sickness than in the past, due to the increasing salinity of the water and the air, and because of more frequent heat waves. They suffer from vomiting, dehydration, dizziness or headaches, and discharge of blood in their urine. During the FGD, many respondents mentioned suffering more often from eye problems. This is caused by the use of saline water for washing, since sweet water has become very expensive due to increasing scarcity.

In Padma village only basic medical support is available. In more severe cases, fishermen go to the Upazilla clinic ten kilometres away, or directly to Barisal city 86 kilometres from Barguna. At times, fishermen have to sell their property and belongings in order to cover the cost of medical treatment and travel.

Mental health

Families suffer trauma when they lose a family member, which is happening more frequently due to more extreme events. Finding the missing body reduces the pain for the family, because at least then a proper burial can be arranged. When a fisherman disappears at sea, the family usually waits a long time for his return. Women face the worst psychological pressure as they are heavily dependent on their husband. Widows are burdened with harassment, which puts additional pressure on them.

In Padma village, no professional psychological support is provided. Support would usually only be granted by family members or neighbours.

Education

The livelihood of a family comes to a standstill when a fisherman disappears. As indirect NELD, children drop out of school. The family can no longer afford to purchase school uniforms, books, stationery, or other essential items. They have to work to support the family. As another severe indirect NELD, girls are forced into arranged marriages if the breadwinner of the family dies.

Culture

Fish is only a source of livelihood for the inhabitants of Padma, it also provides them with a source of joy, excitement, and prosperity. Whenever there is a good catch, they celebrate among the village and it brings out a sense of exhilaration and festivals are held. The villagers arrange and organize social gatherings with neighbours, family members, friends, and relatives, and offer various delicacies by cooking *Polao* rice, fish, meat, and vegetables.

Now, with the reduction in fish species in the sea, people earn less and cannot afford to pay for festivals as in the past. Thus indirectly, poorer catches due to climate stressors lead to a loss of cultural activities.

Biodiversity

“The population of the villagers has increased, but the population of the fish is decreasing,” said one of the fishermen during the group discussions. With the growing adverse impacts of the climate, in particular higher water temperatures, the population of many fish species is declining, and species are disappearing. In addition to extreme temperatures, additional stressors were mentioned, including overfishing, loss of ecosystems, higher salinity, and water contamination.

The case of Amina Khatun

Amina Khatun has lived in Padma village since she was nine years old. Now, at the age of 65, she is struggling to make ends meet. She lives in a small house with her daughter's family at the northern end of Padma village. All she has is a tiny plot of land she inherited from her husband. She had two sons, one of whom died during cyclone SIDR. Since the passing of her son, Amina has suffered from depression and it took her a month to recover from the initial phase.

The death of her son made her life difficult as she had to work to survive by cutting straws in the field and by collecting shrimp post-larvae. She has now stopped working due to ill health and old age.

“I will not let my grandchildren go to sea. With whom will I live? If I die, who will bury me? How will I live, how will I eat? If they die before me, then how will I survive?” - Amina Khatun (65)

The case of Karim Gazi

“This is the place where I belong. I was in my house when suddenly the floor started to crack. Slowly chunks broke into the river and with it my home disappeared, which was built just two years ago. I have lost my homestead five times in my life. This process of losing my home due to river erosion started when I was with my parents. After marriage, when I moved out with my wife, I thought we would find some relief from river erosion. But there is no escape. We are just moving from one land to another.” (Karim Gazi)

Karim Gazi today works as an engine-rickshaw puller. In the past, he had a small boat, which was destroyed by cyclone SIDR. After losing his homestead for the last time, he decided to migrate with all of his family to Barishal city. “We are victim of erosion,” he says. “We are landless and aimless. The river not only erodes our land but also our lives.” Now his family lives in a tiny house in the form of a temporary thatched shack. He lost three acres of land to river bank erosion. Now Karim Gazi earns BDT 250 to 300 daily (approximately €3.25). He has to pay BDT 70 per day to the rickshaw owner in

rent. Although he found pulling the rickshaw quite hard, he has become used to it. His income is not regular because rickshaw pulling depends on physical strength. He is not able to send his children to school due to extreme poverty. The dream and life of Karim Gazi has been shattered due to river erosion - which is closely related to climate change.

Conclusion and recommendations

Not too long ago, coastal Bangladesh was considered a *sanctuary for fish*. Now, from Satkhira to Bhola, from Noakhali to Cox's Bazar, *fishermen* are *struggling* to survive due to rising sea levels, increased salinity, more frequent and intense cyclones, and changes in the ocean's current patterns. These climate stressors have a massive impact on the fisherfolk communities not only economically, but also non-economically, i.e. in terms of losses in culture, identity, dignity, health, biodiversity, and others. Apart from the difficulty valuating these losses in monetary terms, it is important to stress that many of these losses cannot be replaced or restored: Once lost, they are gone forever. Based on our findings, we recommend:

1. Undertake further research and in-depth analysis of the loss in biodiversity and ecosystem services, and look for conservation solutions;
2. Conduct an ethnographic study to better understand the value of culture, heritage, and indigenous knowledge, and find solutions to preserve them;
3. Provide climate risk insurance solutions for the fishermen and their families;
4. Find alternative forms of livelihood or employment opportunities for fishermen;
5. Build the capacity of fishermen and train them in climate disaster risk reduction.

Climate-induced migration: Loss and damage leading to a means of last resort

The UNFCCC Technical Paper on Non-Economic Loss (2013) considers human mobility and displacement as another form of NELs. For our study we have chosen a slightly different approach, considering human mobility and displacement in the context of climate change as an ultimate consequence, or means of last resort. Findings from our local-level field research seem to support this approach. The WIM has also taken the approach of dividing its work on climate-induced migration and NELs: It established two independent action areas, with the Taskforce on Displacement and the NELs expert group in charge of both. However, both areas are closely interrelated. This is why we have chosen to include a chapter on climate-induced migration in this publication.

While in general migration is an umbrella term comprising different categories of human mobility, including migration across borders or within a country for different purposes and due to a variety of root causes, climate change-induced migration is a complex phenomenon lacking a clear universally agreed conceptual definition.

It involves people who voluntarily chose to migrate, legitimately considered an adaptation strategy to respond to environmental pressure, but also those temporarily or permanently displaced by climate-related disasters, depending on the frequency of the climate-related weather events and the degree of environmental deterioration.

Climate migration is by no means a far-off future scenario; even today it is already a reality on a massive scale. People in the poorest regions of the world in particular find themselves forced to leave their homes because climate change has destroyed the basis for their livelihood.

Incremental and slow-onset events such as persistent droughts or rising sea levels frequently lead people to decide to migrate, and further factors besides climate change can play into such a decision. Although such migration may be prophylactic, often there is no alternative. Solid forecasts on the extent to which climate change will in future force people to leave their homes, as well as regions where this will occur, do not exist. Whether and how people are driven to migrate or become displaced depends to a great degree on their capacity to adapt to climate change, as well as on the kind of support they receive.

Yet, the Internal Displacement Monitoring Centre (IDMC) argues that in 2015 people were twice as likely to be displaced by a disaster than they were in the 1970s. Due to global warming, an average of at least 21.5 million people are already being displaced each year by the impact and threat of climate-related hazards.⁵ The large majority of these hazards were extreme weather and related events such as flooding. Only relatively few people move across international borders, affected people mostly stay within their country.⁶

Under the WIM work program, displacement is acknowledged as a “non-economic loss”. Hence, the loss and damage that displacement represents cannot regularly be quantified monetarily, nor can it be traded in markets. The impact and consequences of displacement in the context of climate change might even become more significant than economic losses and trigger the latter, especially in developing countries that are particularly vulnerable to climate change-related weather extremes.

In Tanzania, where migration mainly takes place in rural areas, migration in response to weather shocks is a risk management strategy as families seek to diversify income, as discussed in our case report. But weather extremes undermine people’s capacity to migrate, as they rely on diminishing crop yields and eroding assets.⁷ Hence, from a loss and damage perspective, the situation for affected people is aggravated.

In Bangladesh, too, those who are forced by adverse weather shocks to move to cities – or rather toward the outskirts of urban agglomerations – are hardly able to access formal labour markets. Rural poverty is usually transformed into urban poverty, and vulnerabilities even increase, as shown in our case report.

Our local-level research in Ethiopia indicates that migration to cities and even neighbouring countries like the Gulf States is triggered by the loss of livelihood in the context of climate change.

For the Dry Corridor in El Salvador, migration to urban areas is mentioned by all participants of the case report as a last resort, also due to a loss of livelihood in the context of extreme climate events. People covered by the case report, however, do not prefer this option, as long as

5 – <http://internal-displacement.org/assets/publications/2016/20161102-climate-change.pdf>

6 – Nansen Initiative, 2015, Agenda for the protection of cross-border displaced persons in the context of disasters and climate change. Volume 1. www.nanseninitiative.org

7 – www.ferdi.fr/sites/www.ferdi.fr/files/publication/fichiers/wp104_ferdi_maurel_et_kubik_climate_variability_and_migration_mis_en_forme.pdf

it is avoidable, since they consider it a severe loss of their peasant identity and sovereignty.

In extreme cases of climate-induced migration, people need to be resettled, as it is outlined for Tuvalu. This applies not only to the state of Tuvalu; as a consequence of rising sea levels in the Pacific, entire island nations could literally sink. Nations would relocate their populations and lose their territory, and the state in question might cease to exist. Such a loss of statehood that is not a result of conflict, cessation of territory, unification, or inheritance of rule over a territory would set a precedent

in international law. The population of such a nation might become stateless. However, these islands would become uninhabitable long before they actually disappear, because, as the example of Tuvalu shows, drinking water and arable land would become scarce resources. If the entire population is driven into exile, this would leave behind a state without a population.

For many people living in island nations, fishing and other maritime resources are their basis of subsistence, and these resources are at the same time the state's greatest economic assets. Should an island actually be submerged

Non-economic loss and damage in Tuvalu

The 13-year-old school girls from Tuvalu – Fialupe Solomona, Velma O`Brien, and Raijeli Isala – cannot imagine a life outside of Tuvalu, although they have experienced living abroad. Fialupe was born in Australia and Velma has lived in New Zealand for six years. But moving abroad because of climate-induced sea level rises would be different, knowing that they would not be able to come back and would lose their home forever. The girls are very proud to be from Tuvalu, as it is their home. “We are not leaving Tuvalu!” is their decisive comment.

Tuvalu, a Polynesian island nation in the Pacific Ocean, is most vulnerable to climate change. Especially climate-related sea level rises and extreme weather events, such as more intense king tides and storms coming in higher density, are threatening the very existence of the island state. The approximately 10,000 citizens live on a total land area of 26 square kilometres, situated in Oceania. On average, land is only elevated two metres above sea level. The highest elevation is 4.6m above sea level, which gives Tuvalu the second-lowest maximum elevation of any country after the Maldives. The most destructive cyclone hitting Tuvalu in recent years was Cyclone Pam in 2005, when waves reached 6 metres.

Maatia Toafa, Deputy Prime Minister and Minister of Finance and Economic Development, is absolutely aware of the lethal potential of cyclones like Pam, and that his citizens were lucky that Pam did not take a single life. The priorities are climate adaptation and disaster risk management: With wave breakers,

sandbags, and land reclamation projects, a lot of effort is made to keep Tuvalu safe. In light of these massive efforts that have to be undertaken to adapt Tuvalu to climate change and the knowledge possessed by every Tuvaluan of the risks of climate change, would it not be worth considering migrating to another country to stay safe?

Velma O`Brien rejects this option, even though she is aware that Tuvalu might sink into the Pacific Ocean, with the land areas becoming uninhabitable long before that. “If it sinks, we have to sink in our own country, we can't migrate to other peoples' countries, because it is not our home!”

From their own experience and that of family members working abroad, they are afraid to be second class people living in for example Australia or New Zealand without same rights and losing their dignity.

The government, however, does everything to provide those individuals who want to migrate with the legal options to do so. But why risk the diaspora and not resettle the entire population in another country, like the low-lying island state Kiribati is planning?

“Under no circumstances will we resettle our nation,” explains Toafa. “If our country is drowning, we will drown together with Tuvalu. There won't be a Tuvalu II on another state territory. What makes Tuvalu is our land, the people, the culture, and the language - you can't resettle this!”



Fialupe Solomona, Velma O'Brien and Raijeli Isala are proud of their home country Tuvalu, they don't want to relocate. They fear losing their language, their rights and that they couldn't live a life in dignity in Australia or New Zealand.

into the sea, it would lose its territorial waters and therefore also its fishing and other rights of use.

Moreover, without a homeland, the cultures of these people are at risk. Traditionally, the Pacific Islanders see their islands as the homes of their ancestors' souls, a feeling which creates an additional and very deep bond with their land. A pronounced awareness of the distinctiveness of their culture is an integral element of the identity of Pacific Islanders, which is reflected in the cultural diversity of the Pacific Islands.

Climate-induced migration and resettlement would therefore entail not only material but also non-material losses.

To compensate at least partially for the loss of territory, the government of Kiribati has already bought a large plot of land on Vanua Levu, an island belonging to Fiji.

With agricultural produce from this island, Kiribati aims to improve supplies on the home island, as well as create an additional source of income, which would also bolster Kiribati's resilience. At some point in the future, Kiribati could potentially relocate a part of its population

to this area. Such a project, however, has already met with strong reservations among the local population in Fiji.

While migration is not necessarily a means of last resort for people exposed to the consequences of climate change, many times it is actually to be seen as an additional source of vulnerability, especially when the need to move is not facilitated by the state. That is to say, if affected, vulnerable populations aren't supported when they seek more resilient livelihoods they could end up in even more hazardous surroundings, as limited mobility schemes and a lack of appropriate policies result in increased risk. If mobility is not ensured, people might find themselves trapped in limbo.

In summary, both sudden and slow-onset impacts of climate change increase internal and cross-border displacement of people and affect human mobility strategies.

The case reports show that acknowledging, mapping, and managing the risk of non-economic loss and damage, manifested as displacement, must be a central aspect of climate change policy.

Lessons learnt and policy recommendations: How to deal with NELD

Climate change leads to manifold problems and provokes economic loss and damage. This however, is not the full picture. As this discussion paper shows, there is another dimension to loss and damage, going beyond the damage that can be measured and financially compensated for: Loss of biodiversity and ecosystem services, loss of land, territories and artefacts, loss of life, health, knowledge, social cohesion, identity and sovereignty, leading ultimately to migration or displacement, affecting climate justice and threatening the ability to make progress towards achieving the SDGs for the most vulnerable.

NELD is complex to identify and understand. While the phenomenon as such is not new, it emerged as a political and research issue only a few years ago. Accordingly, there are still many knowledge and data gaps, and few answers as to how to minimize and address NELD, as demanded by the community of states when they mandated the WIM to work towards that end. NELD, as our case examples show, has not only been overlooked for a long time by researchers and policymakers, it has also not been recognized or tackled by development practitioners and affected communities themselves with the attention and focus it deserves. Awareness raising, understanding, recognition, and acknowledgement of the harm caused by climate stressors, in combination with other factors, are important first steps in bringing justice to the people affected. Respondents felt relieved after the FGD deliberations, which brought to light causal impact chains and the interrelatedness of the many problems they suffer, without having set it in the full climate change context yet. The next step is to encourage discussions on how best to minimize and address future NELD so as to avoid another race to the bottom.

Non-economic losses can be at least as severe as economic losses, as we have seen in the field reports: Loss of life and mental health, loss of identity and social cohesion, loss of livelihood and biodiversity are massive problems, very hard to address, and they are often permanent.

The incommensurability and context-dependency of NELD are obvious additional challenges. Many cases of NELD are composed of closely intertwined types of non-economic losses, as for example loss of land and loss of social cohesion, or loss of biodiversity and loss of traditional knowledge. We have documented other cases, where economic and non-economic losses are closely interrelated, for example, climate-induced loss of life (the breadwinner of a family), leading to the impoverishment of the family, and then resulting again in non-economic

damage, with children being deprived of an education, or girls forced into early marriage.

This illustrates that there are often also indirect impact chains between climate-induced stressors and NELD, and how difficult it can be to attribute NELD to climate change.

It needs to be emphasized that NELD also has a strong normative dimension which cannot be neglected and which brings us to fundamental justice concerns: Who is affected by NELD and to what extent are human rights being violated? What are the calls for justice and who are they addressed to? Is it “only” a moral or is it also a legal or political issue? Who is responsible for NELD? Who failed to meet their human rights or legal obligations and caused NELD? Who can be expected - or is expected by the victims - to address and minimize NELD? Who will decide which cases of NELD are recognized and which are not? And who will ultimately pay for it?

The agenda of the WIM workplan on NELD, as elaborated by its expert group, sets the right focus but only partly covers the concerns and proposals raised by the communities consulted for this study. In the short time period allotted, it won't be possible for the WIM expert group to exhaustively investigate NELD and sufficiently advise the WIM on how to adequately minimize and address it. Thus, we consider the workplan only as a first step. It needs to be immediately followed by many more steps to acknowledge, map, register, and manage the risk of non-economic losses and damage in a way that provides justice to the affected.

In the following we propose some elements for a future roadmap to deal with NELD at various levels. Our recommendations build on the political and conceptual findings of the first two chapters, which summarized and assessed the current state of play. Moreover, they take into consideration the main findings of our field studies on the ground and the views of the communities consulted, bringing the people to the forefront.

Elements and milestones for a roadmap to understand, minimize, and address NELD

1. Enhance research on NELD

In order to adequately understand NELD, particularly with regard to context-dependent and indirect NELD, we recommend that the WIM encourage and commission further research and stakeholder consultations, including



The area around Gopalganj, Bangladesh, has been heavily devastated by the hurricanes in 2007 and 2009. In addition, there are problems with arsenic-contaminated drinking water and salty soil due to the many flooding.

with those affected, to elaborate and agree on appropriate ways to proceed. In terms of content, a wide range of issues have been brought to light by local researchers and communities, including the need to deepen understanding of the loss of biodiversity and ecosystem services and ways to conserve them; the need to conduct anthropological research on NELD regarding culture, territory, and indigenous knowledge and how to maintain them; the need to expand research to other climate-vulnerable areas, for instance the Andean and Amazon regions, and to better include indigenous people and the next generation; the need to document adaptation and mitigation practices that have been implemented by the affected populations to minimize NELD; and the need to deepen understanding of NELD related to social cohesion, identity, and mental health and find ways to prevent people falling back into the vicious circle of poverty and vulnerability

2. Acknowledge and recognize NELD

In order to address NELD that is difficult to compensate for, replace, restore, or rehabilitate, we recommend that the WIM, national and local governments, and other stakeholders acknowledge and recognize non-economic

losses that occurred. This is an important step for the victims on the pathway to justice and reconciliation.

3. Set up NELD registries

We recommend setting up registries of loss and damage, including non-economic loss and damage, beginning with areas that are particularly vulnerable to the adverse impacts of climate change. Similar procedural standards should be developed, under coordination of the WIM, to ensure a minimum coherence and comparability of the results, and at the same time providing the necessary flexibility to deal adequately with highly context-dependent, incommensurable, and partly indirect NELD. The highly participatory assessment approach we used, applying a qualitative and semi-quantitative validation approach in combination with a more common NELD typology, may provide a methodological basis to build on.

4. Put a strong focus on displacement and migration in the context of NELD

Acknowledging, mapping, and managing the risk of NELD manifested as displacement must form a central aspect of any further approach to minimizing and addressing NELD.

The WIM Taskforce on Displacement and the WIM Expert Group on NELD should closely work together and seek cooperation with other relevant stakeholders inside and outside the UNFCCC.

5. Mobilize finances from new sources to understand, minimize, and address NELD

In order to address the inevitably unsatisfactory response to claims for compensation and justice with regard to NELD, among other because of objections to attributing NELD to anthropogenic climate change, we recommend working toward a financial scheme which obliges major polluters to contribute to a Global Loss & Damage Fund, for instance through a global carbon tax.

6. Mainstream NELD in UNFCCC/PA processes

We recommend initiating a process leading to the inclusion of NELD as a mandatory item in national communications to the UNFCCC, and in National Adaptation Plans (NAP).

7. Address NELD at national and local levels

In order to raise awareness and build capacity in understanding, minimizing, and addressing NELD, we recommend that national and local governments, and other stakeholders working at these levels, take concrete action, such as including NELD in the national curriculum and capacity-building programs for professionals working at relevant levels; mainstreaming NELD where appropriate in community-development, environmental, regional, infrastructure-development, and disaster-risk-management plans and programs; setting up and implementing concrete action for those affected and most at risk, for instance by providing climate risk insurance solutions, social safety programs, or alternative livelihood programs.

8. Create a NELD research, documentation & advisory centre

NELD goes beyond the mandate and capacity of the WIM, or the UNFCCC. The possible future implications at the interface between man and nature – in particular in view of accelerating NELD in the future – are wide, deep, and severe. Climate-induced loss and damage may shape environmental, cultural, and socio-economic systems, as well as the personal sphere. NELD may become a characteristic of the Anthropocene, as the new earth age, under the hegemony of humankind. This gives us reason to recommend that a NELD research, documentation & advisory

centre be founded, to be jointly operated by UNFCCC, UNESCO, UNEP, and UNDP. Such a centre could receive a wider mandate for “Anthropocene research” and could be a central institution for documenting NELD, including managing a future NELD or “Loss & Damage” registry. It could also serve as a platform for systematically collecting and providing information on possible ways to minimize and address NELD in the context of climate or environmental change.

List of tables and figures

Table 1:	Chronology of main loss and damage milestones in the UNFCCC process	9
Table 2:	Methods for valuing NELD & their compatibility with selected NELD characteristics	21
Table 3:	Non-economic loss and damage caused by drought	37
Table 4:	Non-economic loss and damage caused by floods	38
Figure 1:	NELD milestones in the UNFCCC process	13
Figure 2:	Risk profile and cost curves for mitigation, adaptation, and loss and damage	14
Figure 3:	A conceptual framework to categorize main types of NELD	18
Figure 4:	NELD and its direct and indirect effects on welfare and economic activities	20
Figure 5:	NELD classification scheme	23
Figure 6:	Non-economic loss and damage assessment Ethiopia	30
Figure 7:	Characteristics of the population	35
Figure 8:	Climatic events that most affect the surveyed population	36
Figure 9:	Research area in Bangladesh	40

List of abbreviations

AA	Action Areas
AOSIS	Association of Small Island States
ACT	ACT Alliance
CAN	Climate Action Network Tanzania
CCBD	Christian Commission for Development in Bangladesh
CCIAV	Climate Change Risks Assessment in the United Kingdom
CDC	Chalinze District Council
COP	Conference of the Parties to the UNFCCC
CPRD	Center for Participatory Research and Development in Bangladesh
CRI	Composite Risk Index
EECMY-DASSC	Ethiopian Evangelical Church Mekane Yesus Development and Social Service Commission
EV	Economic Value
EWKT	Ekalesia Kelisiano Tuvalu
EXCOM	Executive Committee of the Warsaw International Mechanism for Loss and Damage
FGD	Focal Group Discussion
IDMC	Internal Displacement Monitoring Centre
L&D	Economic and Non-economic Loss and Damage
MCDA	Multi-criteria Decision Analysis
NELD	Non-Economic Loss and Damage
NELs	Non-Economic Losses
PA	Paris Agreement
QSA	Qualitative and Semi-quantitative assessment Approaches
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
WCC	World Conference of Churches
WIM	Warsaw International Mechanism on Loss & Damage

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