Publication Series

ADDRESSING LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES

National and International Approaches to Address Loss and Damage from Slow-onset Processes – Status quo, challenges, and gaps

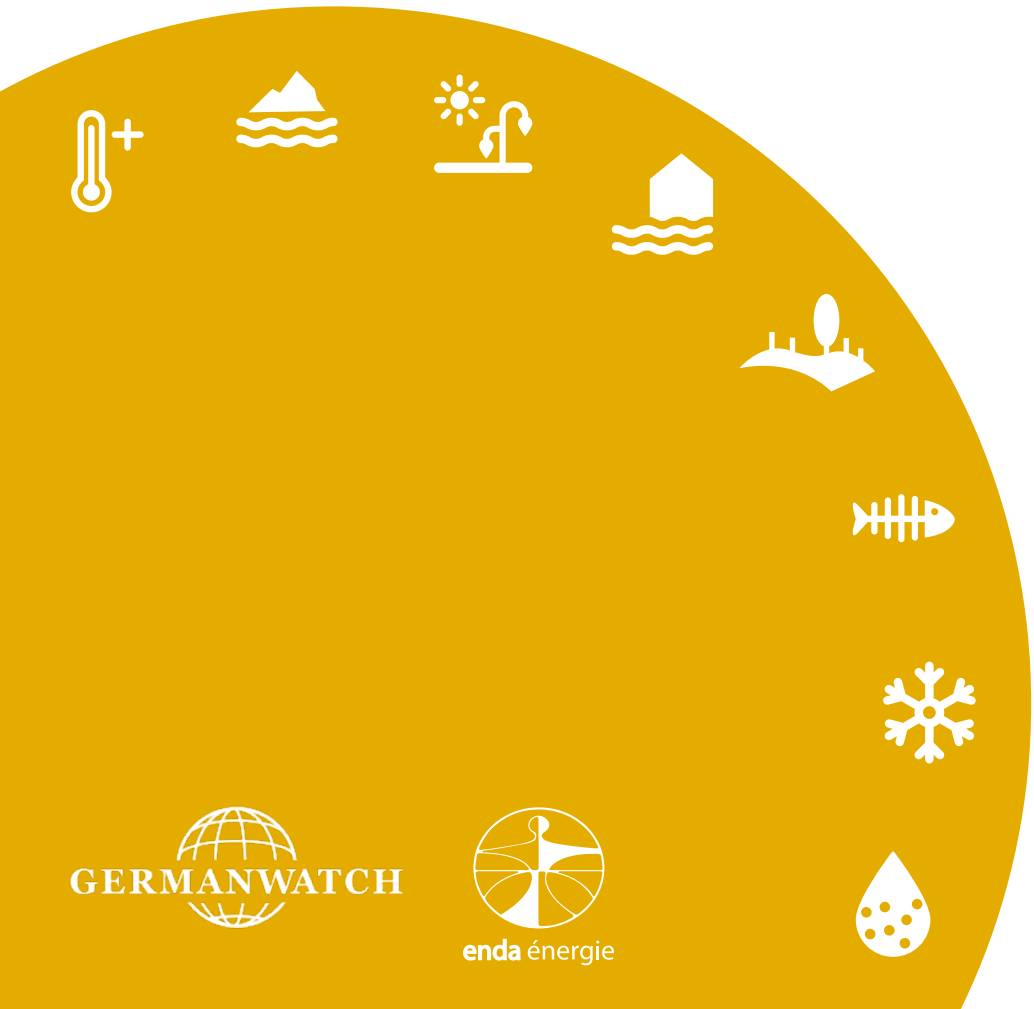

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Table of contents

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List of abbreviations

AOSIS	Alliance of Small Island States
CBD	UN Convention on Biological Diversity
CRM	Climate risk management
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
ExCom	Executive Committee of the Warsaw International Mechanism for Loss and Damage
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
GMSL	Global mean sea level
GMSLR	Global mean sea level rise
IOM	International Organization for Migration
L&D	Loss and damage, losses and damages
OCHA	Office for the Coordination of Humanitarian Affairs
SB	Intersessional Meeting of the Subsidiary Bodies to the United Nations Framework Convention on Climate Change
SBASTA	Subsidiary Body for Scientific and Technological Advice
SIDS	Small Island Developing States
SLR	Sea level rise
SROCC	Special Report on the Ocean and Cryosphere in a Changing Climate
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDRR	United Nations Office for Disaster Risk Reduction
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlement Programme
UNHRC	United Nations Human Rights Council
UNU	United Nations University
WIM	Warsaw International Mechanism for Loss and Damage

List of tables and figures

SUMMARY OF KEY FACTS AND DEFINITIONS

Key facts and definitions from paper I: 'Slow-onset Processes and Resulting Loss and Damage – An introduction'

What is a slow-onset process?

The effects of climate change can be divided into two categories according to the temporal scale over which they occur and the differing speed of manifestation of their impacts: slow-onset processes and rapid-onset events. To date, in the climate context, no officially acknowledged definition of slow-onset processes has been established. For this paper, slow-onset processes are understood as phenomena caused or intensified by anthropogenic climate change that take place over prolonged periods of time – typically years, decades, or even centuries – without a clear start or end point (see UNFCCC 2012a, UNU 2017, UNHRC 2018, IPCC 2007 and 2012). Slow-onset processes evolve through gradual transformations - creeping or incremental changes that can generate severe, cumulative and potentially irreversible impacts on ecological and human systems. Impacts take place at all levels up to the global scale. Slow-onset processes' characteristics can be well understood when compared with rapid onset events, in the climate context typically referred to as extreme weather events. Rapid-onset events are single, discrete events with a clearly identifiable beginning and/or end and that occur or reoccur in a matter of days or even hours at a local, national, or region scale (UNHCR 2018).

Which phenomena fall under the category of slow-onset processes?

This paper considers increasing mean temperatures, sea level rise, ocean acidification, glacial retreat, permafrost degradation, salinisation, land and forest degradation, and desertification, as well as loss of biodiversity, as slow-onset processes (see UNFCCC 2017, UNU 2017). The paper puts a special emphasis on the distinct slow-onset process of sea level rise, which is one of the most urgent such processes in Senegal, our case study country. Droughts are a special case and not included in the list of these processes. Droughts result from a pattern of extreme weather that persists for some time (e.g. a season) and can be classified as an extreme climate event (IPCC 2014c).

What losses and damages do slow-onset processes cause?

Loss and damage is understood as "adverse impacts of human-induced climate change that cannot be avoided by mitigation or adaptation, or that will not be avoided in the future by adaptation due to insufficient resources" (Mace/Verheyen 2016: 198). A main distinction can be made between economic loss and damage (including [a] physical assets and [b] income) and non-economic loss and damage (including [a] material and [b] non-material forms). The analysis for this paper (see section "Status quo of addressing loss and damage from slow-onset processes at the national level" on page 18 et seq.) showed that all slow-onset processes cause a high number of different losses and damages; sea level rise and land and forest degradation lead to the greatest number of losses and damages. This includes economic damage to physical assets (e.g. infrastructure and property) and income (e.g. losses for fisheries and aquaculture, losses in livestock and agriculture production, and losses for tourism). It also includes non-economic loss and damage in its material form (e.g. damage to ecosystems and their services, and loss of land area or territory) and non-material form (e.g. loss of heritage, identity, health, and local and indigenous culture). In the analysis the selected slow-onset processes caused a higher number of non-economic than economic losses and damages.

Slow-onset processes are interlinked and mutually reinforcing. They all lead to a damage and/or loss of ecosystems and their services, leading to a decrease and loss of biodiversity. Slow-onset processes and the losses and damages they cause can be drivers of human mobility (Rigaud et al. 2017). Migration as an adaptation strategy or way of dealing with loss and damage, however, can lead to further non-economic losses, such as loss of culture and traditions, language, social networks, identity and community cohesion (Campbell/Warrick 2014). Research showed that slow-onset climate changes are more likely to induce increased migration and displacement than rapid-onset changes (Kaczan / Orgill-Meyer 2020). Research also hints that, similar to rapid-onset events, slow-onset processes and resulting losses and damages particularly affect vulnerable people in countries of the Global South (Warner/van der Geest 2013, Zorn 2018). This is also partially due to the fact that slow-onset processes, as well as climate-related rapid-onset events, and related hazards perpetuate collective and individual vulnerabilities (van der

Geest/Schindler 2017). These parts of the population are more vulnerable to a hazard's damaging effects (because, for instance, their livelihood depends on fewer assets and their consumption is closer to subsistence levels) but have lower coping capacity (because, for instance, they cannot rely on savings to buffer the impacts and may need longer to rebuild and recover).

Key facts and definitions from paper 2: 'National and International Approaches to Address Loss and Damage from Slow-onset Processes – Status quo, challenges, and gaps'

What approaches and measures are there to address loss and damage due to slow-onset processes?

Comprehensive climate risk management (CRM) and the climate risk management cycle are often used as an approach for managing risk of loss and damage and addressing actual loss and damage. Existing climate risk management approaches, however, do not effectively cover risks and impacts from slow-onset processes. This can partially be explained by the linear logic of the climate risk management cycle being difficult to apply to slow-onset processes that gradually manifest and have ongoing effects, and the challenge in defining a clear beginning and end. Initial steps are being made to address this conceptual gap (e.g. NIDM/GIZ 2019).

The differentiation in averting, minimising, and addressing concepts anchored in the Paris Agreement can be useful with a view to concrete measures for dealing with loss and damage. Loss and damage is determined by the level of preventive action, both through reducing greenhouse gas emissions and by adaptation and disaster risk reduction measures to reduce vulnerabilities and build resilience. Therefore, the first priority should be to prevent or minimise potential loss and damage through effective mitigation, adaptation, and risk reduction measures. It is, however, no longer possible to prevent or minimise all loss and damage, and not all climate change impacts can be successfully adapted to, whether because of financial, technical or physical constraints. The other essential element of loss and damage measures therefore includes strategies to address and minimise unavoided or unavoidable loss and damage. Measures need to cover both economic and non-economic losses and damages. These can be clustered in curative and transformative measures (see Schinko et al. 2018). Concerning sea level rise, exemplary curative measures include, for example, (support for) setting up or scaling up financial protection measures and support for involuntary climate-induced displacement and forced migration, along with recognition of loss and active remembrance for cases of non-economic loss and damage. Support for voluntary migration and support in building up alternative livelihood provisions serve as examples of transformative measures.

What is the status quo of addressing losses and damages due to slow-onset processes at the national level?

Our analysis based on a literature review, a country case study of Senegal, and interviews in Malawi, Madagascar, Laos, the Philippines, and Sri Lanka showed countries still have major gaps in addressing such losses and damages. Decision makers are generally aware of the problems and to try to reduce the risk of loss and damage, countries integrate some slow-onset processes as part of their adaptation and risk reduction strategies and plans. Despite this, although some slow-onset processes, such as sea level rise, are included in climate change and disaster risk management plans, the plans are often not effectively implemented at the local level. Moreover, a common challenge interviewees from different countries report is the lack of (sufficient) local data on different slow-onset processes and their local level impacts.

Although general slow-onset processes are known in their countries, there is often only limited knowledge on the local-level impacts of, for example, sea level rise on different parts of the country. Slow-onset processes have, thus far, not been adequately monitored over the long term in most countries so as to determine the baseline risk associated with slow-onset hazards and to track rates of change (UNFCCC 2012). Although some curative and transformative measures could be identified in Senegal, a systematic approach to adequately address loss and damage owing to slow-onset processes could not be identified. For Senegal, the lack of adequate financial tools and instruments and the weakness of domestic financing remain key challenges in financing the fight against slow-onset climate hazards' impacts. Although there are some funds that could partially cover loss and damage due to slow-onset processes, most are not yet operational. There are also no formal mechanisms for managing forced or planned retreat due to sea level rise. This lack results in households paying for a large part of the funding for the fight against the impacts of slow-onset processes, such as coastal erosion, salinisation of land and water resources, loss of biodiversity, desertification, and declining yields due to rising mean temperatures.

What is the status quo of addressing losses and damages due to slow-onsets under the UNFCCC?

Slow-onset processes have a long history of being discussed under the United Nations Framework Convention on Climate Change (UNFCCC) and are included in a large number of decisions. Regarding concrete technical work, an analysis of the Executive Committee of the Warsaw International Mechanism for Loss and Damage (ExCom) list of activities clearly shows that the focus in addressing loss and damage from slow-onset processes lied, and lies, in enhancing knowledge and understanding, and in strengthening dialogue. The third function of the Warsaw International Mechanism for Loss and Damage (WIM), enhancing action and support, falls short; thus far, only three activities that fulfil this function have been implemented or planned.

This finding is also reflected in the 2019 WIM Review that analysed the progress of the ExCom's Workplan. In the breakout group discussion on the

question of 'Which ExCom Workplan Activities haven't worked well' slow-onset events are mentioned explicitly (UNFCCC 2019). This includes the notion that, 'There has been no particularly impactful activity on the slow-onset event activities, the database has been the biggest one' (UNFCCC 2019). The 2019 review in Article 24 consequently stresses 'the importance of enhancing the work on slow onset events and non-economic losses associated with climate change impacts' (2/CMA.2). The expert group on slow-onset events was finally launched during the last ExCom meeting (October 2020). The group provides an opportunity to fill these gaps and also to develop activities that help to better fulfil the WIM's 'action and support' function regarding slow-onset processes.

What are key gaps and challenges in addressing losses and damages from slow-onset processes?

The analysis revealed a number of gaps and challenges in adequately addressing losses and damages due to slow-onset processes at the national and international levels. These include all decisions on such processes having to be made under considerable uncertainty. For sea level rise, uncertainty exists regarding the amount, the costs and prioritisation of adaptation action, and the implications of taking no action. Risks and disasters also compete for media and political attention and resources. Slow-onset processes often fail to secure the type of public and political engagement frequently given to highly destructive and sudden disasters.

The above challenges contribute to what researchers often describe 'early warning, late response' behaviour, due to a lack of institutional frameworks and responsibility, and to fragmented responses. The analysis also found a number of gaps in adequately addressing loss and damage due to slow-onset process. A key gap is the lack of and/or insufficient data and knowledge (e.g. based on long-term monitoring of processes). This hinders defining the: (a) impacts of slow-onset processes at the local level; (b) point in time when impacts become harmful for ecosystems, societies, and/or economies; and (c) amount of resources needed to address losses and damages from slow-onset hazards.

Adequate reactions are also hindered by slow-onset processes often not being well integrated into climate risk management at the national level. This is also due to conceptual gaps in the climate risk management cycle's concept. Finally, a frequently mentioned gap in adequately addressing such loss and damage – reported both by interviewees and in the literature – is insufficient financing and the lack of adequate financial tools and instruments. This gap was also highlighted during the 2016 Forum of the Standing Committee on Finance on financial instruments addressing the risks of loss and damage. The Forum concluded that, 'a major gap exists in addressing slow-onset events, because current approaches are more suited to extreme weather events and other rapid-onset events' (UNFCCC/CP/2016/8).

INTRO DUCTION

What is the background of this paper and the series?

The effects of climate change can be divided into two categories according to the temporal scale over which they occur and the differing speed of manifestation of their impacts. There are rapid-onset events, typically referred to as extreme weather events in the climate context (e.g. cyclones and heatwaves). Meanwhile, there are slow-onset processes unfolding slowly and gradually over years, decades, or centuries (e.g. sea level rise, ocean acidification, and desertification). Both types of events substantially impact people's lives, cause loss and damage, hinder enjoyment of human rights, and drive human mobility. The first priority should therefore be to prevent or minimise this potential damage through effective mitigation, adaptation, and risk-reduction measures. Prevention or minimisation of all loss and damage is, however, no longer possible; climate change is already leading to unavoidable losses and will increasingly do so in the future. Taking this into account, it appears essential to address the unavoidable residual loss and damage, especially those for countries particularly vulnerable to climate change impacts.

In contrast with extreme weather events, addressing losses and damages caused by slow-onset processes is still neglected in the climate change context, both at the national and international levels.

Neglecting the issue undermines the scale of the challenge. Scientists conclude that in the long term, more people will be affected by slow-onset processes than by extreme weather events. The example of sea level rise (SLR) effectively illustrates the problem's global dimension. By 2050, sea level rise will threaten 300 million people living in low-lying coastal areas as they live on land below projected annual flood levels (Kulp/Strauss 2019). Estimates of global economic losses from coastal flooding due to SLR amount to > 4 % of world GDP (Schinko et al. 2020). For low-lying developing countries and Small Island Developing States (SIDS), however, its effects will be particularly severe, and in some cases existential. Based on current greenhouse gas emissions, researchers assume most atolls will become uninhabitable before the mid-21st century. Already today, SLR is causing substantive non-economic losses. In Senegal, our case study country, the effects of sea level mixed with other anthropogenic factors are threatening the World Heritage Site of Saint-Louis. Other communities are already submerged, despite adaptation measures. Thousands of people have already been displaced, and many more will follow in the future. Of Saint-Louis territory, 80 % will be at risk of flooding by 2080 and 150,000 people will have to relocate (Government of Senegal/World Bank 2013). Most of West Africa's coastal cities, home to 105 million people, face a similar threat.

Despite this urgency, the political Loss and Damage[1] debate on national and international level and related measures to address losses and damage often still have a focus on dealing with the impacts of extreme weather events. A number of gaps and challenges in coping with and managing slow-onset processes and related loss and damage can explain this. These include a lack of common understanding of the terminology related to slow-onset processes, and a lack of data and knowledge on the losses and damage slow-onset processes cause (particularly at the local level). These also include a lack of clarity about the question of how countries currently deal with these losses, and finally a lack of clarity regarding adequate measures to deal with losses and damage from slow-onset processes. The IPCC Special Report on the Ocean and the Cryosphere thus states that, "[m]ore work is needed to explore the range of activities available to respond to L&D [loss and damage] resulting from slow onset processes in the scope of the SROCC report (...)" (IPCC 2019a: 630).

What is the objective of the paper series on addressing losses and damages from slow-onset processes?

This series responds to the above-described challenges. The first paper introduced slow-onset processes and resulting losses and damages. This second paper analyses the status quo, challenges, and gaps in addressing losses and damages from slow-onset processes at the national and international levels. Finally, the third paper will analyse financial tools and instruments to address losses and damages from slow-onset processes. Through the analyses, we seek to foster awareness of the urgency to act in this area, and provide input for processes at the national and international levels. This is with the aim of finding tangible and feasible solutions to address loss and damage from slow-onset processes. The series is prepared in the context of the 'Multi-Actor Partnership

1 For a definition of loss and damage see key facts and definitions from part I, "Slow-onset Processes and Resulting Losses and Damages – An introduction," on page 4. We use the term 'loss and damage' or 'losses and damages' (lowercase letters) to refer to harm from adverse effects of climate change and 'Loss and Damage' (capitalized letters) for the political debate, particularly under the UNFCCC (see e.g. IPCC 2019a).

on Climate and Disaster Risk Financing'[2] project. It includes a case study from the partner country Senegal and contains insights from the other partner countries of Malawi, Madagascar, Laos, the Philippines, and Sri Lanka.

What does this second part 'National and International Approaches to Address Loss and Damage from Slow-onset Processes' cover?

This second part of the series starts with an analysis of different approaches and measures for addressing loss and damage due to slow-onset processes. Subsequently, it analyses the status quo of this addressing at the national level, looking at Senegal. It adds insights from interviews with civil society representatives from Malawi, the Philippines, Sri Lanka, Madagascar, and Laos. The status quo is then analysed at the international level. We describe how the issue is reflected under the UNFCCC, with a special focus on the WIM, show how other international frameworks address slow onsets, and analyse differences at the international level in addressing losses and damages owing to sea level rise. Finally, we describe challenges and gaps in adequately addressing slow-onset-related losses and damages.

2 The Multi-Actor-Partnership on Climate and Disasters Risk Financing in the Context of the InsuResilience Global Partnership project is carried out by a consortium of civil society organization. The main focus of the project is capacity development and the establishment/expansion of multi-actor dialogue platforms at national and global levels in order to promote the development and implementation of gender-equitable, poverty-oriented and human rights-based approaches to climate risk financing. The project is carried out in Malawi, Madagascar, Laos, Philippines, Sri Lanka, Senegal, Caribbean by implementing partners from the project countries. The overall coordination is led by CARE Germany with Germanwatch and Munich Climate Insurance Initiative (MCII). The project is supported by Engagement Global with funding from the German Ministry for Economic Cooperation and Development. For more information and a detailed project summary see: https://careclimatechange.org/multi-actor-partnership-climate-and-disaster-risk-finance-in-the-context-of-the-insuresilience-global-partnership-igp/.

APPROACHES & MEASURES TO ADDRESS LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES

Comprehensive CRM is often used to as an approach for managing the risk of loss and damage and addressing actual loss and damage. The risk management cycle is a key concept in climate and disaster risk management. It includes the five key steps of risk assessment: risk reduction, risk retention and transfer, preparedness, response, and recovery (see, for example, Le Quesne et al. 2017). The cycle applies a phase logic with a linear disaster sequence including a clearly definable beginning and end (Staupe-Delgado 2019). This includes the notion of an ex-ante phase for risk reduction and preparation, an impact, and an ex-post phase for recovery. This logic has helped shift the focus of disaster risk management activities to mitigation and preparedness (ibid.). Existing CRM approaches (see, for example, Le Quesne et al. 2017) do not, however, effectively cover risks and impacts brought by slow-onset processes. This can partially be explained by the linear logic of the cycle being difficult to apply to slow-onset processes that gradually manifest, have ongoing effects, and where it is challenging to define a clear beginning and end.

Slow-onset processes and their impacts gradually manifest over long timespans. Coping with impacts

becomes a continuous activity for parts of societies, such as those living along coastlines that get slowly inundated. In this way, the ex-ante and ex-post logic is challenging to apply. Activities such as rebuilding coastal infrastructure to secure functional persistence of a community may no longer be possible from a certain, unknown point in time onwards.

The conceptual gap can also be explained by the concept of disasters often being equated with rapid onset events and defined by factors of acuteness, urgency, or vast destruction (Staupe-Delgado 2019). Initial steps are being made in addressing this conceptual gap. For example, the National Institute Of Disaster Management India (NIDM) and the German Agency for International Cooperation (GIZ) (2019) developed a climate risk management process for assessing loss and damage, and that considers rapid-onset events and slow-onset processes. It aims at identifying risk management options and includes an assessment of the impacts and risks for the system of interest; a risk evaluation to identify acceptable, tolerable, and intolerable risks; and the development of options to avert, minimise, and address potential climate-related loss and damage based on risk tolerance assessments (NIDM/GIZ 2019). The approach includes a learning framework that allows identifying of appropriate actions and adjusting them over time based on increased knowledge (ibid.). These ideas are a good first step in addressing slow-onset processes with climate risk management. Their applicability to different slow-onset processes, however, still needs to be tested on the ground to reveal if it can effectively support countries and communities. Particularly, the step of implementing identified options needs to be further detailed, considering the challenge that managing impacts due to slow-onset processes has become a continuous activity for communities.

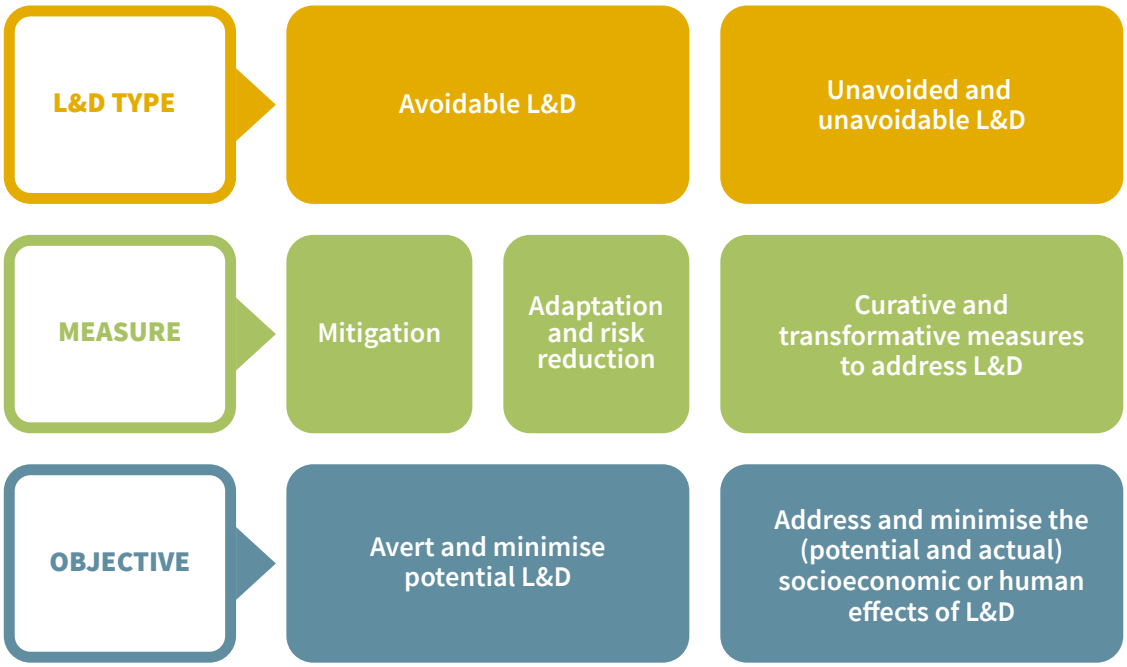
With a view towards concrete measures for dealing with loss and damage, the differentiation in averting, minimising, and addressing[3] concept anchored in the Paris Agreement can be useful. Losses and damages are determined by the level of preventive action, both through reducing greenhouse gas emissions and by adaptation and disaster risk reduction measures to reduce vulnerabilities and build resilience. Consequently, one essential element to avert and minimise avoidable loss and damage is effective strategies for mitigation, adaptation, and disaster risk reduction. It is no longer possible, however, to prevent or minimise all loss and damage – historical greenhouse gas emissions and investments locked into fossil fuel industries have already committed us to a certain level of climate impacts. Moreover, not all climate change impacts can be successfully adapted to, whether because of financial, technical, or physical constraints.[4] Hence, climate change will lead to loss and damage induced by extreme weather events, as well as slow-onset changes, and will increasingly do so in the future. The other essential element of loss and damage measures therefore includes strategies to address and minimise unavoided or unavoidable loss and damage. Figure 1 shows the different types of measures for dealing with loss and damage.

The following image is a simplified schematic representation. In reality, there is a grey area with regard to categorising measures as either adaptation or loss and damage. The following provides a more detailed explanation of measures to avert, minimise, and address loss and damage.

3 In the Paris Agreement, Parties recognise the importance of averting, minimising, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events (…). Article 8 of the Paris Agreement and Decision 1/CP.21 Paragraphs 48–52(FCCC/CP/2015/L.9/Rev.1.)

4 The IPCC (2014) differentiates between hard adaptation limits (those that will not change, for example, thresholds in physical systems or exceedance of the physiological capacity of individual organisms or communities to adapt to changes), and soft adaptation limits (which could change over time; such as economics, technology, infrastructure, laws and regulations, and broader social and cultural considerations).

Figure 1: Categorisation of loss and damage measures



Source: Author. Classification of avert, minimise, and address based on FCCC/CP/2015/L.9/Rev.1. Differentiation between curative and transformative measures based on Mechler/Schinko (2016)

Averting and minimizing avoidable loss and damage

TMitigation, adaptation, and risk reduction measures are key in averting and minimising avoidable loss and damage. According to Climate Tracker, the Nationally Determined Contributions under the UNFCCC are not consistent with a 1.5 °C goal, but instead lead to approximately 4 °C warming.[5] Current mitigation commitments therefore need to be substantially ramped up to keep global warming within 1.5 °C and prevent unmanageable climate change.

Adaptation and risk reduction measures as a second part of the measures to avert and minimise loss and damage from slow-onset processes include a variety of measures that need to be tailored to the specific processes and therefore differ widely. Potential adaptation and risk reduction measures for sea level rise include (IPCC 2018, OECD 2019):

- **Monitoring sea level rise**
- **Risk assessment**
- **Protection** (by blocking inland propagation and other effects of mean or extreme sea levels hazards (e.g. through dikes, seawalls, storm surge barriers, breakwaters, and beach dune systems)
- **Advance** (creates new land by building seawards (e.g. reclamation of new land above sea levels or planting vegetation with the specific intent of supporting natural accretion of land)
- **Early warning systems**
- **Ecosystem-based adaptation** (combination of the benefits of protecting and advancing strategies based on conservation and restoration of ecosystems such as reefs and coastal vegetation)
- **Accommodation** (includes a diverse set of biophysical and institutional responses to reduce

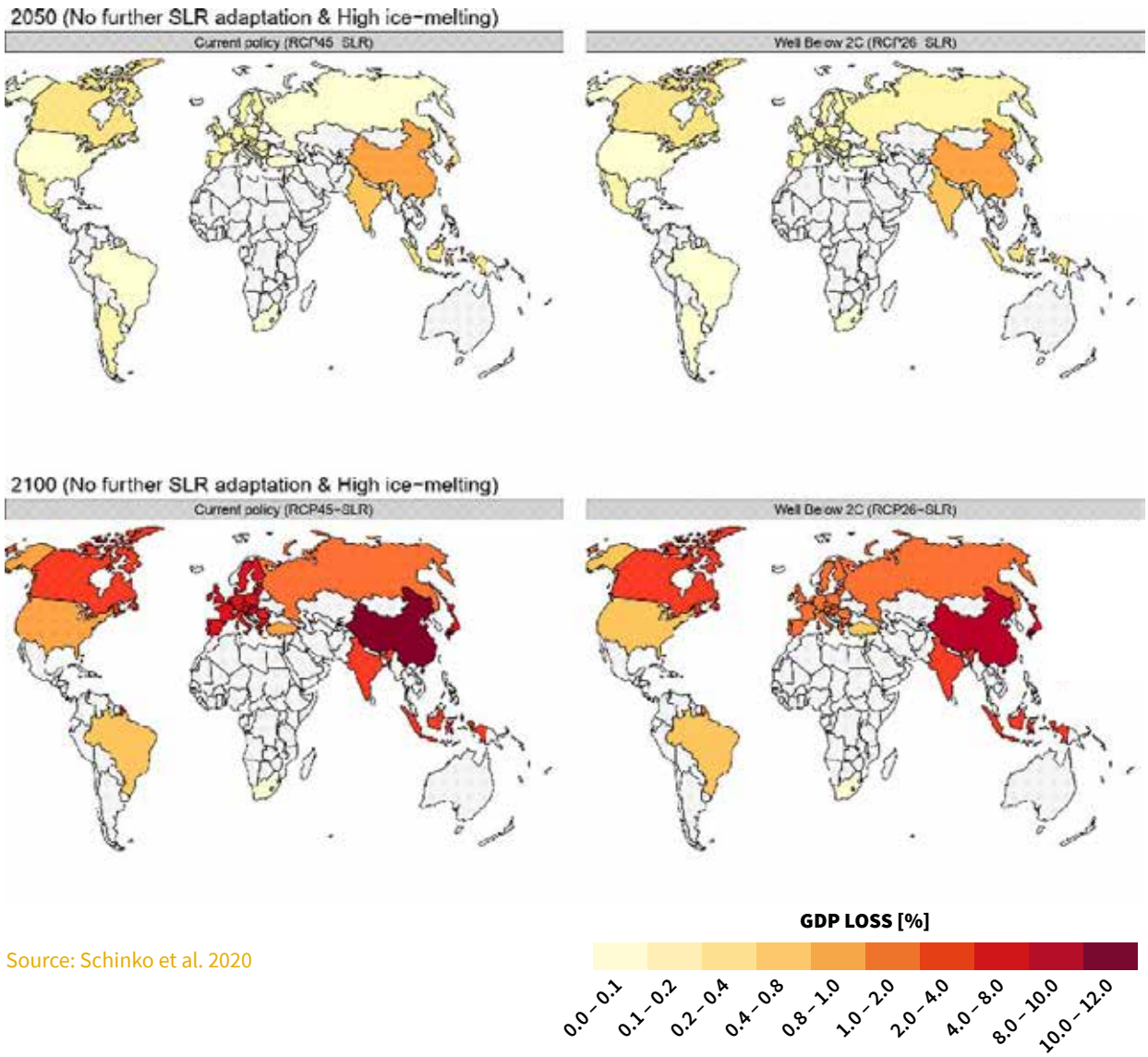
5 https://climateactiontracker.org/

vulnerability of coastal residents, human activities, ecosystems, and the built environment (e.g. raising buildings, planting salt tolerant crops, insurance, and early warning systems for extreme sea level events)

- **Retreat** (reduces exposure to coastal hazards by moving people, assets, and human activities out of the exposed coastal area)

The case of sea level rise clearly shows why effective mitigation and adaptation measures should be the first priority in preventing or reducing economic and non-economic losses and damages. A recent study (Schinko et al. 2020) found that, by 2100, annual global economy-wide losses could amount to > 4 % without further mitigation and adaptation, and assuming continued sea level rise. The model results show that with ambitious mitigation and adaptation, this number can be reduced to < 0.5 % of global GDP loss, despite the associated costs for adaptation measures and residual impacts (ibid.). Adaptation, through enhanced protection, can reduce these costs by two to three orders of magnitude. This would show substantial benefits across all scenario combinations (OECD 2020). For large parts of the world, coastal protection, therefore, is economically attractive regardless of how SLR and socio-economic development proceed (ibid.).

Figure 2: GDP loss due to sea level rise



Source: Schinko et al. 2020

Addressing unavoided and unavoidable loss and damage

Measures to address loss and damage concern climate change impacts expected to materialise or that have materialized as mitigation or adaptation will not/have not prevented or minimised them. While mitigation and adaptation can avert loss and damage, measures themselves are not expected to fully prevent these impacts (Mace/Verheyen 2016).

Mechler/Schinko (2016) introduced the differentiation between curative and transformative loss and damage measures. They saw curative measures to be applied when "technical and feasible risk reduction becomes limited over time" but note that the space for these measures is "much less clear (…) owing to the fact that it overlaps largely with demands for compensation (…) and because of existing limitations in the causal attribution of losses and damages to anthropogenic climate change." (Schinko et al. 2018: 99). From our perspective, curative loss and damage measures should aim at addressing and minimising the (potential) socio-economic and/or human effects of adverse climate change impacts. Transformative measures are applied "when limits to structural protection or other adaptation measures to manage climate-related risks are reached" (ibid.: 99). These measures are complementary to DRR and adaptation measures. From our perspective, they therefore address and minimise (potential) loss and damage.

Both types of measures need to cover economic and non-economic losses and damages. Table 1 examines specific measures.

Table 1: Exemplary measures to address loss and damage from slow-onset processes – sea level rise

Curative measures	Transformative measures
Economic loss and damage	**Economic losses**
■ (Support for) setting up or scaling up financial protection measures to increase financial resilience (pre-arranged funding when impacts happen to protect fiscal balance, subnational governments, households, and businesses)	■ Support for voluntary migration (including planned relocation if areas can be foreseen as no longer inhabitable or manageable, and safe alternative localities are available)
■ (Support for) setting up or scaling up social protection schemes	■ Support in building up alternative livelihood provisions for people who can no longer, for example, fish because of sea level rise

Curative measures	Transformative measures
Economic loss and damage *(continued)* ■ Recovery and rehabilitation, (e.g. based on financial protection measures, applicable for areas that are not permanently submerged but affected from more frequent high sea level events), including, for example: ☐ (Support for) rebuilding of coastal infrastructure that has been destroyed or ☐ (Support for) rebuilding of livelihoods ■ Support for involuntary climate-induced displacement and forced migration ■ Capacity building **Non-economic loss and damage** ■ Recognition of loss (accompanied/unaccompanied by financial payments) ■ Active remembrance (e.g. through museum exhibitions, school curricula) ■ Counselling ■ Official apologies	

Source: Author. Measures taken from ExCom 2019, Schinko et al. 2018, IPCC 2019 and Wallimann-Helmer et al. 2018

The above table does not claim to be exhaustive and the IPCC Special Report on the Oceans and Cryosphere legitimately notes that "[m]ore work is needed to explore the range of activities available to respond to L&D [loss and damage] resulting from slow onset processes in the scope of the SROCC report (...)" (IPCC 2019a: 630). Other actors have also noted this gap. The GIZ, for example, includes in its recommendations fostering a comprehensive approach to climate risk management to "Identify gaps and expand the set of effective CRM measures to address risks, for example, on approaches on how to better deal with L&D from slow onset changes, tools to deal with non-economic L&D or innovative instruments to finance CRM-measures" (GIZ 2019: 6).

STATUS QUO OF ADDRESSING LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES AT THE NATIONAL LEVEL

Section “Approaches and measures to address loss and damage from slow-onset processes” (page 12 et seq.) describes approaches and measures to avert, minimise, and address loss and damage due to slow-onset processes. Based on the classification introduced, this section analyses how countries are currently addressing loss and damage. In a first step, we present results from our country case study, Senegal[6]. We then summarise results from interviews conducted in the context of the ‘Multi-Actor Partnerships for Climate Risk Financing’ project, with civil society representatives from Malawi, the Philippines, Sri Lanka, Madagascar, and Laos, and supplement them with findings from a literature review.

6 ENDA conducted the following country case study based on a review of all available documents and resources. However, Covid-19 framework conditions made additional interviews challenging. Additional information will be provided for the third paper of the series. Comments are welcome.

STATUS QUO OF ADDRESSING LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES IN SENEGAL

Country context

Senegal, listed among the lower middle income countries group, in 2019 had per-capita GDP of US $23.578 trillion.[7] Although the country has seen development progress in recent years, nearly 70 % of Senegalese live in multidimensional poverty (Zamudia/Terto 2016). Moreover, the country's economy largely depends on climate-sensitive sectors, including agriculture, livestock, and fisheries (ibid.). These factors combined increase Senegal's climate change vulnerability. In the Notre Dame Global Adaptation Index, Senegal is ranked among the countries with a high vulnerability score and low readiness score for adaptation actions.[8] SLR, temperature increase, ocean acidification and related impacts, salinisation, land and forest degradation, biodiversity loss, and desertification are the key slow-onset processes observed in the country.

The first paper ('Slow-onset Processes and Resulting Losses and Damages – An introduction') in this series detailed how slow-onset processes have affected Senegal, and the types of losses and damages that result from the special case of sea level rise. This second paper takes a closer look at how the country is currently dealing with the resulting loss and damage. It sheds light on the questions of:

- Who is responsible for addressing loss and damage due to slow-onset processes in Senegal?
- How is avoidable loss and damage minimised and addressed with adaptation and risk reduction measures?
- How is unavoided loss and damage addressed?
- What are the gaps and challenges?

Who is responsible for addressing loss and damage due to slow-onset processes in Senegal?

Senegal has set up a national framework for climate governance and for disaster risk management. Losses and damages due to slow-onset processes thematically fall under the responsibility of the following entities:

- The Directorate for the Environment and Classified Establishments (DEEC), under the supervision of the Ministry of the Environment and Sustainable Development (MEDD), which has been the focal point for the UNFCCC since 1992, and for the Global Environment Facility (GEF), Clean Development Mechanism (CDM), Adaptation Fund, and Green Climate Fund. The DEEC also established a Climate Change Division in 2000.
- The National Climate Change Committee (COMNACC), created and operational since 1994, was the subject of ministerial order number

7 https://data.worldbank.org/country/senegal.
8 https://gain-new.crc.nd.edu/country/senegal

1220 of 7 March 2003 and has evolved following its establishment by decree number 2011-1689 of 3 October 2011. It is a framework that brings together all the actors involved in climate change issues (technical administrative services, private sector, NGOs, civil society, research structures, universities, etc.). COMNACC plays an essential role in providing scientific and technical advice, training, awareness-raising, monitoring, and coordination of activities performed under the framework of the convention's implementation. Thematic groups such as that on climate finance and other mechanisms to better accompany the CED and the sectors in mastering this perspective, and specialised platforms such as the National Platform for Fisheries and Climate Change (PNPCC) and the CCASA (Climate Change Agriculture and Food Security) are set up at the COMNACC level to better accompany these sectors. At the decentralised level, the regional climate change committees (COMRECC), as the regional counterpart of COMNAC, have been created.

- The Ecological Monitoring Centre (CSE, Centre de Suivi Ecologique), a national entity for implementing the Adaptation Fund (AF) and the Green Climate Fund, administers grants.
- The Civil Protection Directorate who is leading the national disaster risk management framework. The country has also established a high-level Civil Protection Commission and a national platform for disaster risk prevention and reduction.

Averting and minimising loss and damage with adaptation and risk reduction measures

Senegal has established a number of adaptation strategies and policies that address slow-onset processes. In the Emerging Senegal Plan, the State of Senegal has included measures to deal with slowly evolving climatic hazards' effects. In 2006, Senegal submitted its National Adaptation Programme of Action (NAPA) to the UNFCCC. This identifies water resources, agriculture, and coastal zones as the country's most vulnerable sectors. In 2015, Senegal launched its National Adaptation Plan (NAP) process, identifying water resources, agriculture, and coastal zones as priority areas for adaptation. A NAP is currently being formulated. In the process, specific adaptation objectives with regard to the eight sectors of biodiversity, coastal zones, water resources, fisheries, agriculture, livestock, flooding, and health were identified. Adaptation objectives were also communicated in Senegal's Intended Nationally Determined Contribution (NDC) in 2020. They include a) Strengthening the observation networks and collection of climatic, oceanic and coastal data; b) Strengthening the resilience of ecosystems and production activities; c) Ensuring the health, well-being and protection of populations against risks and disasters related to extreme events and climate change (Republique du Senegal 2020). The NDC also includes a list of priority adaptation actions summarized in table 2 with view to relevant actions for slow-onset processes.

Table 2: Selected priority adaptation actions in Senegal with focus on slow-onset processes (2 °C scenario)

Summary of priority adaptation actions in Senegal for selected areas
Agriculture
■ Early warning system ■ Sustainable Land Management (defense and restoration of degraded lands; restoration of organic fertility of soils; agroforestry...) ■ Recovery of saline lands ■ Use of adapted varieties (short cycle and temperature)Promotion of integrated agriculture-livestock-agroforestry production systems ■ Strengthening of resilience through diversification of production systems (improvement of food security and nutrition. ■ Adopt varieties that are tolerant to high temperatures, submersion, salinity, and an increase in the atmosphere's CO2 content ■ Promote agricultural insurance to reduce small producers' vulnerability and ensure food security in rural areas
Flood risk and disaster management
■ Implementation of the national land use plan and master plans ■ Urban restructuring and relocation of priority areas ■ Strengthening of sanitation infrastructure and rainwater drainage systems in cities
Coastal areas
■ Integrated Coastal Zone Management (implementation of a coastal monitoring system, identification of forcing factors and physical processes that govern the functioning and dynamics of the coastline, updating of the legal and institutional framework of the coastline, morphodynamic modelling of the coastal zone, identification of the main coastal hazards and risk areas, planning of coastal occupation, etc.) ■ Protection and development of risk areas and restoration of degraded coastal ecosystems ■ Identification of adaptation issues ■ Regulation of coastal occupation
Biodiversity
■ Strengthening the knowledge base on biological diversity in relation to climate change impacts ■ Strengthening ecosystem resilience

Summary of priority adaptation actions in Senegal for selected areas

Fishing

- Sustainable management of fisheries resources and restoration of marine habitats;
- Improved management effectiveness and expansion of marine protected areas and marine parks (10 MPAs by 2025)
- Promotion of sustainable aquaculture development;
- Improved safety of fishing communities and fisheries-related infrastructure
- Restoration and sustainable management of mangroves

Source: Author, based on Republique de Senegal 2020

The overview shows that Senegal addresses different slow-onset processes as part of its adaptation strategy and thereby tries to minimise the risk of loss and damage. Being aware of technical and knowledge gaps, the NDC also notes that "the proper execution of the commitments will require the strengthening of technical means (regular system of quantitative and qualitative data collection), technological means (appropriate equipment) and human means (strengthening knowledge and updating curricula)" (Republique de Senegal 2020).

Senegal has also set up a national framework for advancing disaster risk management under the leadership of the Civil Protection Directorate. The country has established a high-level Civil Protection Commission and a national platform for disaster risk prevention and reduction. With UNDP support, it has also developed a National Programme for Disaster Risk Reduction (Zamudia/Terto 2016). Additionally, the government has developed a 10-year Flood Management Program (2012–2022), aiming at preserving human lives and reducing floods' negative economic and environmental impacts. With more than 750 billion CFA-Franc, the flood management program is structured around four essential components. These are improvement of knowledge of flood zones, rehousing of affected populations, planning and development of cities, and an important aspect relating to strengthening cities' resilience, which consists of, among other things, realisation of rainwater drainage works (ONAS 2018).

An analysis of the Organisation for Economic Co-operation and Development (OECD) Rio Markers, which reports on climate-related official development assistance from multilateral and bilateral sources, discloses that Senegal received US$188.8 million in funding from bilateral donors in 2010–2013 for projects that had a principal or substantial focus on climate change adaptation (Zamudia/Terton 2016). The vast majority of bilateral aid contributing to adaptation is classified as multisectoral, followed by water supply and sanitation. Coastal zones, freshwater, agriculture, fishing, forestry, and human health, despite having been identified as key vulnerable sectors regarding climate change, have received relatively low attention according to the OECD Rio Markers (Zamudia/Terton 2016).

As noted, adaptation and disaster risk reduction measures should be the first priority in preventing or reducing economic and non-economic losses and damages. However, also for the case of Senegal, it will

no longer be possible to avert or minimise all potential loss and damage through adaptation measures. Concrete policies and strategic measures are needed to address losses and damages resulting from slow-onset processes.

Addressing and minimising loss and damage with curative and transformative measures

Curative measures

Evidence for curative measures by the Senegal government's action can be found regarding climate-induced displacement and forced migration. For the case of the city of Saint-Louis (see paper 1 for problem description), the government has initiated its emergency response mechanism under the leadership of the central governor and the municipality. Affected families who lost houses in the 2017 storm surge were initially provided shelter in local schools. A relief camp (Khar Yalla) was then set up (World Bank 2018). The location, however, is in a flood-prone area and families in the camp are living in crowded tents with no sanitation services and inadequate access to water, electricity, and transport. The municipality began addressing difficult living conditions of the displaced population through better access to potable water and electricity (ibid.).

Mix of curative and transformative measures

Evidence of measures that are both curative and transformative can again be found with a view to support for displacement and migration. With damage now unavoidable, Senegal's government and the World Bank are mobilising to resettle nearly 10,000 people from the riskiest zone of Saint-Louis. In 2018, the World Bank approved an International Development Association credit of US $30,000,000. This was to give direct support to 927 households of nearly 10,000 people in Saint-Louis and who had already been displaced by coastal erosion or were amongst the most vulnerable people currently living within the 20-m zone considered at very high risk of flooding (World Bank 2018). According to the World Bank, the 5-year project has adopted an inclusive, participatory approach towards plans for relocating the affected communities by ensuring active involvement of local communities throughout the project cycle (ibid.). The project's objective includes strengthening existing community networks, promoting the sense of ownership and solidarity within communities, and providing an opportunity to build overall community resilience against future disaster risks and climate change (World Bank 2018). Saint-Louis has identified a few potential plots to which the 10,000 people at risk or already displaced could move, and is negotiating with neighbouring communes for the land (Peyton 2018). In the best-case scenario, houses could be built, and people relocated, within 2 years (ibid.).

Saint-Louis, however, is not the only community facing the risk of submergence. Other communities along the Senegal coastline and in other West African countries are also impacted. To deal with the larger problem, the World Bank launched the West Africa Coastal Areas Management Program, with a first funding round of about $220,000,000. The money will be used to build sea walls and other defences, plant vegetation along shores, and support communities. The World Bank, however, already states that resources will 'not be enough to move everyone out of harm's way' (Payton 2018).

Financial instruments and tools in the context of curative and transformative measures

For recovery and rehabilitation (e.g. for rebuilding coastal infrastructure or livelihoods), the main funding tools are the national budget and dedicated funds and projects and programmes funded through bilateral and multilateral mechanisms. For the budget, there is generally no line within it dedicated to managing the effects of slow-onset processes (ENDA based on interviews 7–10). This is also linked to the lack of monitoring on slow-onset processes; for instance, flooding to date due to sea level rise is not well documented in Senegal (ibid.). At the level of the Directorate for the Environment and Classified Establishments, more precisely at the Coastal Management Division, however, a budget line for investment dedicated to the fight against coastal erosion is voted on annually. It varies between US $600,000 and $1,000,000 on average.

Nevertheless, given the high cost of actions to combat coastal erosion, the budget for the Division remains low. As a result, rather limited-scale activities are carried out, such as reforestation of mangrove swamps in several deltaic areas of Senegal (ENDA based on interviews 7-10). The Senegal government has also performed beach silting in Gandiol, more precisely in Pilote Bar. In 2019, thanks to silting activities, a strip of land 1.5 km long vs. 700 m in 2015, and 100 m wide vs. 20 m in 2015, was built. These results are known thanks to the Littoral Division's monitoring.

Senegal also has several funds for financing climate projects and post-disaster action. These include a calamity fund (created in 1997) and national solidarity fund (in 2002), as well as the security fund. The World Bank however found that "funds allocated are small in the context of potential losses and rules of access to the funds are unclear. Allocations to these funding mechanisms are not informed by quantification of potential disaster losses" (World Bank 2012). Moreover, these special contingency funds can be accessed for multiple purposes and may already be deplete in case of an event (ibid.). Moreover, the emergency plan (ORSEC Plan), originally set up to address the effects of rapid-onset climatic hazards, could potentially also cover loss and damage due to sea level rise. The Plan is an emergency disaster relief mechanism that, to date, has mainly been used to fight flooding. It is generally only funded when floods or disasters occur. This explains why it operates episodically. In 2015, the MEDD set up the National Climate Fund with the objective of mobilising US $60,000,000/year to finance climate projects, primarily based on international sources such as the Green Climate Fund (GCF).

In parallel to this state funding, it should be noted that multilateral funding with the Global Environment Facility (GEF), Adaptation Fund (AF), and GCF, and bilateral funding to combat the impacts of climate-related hazards such as coastal erosion, salinisation of land and water resources, loss of biodiversity, desertification, and reduced yields due to rising temperatures are being mobilised in the form of projects and programmes. It should be stressed that, additional to this public funding, a large part of the funding for the fight against the impacts is paid for by households (ENDA based on interviews 7–10). This financial contribution to climate action is, however, not well understood (ibid.).

Gaps and challenges

Although some curative and transformative measures could be identified for Senegal, a systematic approach for adequately addressing loss and damage due to slow-onset processes could not. From a technological perspective, most measures proposed in policy and strategy documents address rapid-onset climate hazards rather than slow-onset processes. Slow-onsets are only substantially taken into account in the coastal zone sector. The weakness of domestic financing is one of the most important challenges in financing the fight against the impacts of slow-onset climate hazards (ENDA based on interviews 7–10). Also notable is that most funds the Senegal government has set up are not operational. Some, such as the ORSEC Plan, are functional, but there is no formal strategy for financial provision (ibid.). The ORSEC Plan resources are used almost exclusively to address the effects of rapid-onset climatic hazards, such as flooding.

Although evidence for curative and transformational measures for migration and displacement could be identified, thus far there are also no formal mechanisms to manage forced or planned retreat due to sea level rise (ENDA based on interviews 7-10). An interviewee from the Executive Secretariat of the National Council on Food Security stated that, "If there is a disaster due to sea level rise, in a hurry the State is supposed to seek for temporary shelters for the impacted people, while setting a relocation plan of the communities in another site. However, in practice if there is flooding due to sea level rise, and the communities are forced to leave their houses, they are temporarily relocated in public infrastructures such as schools, while waiting for their families or parents to find ad hoc relocation solutions" (interview 6).

INITIAL INSIGHTS FROM OTHER COUNTRIES ON ADDRESSING LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES

In other countries, we find similar patterns in addressing loss and damage caused by slow-onset processes to the ones reported from Senegal. We conducted interviews with civil society representatives from Malawi, the Philippines, Sri Lanka, Madagascar, and Laos in the context of the Multi-Actor Partnerships for Climate Risk Financing project. The following summary does not aim to provide a comprehensive picture of the status quo or a complete list of relevant measures for the countries listed above. The interviews' objective was to acquire an initial impression of how the topic is treated in different countries, and an idea of types of measures to address loss and damage that are applied. Further comprehensive research including interviews with all relevant stakeholders (public, private, and academia, as well as civil society) would need to be conducted for valid statements on the status quo of addressing loss and damage due to slow-onset processes in these countries.

All interviewees unanimously reported that political decision makers are aware of the slow-onset processes and adaptation and risk reduction measures are being implemented. Despite implementation gaps, countries try to address the risk slow-onset processes and their impacts pose for key economic sectors, particularly agriculture. Sri Lanka is a good example of how countries try to avert and minimise potential impacts (in this case land and forest degradation, salinisation, desertification, loss of biodiversity, temperature increase, and sea level rise) through a number of policies and plans mainly focused on adaptation. These include the National Adaptation Plan 2016-2025, Nationally Determined Contributions (including a commitment to create a national mechanism under the WIM), new Overarching Agriculture Policy, Strategy for Sustainable Development, National Action Programme for Addressing Land Degradation, National REDD+ Action Plan, National Biodiversity Strategic Action Plan 2016-2022, and Comprehensive Disaster Management Programme 2014-2018. Moreover, concrete projects address specific slow-onset process, such as the US $35 million World Bank-funded Eco-Systems Conservation and Management Project, and the US $52 million GCF-funded project, 'Strengthening the resilience of smallholder farmers in the Dry Zone.'

Almost all interviewees, however, reported gaps in implementing these plans and policies. From the Philippines it was reported that although "most people are aware what slow-onsets are, they are still far from the idea of implementation" (interview 2). Even though some slow-onset processes, such as sea level rise, are covered in climate change and disaster risk management plans, these plans are not effectively implemented at the local level. Similarly, a Madagascar interviewee reported that, "it's part of the political discussion but the results and the measures are not really working" (interview 4). An Malawi interviewee assumed that, "slow-onset hazards are not prioritised because they are politically not relevant; the management of rapids is more attractive. This might be a reason why they are not acting. For big disasters government is going to respond with big effort (…) mind-set changes need to happen" (interview 1).

A common challenge interviewees from different countries reported was the lack of/insufficient local data on different slow-onset processes and their local-level impacts. They reported that, although the general slow-onset process is known in their respective

countries, there is very little to no knowledge at the local level on impacts of, for instance, sea level rise for different parts of the country. It was highlighted that monitoring systems must be strengthened, generally for climate-related hazards but particularly for slow-onsets. For Sri Lanka, "the need for enhanced data is there, and scaling up monitoring systems would be needed to ensure that data is updated through different locations" was identified (interview 6). A Madagascar interviewee also highlighted the lack of an early warning mechanism for slow-onset processes.

Regarding support for curative[9] measures, most countries reported that loss and damage due to slow-onset processes was not addressed effectively and there was no effective related financial protection strategy for their countries' specific issues. In the Philippines, the People's Survival Fund could cover losses from sea level rise, but other than that, "there are no specific financing instruments for slow-onsets" (interview 2).

More initial insights into how countries are currently dealing with loss and damage from slow-onset processes can be found in a survey (Vanhala et al. 2020) conducted in Antigua and Barbuda; this investigated the interactions between knowledge and politics in governing loss and damage. Although some interviewees in that study mentioned slow-onset processes and related challenges in their management (data gathering, monitoring), the authors note that interviewees scarcely mentioned the topic. Regarding these processes, an interviewee from the Ministry of Finance even stated that he, "(…) thought of an expression that we would use … "First world problems"… because we have some very pressing issues" (Vanhala et al. 2020). The study concluded that slow-onset processes do "not feature in the construction of the [L&D] problem within this context," and explained the lack of prioritisation with the "current lived experiences of extreme weather events and resultant losses and damages."

9 The curative measures listed here under the curative category do not claim to be comprehensive. Moreover, sufficient information on transformative measures to address loss and damage could not be gathered based on the interview; we therefore refrain from making statements on this area here. A broader analysis would be needed for this purpose.

STATUS QUO OF ADDRESSING LOSS AND DAMAGE FROM SLOW-ONSET PROCESSES AT THE INTERNATIONAL LEVEL

How is the topic of slow-onset processes reflected under the UNFCCC?

Slow-onset processes have long been discussed under the UNFCCC. In 1991, the Alliance of Small Island States (AOSIS) proposed an international insurance pool, consisting of a collective loss-sharing scheme to compensate victims of SLR. This led to inclusion of references to slow-onset processes in preambular paragraph 12 of the UNFCCC. Additionally, preambular paragraph 19 describes characteristics of countries particularly vulnerable to adverse climate effects as "low-lying and other small island countries, countries with low-lying coastal, arid, and semiarid areas or areas liable to floods, drought, and desertification, and developing countries with fragile mountainous ecosystems" (UNFCCC 1992: 4f). All these characteristics correspond to slow-onset processes such as sea level rise, desertification, and biodiversity loss. The following timeline summarises UNFCCC decisions and milestones regarding slow-onset processes.

- The **Bali Action Plan (2007)** for the first time categorised climate impacts as either 'acute' or 'chronic.'
- The **Cancun Adaptation Framework (2010)** in the frame of COP16 for the first time in UNFCCC history made direct reference to the reduction of loss and damage 'associated with the adverse effects of climate change, including impacts related to […] slow onset events' (p. 6, Art. 25).
- The **establishment of the Warsaw International Mechanism on Loss and Damage (WIM) in 2013** was prepared by the outcomes of COP17 and COP18, which reflected and emphasised the need to increasingly strengthen cooperation, knowledge, measures, and management of the risks and consequences of 'slow onset events.' The interim Executive Committee of the WIM developed an initial **2-year workplan** in 2013, in accordance with decision 2/CP.19, paragraph 9. This contained nine Action Areas. Action Area 3 specifically dealt with 'slow onset events,' with the tasks of taking stock of organisations and establishing collaborative channels. The WIM ExCom was tasked with fulfilling these tasks by the end of 2016.
- The **Paris Agreement (2015)** built a new milestone for recognition of slow-onset processes. Article 8 recognised the importance to averting, minimising, and addressing loss and damage associated with, among other things, slow-onset events, for sustainable development. The agreement also called for enhanced cooperation and facilitation to increase understanding, action, and support in the areas of, among others, slow-onset events (Art. 8 [4c]).
- The first **5-year workplan on 'loss and damage' under the WIM** was approved in 2016. The workplan covers the topic of slow-onset processes in four workstreams (see below) and builds the formal frame to advance the topic under the UNFCCC in the near future.
- **COP23** (2017), which was marked by its Fijian presidency, again recognised in its outcomes the 'increasing impacts associated with slow-onset events, and the urgent need to avert, minimise and address these impacts through comprehensive risk management approaches: inter alia, through early warning systems, measures to enhance recovery and rehabilitation and build back and forward better, social protection instruments, including social safety nets, and transformational approaches.' Decision X/

CP.23 further requested an expert dialogue to 'explore […] information, inputs and views on ways for facilitating the mobilisation and securing of expertise, and enhancement of support, including finance, technology and capacity-building, for averting, minimising, and addressing loss and damage […] slow onset events, with a view to informing the preparation of the technical paper […], which deals with 'sources of financial support, as provided through the Financial Mechanism, for addressing loss and damage' (UNFCCC 2016: 6).

- In **2019**, the **review outcome of the terms of references (TORs) of the WIM** included several references to slow-onset events and non-economic losses associated with climate change impacts. The need for a corresponding experts group was stated and Parties were invited to enhance the 'support relevant for averting, minimising, and addressing impacts related to […] slow onset events, non-economic losses and human mobility and for comprehensive risk management […] under and outside the Convention […] including through operating entities of the Financial Mechanisms.'

Addressing loss and damage from slow-onset processes under the Warsaw International Mechanism

The WIM ExCom is the main body under the UNFCCC that deals with slow-onset process-related issues. It guides implementation of the mechanism's functions, which are, according to 3/CP. 18 (FCCC/CP/2012/8/Add. 1):

a) Enhancing knowledge and understanding

b) Strengthening dialogue, coordination, coherence, and synergies among relevant stakeholders

c) Enhancing action and support, including finance, technology, and capacity building, to address loss and damage

The topic of slow-onset processes has been included in the ExCom's work since its establishment and first workplan. In the initial 2-year workplan, it was addressed in Action Areas 3 and 5, with the objective to 'Enhance the understanding of the capacity and coordination needs with regard to preparing for, responding to and building resilience against loss and damage associated with extreme and slow onset events[10], including through recovery and rehabilitation' and to 'Enhance data on and knowledge of the risks of slow onset events and their impacts, and identify ways forward on approaches to address slow onset events associated with the adverse effects of climate

10 Note that UNFCCC uses the term slow-onset events which we find not appropriate to describe slow-onset processes (see publication part 1).

change with specific focus on potential impacts, within countries and regions' (UNFCCC/SB/2014/4). Within the 5-year rolling work plan, there are four workstreams that include the topic of slow-onset processes (UNFCCC/SB/2017/1/Add.1):

a) Enhanced cooperation and facilitation in relation to **slow-onset events**

b) Enhanced cooperation and facilitation in relation to non-economic losses (from extreme-weather events and **slow-onset events**)

c) Enhanced cooperation and facilitation in relation to comprehensive risk management approaches (including assessment, reduction, transfer, and retention) to address and build long-term resilience of countries, vulnerable populations and communities to loss and damage, including in relation to extreme and **slow-onset events**, among other things, through: emergency preparedness, including early warning systems; measures to enhance recovery and rehabilitation and build back/forward better; social protection instruments, including social safety nets; and transformational approaches

e) Enhanced cooperation and facilitation in relation to action and support, including finance, technology, and capacity-building, to address loss and damage associated with the adverse effects of climate change, such as **slow-onset events**.

Table 3 includes all ExCom activities since 2014 on the topic of slow-onset processes. These are analysed in terms of which of the three WIM functions they fulfil.

The list of activities shows the ExCom's focus regarding the topic of slow-onset processes clearly lied, and lies, in enhancing knowledge and understanding as well as strengthening dialogue. The WIM's third function, enhancing action and support, falls short – thus far, only three activities have been implemented or planned that fulfil this function. This finding is also reflected in the 2019 WIM Review that analysed the progress of the ExCom's workplan. In the breakout group discussion on the question of, 'Which ExCom workplan activities haven't worked well?' slow-onset events is mentioned explicitly (UNFCCC 2019). This includes the notion that '[t]here has been no particularly impactful activity on the slow-onset event activities, the database has been the biggest one' (UNFCCC 2019). The following gaps in the ExCom's work on slow-onset processes were mentioned during the discussion:

- Risk assessment – Methods and instruments that can assess loss and damage due to slow-onset events.
- Linkages between the workstreams on non-economic losses and slow-onset events is required.
- Development of a mechanism for technological support specifically to enhance resilience and plan for risks associated with slow-onset events and non-economic losses.

The 2019 review in Article 24 consequently stresses 'the importance of enhancing the work on slow onset events and non-economic losses associated with climate change impacts' (2/CMA.2). The expert group on slow-onset events was finally launched during the last ExCom meeting (October 2020). The group provides an opportunity to fill these gaps and also to develop activities that help to better fulfil the WIM's 'action and support' function regarding slow-onset processes.

The UNFCCC is not the only international framework addressing and discussing slow-onset processes. The following section looks into the different bodies and frameworks beyond the UNFCCC. We can already note here that the new ExCom working group would also provide an opportunity to align the ExCom's activities with other frameworks corresponding to the diverse set of slow-onset processes. The frameworks include the Land Degradation Neutrality under the United Nations Convention to Combat Desertification (UNCCD), Aichi targets under the Convention on Biological Diversity (CBD), and, crucially, the 2030 Agenda for Sustainable Development.

Table 3: Overview of ExCom activities on slow-onset processes

Overview of ExCom activities on slow-onset processes				
Coding according to the WIM's three functions **a** – Enhancing knowledge and understanding **b** – Strengthening dialogue, coordination, coherence, and synergies among relevant stakeholders **c** – Enhancing action and support – including finance, technology, and capacity building – to address L&D				
Activity	**Status quo**	**a**	**b**	**c**
Past activities				
Slow-onset events database	2015–present	■		
Work towards slow onset events (poster for the 8th Research Dialogue)	May 2016 (SB 44)		■	
Work towards catalysing further action (poster for the 8th Research Dialogue)	May 2016 (SB 44)		■	
Letter to the chair of the SBSTA requesting consideration of slow-onset events as a possible topic for the research dialogue to be held at SBSTA 44 or for future research dialogues	2016 (SB 44)		■	
Invitation to relevant organisations and experts to collaborate with the Executive Committee to facilitate access to information, including through collaborative channels or databases, and technologies to track the impacts, and enable approaches to address loss and damage associated with adverse effects of climate change, including slow-onset events	2016	■		
Photo campaign: What are you doing to address the risks of slow-onset events?	November 2017 (COP 23)		■	
Side event: Breaking new ground – Risk financing for slow-onset events	November 2017 (COP 23)			■
Scoping paper on slow-onset events (SOEs) as reported by partners in the SOEs database	February 2018	■		
Call for Abstracts for Current Opinion in Environmental Sustainability special issue on 'Slow Onset Events related to Climate Change	October 2019–present	■		
Technical expert group to improve the knowledge base on and develop recommendations for approaches to addressing SOEs	Launched at ExCom #12 (October 2020)	■	■	■
Activities not yet implemented by the ExCom				
Technical meeting, jointly coordinated by the technical expert group on comprehensive risk management and the SOEs expert panel/group, with a focus on approaches in relation to recovery and rehabilitation and permanent loss (Workstream (a) 3)	Planned for ExCom 8/9 (delayed)	■		
Development tools for integration of information on potential loss and damage associated with SOEs into national planning and policymaking processes (Workstream (a) 4)	Planned for ExCom 10/11 (delayed)	■		
Capacity building – Expected results: improved state of knowledge, capacity, and technologies to understand, address, and track impacts, and enable approaches for highlighting loss and damage associated with the adverse effects of climate change, such as slow-onset events (Workstream (e) 2)				■
	Total	**7**	**5**	**3**

Source: Author

How is the topic of slow-onset processes addressed beyond the UNFCCC?

Slow-onset processes manifest and affect human and natural systems severely and often irreversibly in various different ways. Different slow-onset processes are also interlinked and mutually reinforce each other. Governance frameworks therefore need to globally address slow-onset processes collectively and coherently. Table 4 gives an overview of the global governance frameworks that recognise and potentially address slow-onset processes, with a special focus on SLR.

Table 4: Slow-onset processes in different global governance domains

Area of Governance and Relevant Frameworks	Details
Disaster Risk Reduction	
Sendia Framework for Disaster Risk Reduction	Sendai Article 4 'slow-onset disasters particularly affect communities, households and small and medium-sized enterprises, constituting a high percentage of all losses.(…).'
UNDRR	A slow-onset disaster is defined as one that emerges gradually over time. Slow-onset disasters could be associated with, for example, drought, desertification, sea level rise, and epidemic disease.
International Law and Human Rights	
Malé Declaration on Global Warming and Sea Level Rise (1989)	14 AOSIS states signed the Malé Declaration and States declared the intent to work together to protect the low-lying coastal and Small Island States from dangers posed by climate change, global warming, and sea level rise.
Human Rights Council	A/HRC/37/CRP.4: 'The slow onset effects of climate change and human rights protection for cross-border migrants slow onset effects of climate change, processes like sea level rise, salinization, drought, and desertification.'
Human Mobility	
Sydney Declaration of Principles on the Protection of Persons Displaced in the Context of Sea Level Rise	Committee on International Law and Sea Level Rise adopted Resolution 6/2018 based on and derived from relevant international legal provisions, principles, and frameworks. Includes principles on, for example, Evacuation of Affected Persons, Planned Relocations of Affected Persons, Internal Displacement of Affected Persons, Cross-Border Displacement of Affected Persons.

Area of Governance and Relevant Frameworks	Details
Global Compact on Migration	Para. 18: 'Develop adaptation and resilience strategies to sudden-onset and slow-onset natural disasters, […] such as desertification, land degradation, drought and sea level rise' Para. 21: 'Cooperate to identify, develop and strengthen solutions for migrants compelled to leave their countries of origin due to […] desertification, land degradation, drought and sea level rise'
Nansen Initiative: Agenda for Protection of Cross Border Displaced Persons	Para 1: 'Of these, an annual average of 22.5 million people was displaced by weather- and climate-related hazards. Others have to move because of the effects of sea level rise, desertification or environmental degradation.' Para. 11: 'It considers the effects of both sudden-onset and slow-onset hazards including, in particular, those linked to the adverse impacts of climate change' . And: 'slow-onset disasters are likely to arise in many parts of the world, cross-border disaster-displacement is a global challenge'
Humanitarian Aid and Development	
Agenda 2030	Sustainable Development Goals 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) and 13 (Take urgent action to combat climate change and its impacts)
OCHA	■ 'Drought – combined with other effects on freshwater availability, such as melting glaciers and salinisation due to sea level rise – is expected to have severe consequences for agricultural production.' ■ '...significant secondary consequences on society as people are displaced or migrate as a result of increased disasters, sea level rise, and competition over scarce natural resources or environmental decline...'
Biodiversity	
CBD	■ Specific recognition of SLR at CBD COP9 ■ Joint Liaison Group of UNCCD, CBD, and UNFCCC
Desertification	
UNCCD	■ Sole legally binding international agreement and global authority on desertification, land degradation, and drought ■ Works closely with the WMO, UNISDR ■ Specifically addresses the arid, semi-arid and dry sub-humid areas, known as drylands ■ UNCCD 2018-2030 Strategic Framework

Area of Governance and Relevant Frameworks	Details
Cultural Heritage	
UNESCO	■ UNESCO's Intergovernmental Oceanographic Commission (IOC) promotes international cooperation and coordinates programmes in marine research, services, observation systems, hazard mitigation, and capacity development to understand and effectively manage the oceans' and coastal areas' resources. ■ UNESCO is assisting SIDS in implementing the 1994 Barbados Programme of Action, the 2005 Mauritius Strategy and the SAMOA Pathway has been a priority for the Organization
Human Settlement	
UN-Habitat	■ Addresses sea level rise's impacts on urban areas ■ Addresses land degradation, desertification, and increasing temperature, including non-economic losses, as one of the few agencies to do so
Agriculture	
FAO	■ Global Soil Partnership ■ Assessment and monitoring of status of salinisation, impacts, and losses on agriculture ■ Monitoring of sea level rise's potential impacts on population and agriculture
Labour	
ILO	■ 'Slow-onset impacts such as sea level rise and diversification create risks that need to be managed through proactive planning and research on potential destination areas that can provide decent work avenues' (ILO FAQs 2020) ■ MOU between ILO and UNCCD
General UN resolutions covering slow-onset processes	
General Assembly	■ RES/73/231: Disaster Risk Reduction 2019 ■ RES/73/234 ■ RES/73/233 ■ A/RES/44/172 ■ RES/73/232 ■ RES/44/206 on sea level rise's possible adverse effects on islands and coastal areas countries, particularly developing countries ■ RES/70/1

Source: Author

The above table shows a large number of international bodies and agreements in different governance domains at the international level currently recognise and address SLR. Two General Assembly Resolutions specifically addressed it. The 1989 Resolution 44/206 addressed sea level rise's possible adverse effects on islands and coastal areas countries, by stating that, particularly, developing countries are vulnerable to climate change's adverse effects and are already experiencing an increase in such impacts. These include sea level rise and coastal erosion, further threatening food security, water availability, and livelihoods, and efforts to eradicate poverty in all its forms and dimensions and achieve sustainable development. In the frame of the Resolution 70/1 on Agenda 2030, emphasis was placed on increases in global mean temperature, sea level rise, ocean acidification, and other climate change impacts as seriously affecting coastal areas and low-lying coastal States, including many least developed States and Small Island Developing States. These topics were also seen as highly relevant for the governance of labour, migration, cultural heritage, human settlement, human rights, biodiversity, humanitarian aid and development, disaster risk reduction, agriculture, and food security.

In theory, SLR is a concern for all major domains of global governance. Official recognition of slow-onset processes forms a solid basis for governing SLR. A stocktaking by the WIM ExCom showed that 45 organisations across all world regions work on SLR issues.[11] Activities include data collection, assessment, stakeholder engagement, communication, and outreach, while they also include design of approaches and development of national polices. Despite all this, a substantial lack of globally installed and functioning mechanisms, instruments, and measures for managing the potential severe loss and damage from gradually worsening SLR is still evident because of a large set of challenges towards adequately addressing loss and damage due to slow-onset processes.

11 https://www4.unfccc.int/sites/nwpstaging/Pages/soesearch.aspx

CHALLENGES AND GAPS

IN ADEQUATELY ADDRESSING LOSS AND DAMAGE DUE TO SLOW-ONSET PROCESSES

In theory, slow-onset hazards are easier to manage than unexpected sudden-onset ones. Their gradual and creeping character and their early warning signs provide a more extended period of forewarning and sufficient time to plan the response (Staupe-Delgado 2019). In reality, these early warning signs often do not translate into action. Hazards resulting from slow-onset processes are often under-prioritised or ignored until their effects become severe and have worsened, sometimes irreversibly, into critical emergencies that need addressing with tools created for rapid-onset events (Glantz 1994). Already today, sea level rise and other slow-onset processes cause substantial economic and non-economic loss and damage and create critical emergencies. In Senegal, our case study country, the effects of sea level mixed with other anthropogenic factors are threatening the World Heritage Site of Saint-Louis. Other communities are already submerged, despite adaptation measures. Thousands of people have already been displaced, and many more will follow in the future. Of Saint-Louis territory, 80 % will be at risk of flooding by 2080 and 150,000 people will have to relocate (Government of Senegal/World Bank 2013).

Most of West Africa's coastal cities, home to 105 million people, face a similar threat.

The analysis in sections "Status quo of addressing loss and damage from slow-onset processes at the national level" (page 18 et seq.) and "Status quo of addressing loss and damage from slow-onset processes at the international level" (page 27 et seq.) shows that countries such as Senegal address different slow-onset processes as part of their adaptation and risk reduction strategy, and thereby try to avert and minimise potential loss and damage. However, the analysis also shows that even where plans and strategies exist, their implementation often lags. Moreover, it reveals a number of gaps and challenges in adequately addressing losses and damages due to slow-onset processes at the national and international levels – these are summarised below. We conducted a comprehensive literature review to verify and supplement the identified gaps and challenges. As the phenomena under 'slow-onset processes' have widely differing nature, gaps and challenges also differ depending on the process. As this paper series focuses on sea level rise, the challenges and gaps primarily apply to this case but were generalised and also partially apply to other slow-onset processes.

Challenges

Simultaneousness of different hazards that compete for attention: Risks and disasters compete for media and political attention and resources. Slow-onset processes often 'fail to secure the kind of public and political engagement that highly destructive and sudden disasters often do' (Staupe-Delgado 2019). Most countries and their respective entities continually deal with a multitude of risks and disasters of different magnitudes, which leaves scarce attention for creeping processes and events that will happen over the medium to-long term (ibid.). Additionally, in many countries, different slow-onset processes occur in parallel. Moreover, not only climate-related risks and disasters compete for attention. Developing countries in particular are dealing with a multitude of different challenges, including sustainable development and poverty eradication.

Decision making under uncertainty: All decisions on addressing slow-onset processes and their impacts must be made amidst considerable uncertainty. For sea level rise, uncertainty exists regarding the rise amount, costs, and prioritisation of adaptation action or implications of no action (Thorarinsdottir et al. 2017). Substantial uncertainty arises, for example, from potential ice mass loss from Antarctica that could rapidly increase SLR in the second half of this century. For political decision makers, it is therefore challenging to balance, for example, current and future welfare and intergenerational equity and longer-term population distribution (i.e. where it is safe for people and their assets to be and what areas may need to be permanently evacuated) (UNFCCC 2012b). Moreover, the impacts on societies brought by some losses and damages due to slow-onset processes will require 'fundamental changes to the way society, economies and cultures are organized' (UNFCCC 2012b).

Lack of institutional frameworks, responsibility, and fragmented responses: The above challenges contribute to what researchers often describe as 'early warning, late response' behaviour. Due to the uncertainty regarding their impacts, the responsibility at the national level for managing slow-onset processes is often unclear or lacking. Disaster management agencies' mandates often do not include slow-onset processes (Staupe-Delgado 2019). Some countries even encounter legal challenges in responding to slow-onset hazards, as a declaration of an emergency is the precondition for releasing funds (Staupe-Delgado et al. 2018). This lack is compounded by two dilemmas for political decision-making: balancing current and future welfare, and intergenerational equity (UNFCCC 2012b), and successful risk reduction for slow-onsets is not directly visible. Politically, successful risk reduction therefore cannot be exploited and thus often leads to a 'not in my term' behaviour (Kunreuther et al. 2009). Response measures consequently are either lacking or fragmented; this will 'eventually lead to the fatigue of

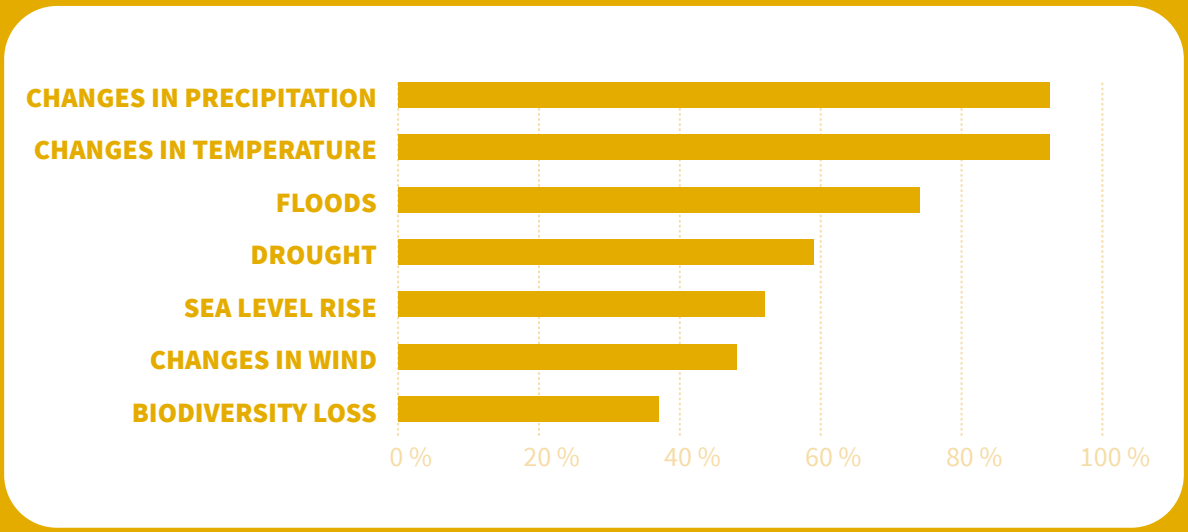
the media, politicians and aid agencies - often turning them into forgotten disasters' (Staupe-Delgado 2019). This is also due to a lack of institutional frameworks and commitment amongst key stakeholders on issues related to slow-onset events (UNFCCC Secretariat 2017).

Gaps

Lack of and/or insufficient data and knowledge: The interviews and literature review identified a key gap in addressing loss and damage due to slow-onset processes – the lack of, or insufficient, long-term monitoring of slow-onset processes, which hinders definitions of the: (a) impacts of slow-onset processes on the local level; (b) point in time when impacts become harmful for ecosystems, societies, or economies; and (c) amount of resources needed to address losses and damages from slow-onset processes.

Although considerable research exists on particular slow-onset hazards, such as sea level rise and desertification, there often is no adequate information for impacts at the national level. Countries mention access to quantitative and long-term data, relevant to identifying and prioritising climate risk analysis, and access to skilled personnel (especially with data collection and modelling skills) as key challenges (ExCom 2019). Countries also report a general 'difficulty [in] analysing risks of slow onset events vis-à-vis risks of extreme weather events' (UNFCCC Secretariat 2017). To date, slow-onset processes are not adequately monitored over the long term in most countries so as to determine the baseline risk associated with slow-onset hazards and track rates of change (UNFCCC 2012a). The graph in Figure 3 indicates the extent to which 28 developing countries have science-based national climate impact projections for certain aspects. Gaps exist with regard to all aspects, but slow-onset processes such as sea level rise and biodiversity loss show particularly large gaps.

Figure 3: National climate impact projections for extreme weather events and slow-onset processes



Source: UNFCCC Secretariat 2017

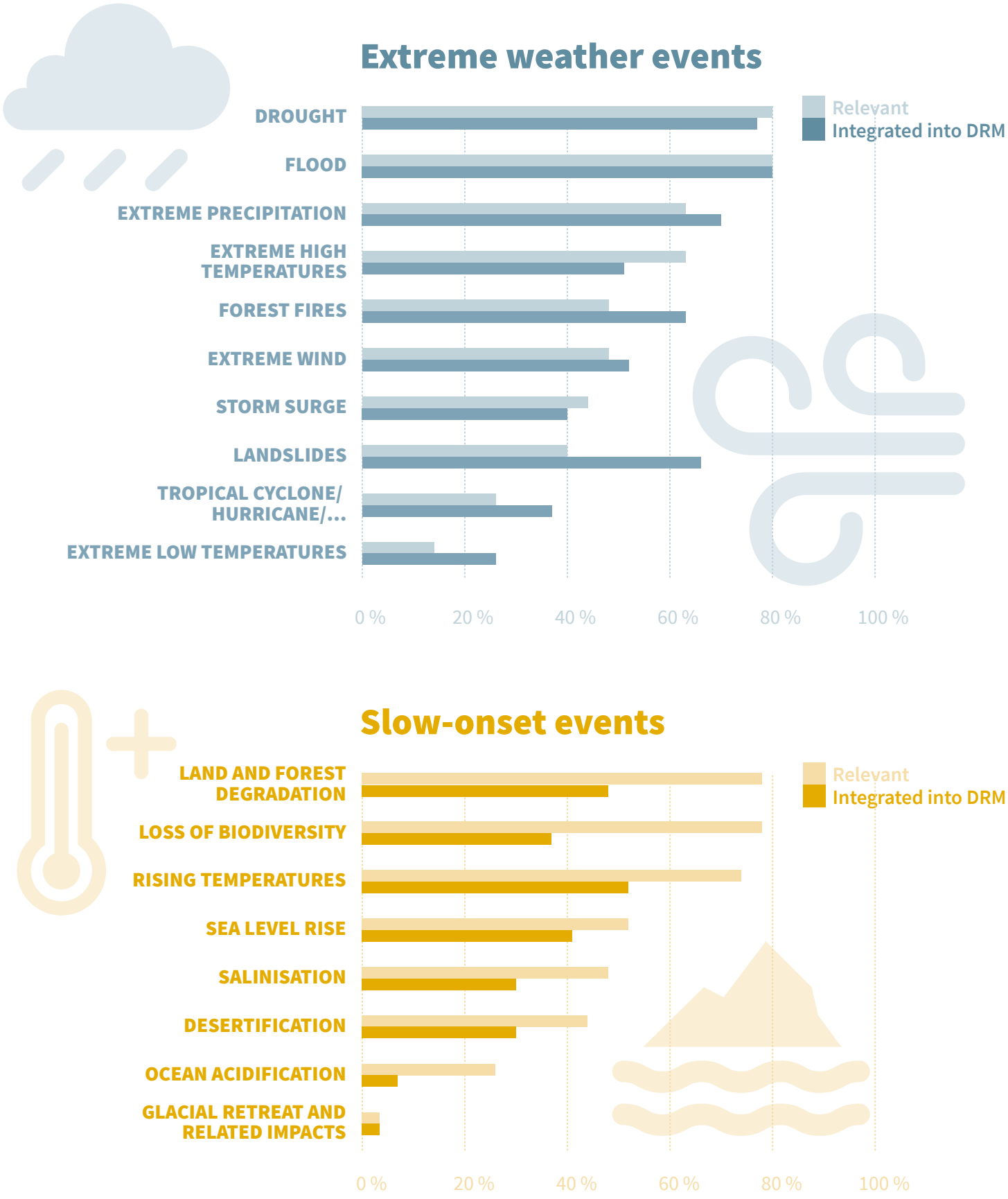
Countries clearly indicate a lack of baselines, capacities, and resources to monitor, analyse, and quantify slow-onset processes such as desertification and biodiversity loss and its impacts (UNFCCC Secretariat 2017). Particularly, the most vulnerable countries lack methods, equipment, data, and efficient data storage (e.g. flow meters or automated systems for collecting hydrological and meteorological data) to conduct such long-term monitoring. Moreover, it is generally challenging to define when a slow-onset hazard's impacts become harmful, as they are difficult to quantify with catastrophe-modelling techniques used for rapid-onset events. For example, 'the effects of steadily rising temperatures or saline levels on crop yield are modified by other factors, and laboratory conditions cannot mimic field conditions perfectly' (UNFCCC 2008).

Addressing slow-onset processes with climate risk management strategies. Existing approaches for climate and disaster risk management primarily focus on managing risks and impacts of extreme weather events. Existing CRM approaches, however, do not effectively cover risks and impacts from slow-onset processes (see, for example, Le Quesne et al. 2017). This problem can be observed in the context of the disaster risk management cycle, which is a key concept in the field of disaster management. It applies phase logic with a linear disaster sequence with a clearly definable beginning and end (Staupe-Delgado 2019). This logic helped to shift the focus of disaster risk management activities to mitigation and preparedness. The cycle, however, is difficult to apply towards slow-onset processes that gradually manifest, have ongoing effects, and where it is challenging to define a clear beginning and end. This gap can partially be explained by the concept of disasters often being equated with rapid onset events, and defined by factors of acuteness, urgency, or vast destruction (Staupe-Delgado 2019).

Initial steps in addressing the conceptual gap are taking place (see the example of the climate risk management cycle that considers rapid-onset events and slow-onset processes, by NIDM and GIZ [2019], described in section "Status quo of addressing loss and damage from slow-onset processes at the international level" on page 27 et seq.). These are a good start in addressing slow-onset processes with climate risk management. Their applicability to different slow-onset processes, however, still needs testing on the ground to find whether it can effectively support countries and communities. Particularly, the step of implementation of identified options needs to be further detailed, considering the challenge that managing impacts due to slow-onset processes has become a continuous activity for communities.

The conceptual lack in adequately addressing slow-onset processes in CRM strategies leads to these processes often not being integrated, or not being well integrated, into CRM strategies at the national level. The graphs in Figure 4 show the relevance of extreme weather events and slow-onset processes for 28 developing countries, and the degree to which each is integrated into countries' disaster risk management. Gaps also exist regarding extreme weather events (e.g. tropical cyclones are only integrated in roughly 40 % of countries' disaster risk management systems), but slow-onset processes are substantially less integrated into national disaster risk management systems.

Figure 4: Extreme weather events and slow-onset processes in countries' disaster risk management



Source: UNFCCC Secretariat 2017

Financial tools and instruments to address losses and damages due to slow-onset processes. A frequently mentioned gap in adequately addressing loss and damage due to slow-onset processes – reported both by interviewees and in the literature – is insufficient financing and the lack of adequate financial tools and instruments to address loss and damage from slow-onset processes (regarding both curative and transformative loss and damage measures). This gap was also highlighted during the 2016 Forum of the Standing Committee on Finance on financial instruments addressing the risks of loss and damage. The Forum concluded that, 'a major gap exists in addressing slow-onset events, because current approaches are more suited to extreme weather events and other rapid-onset events' (UNFCCC/CP/2016/8). A key challenge the Forum highlighted in this regard, and that is echoed in literature, is that 'existing financial instruments have limitations in addressing slow-onset events' (ibid.). Consequently, the Standing Committee on Finance, 'encourages Parties, research institutions and the private sector, inter alia, the insurance industry, to advance discussions and expedite work on suitable solutions and approaches that address slow-onset events' (ibid.) as part of its recommendations.

The same problem also appears in the ExCom's compilation of best practices, challenges, and lessons learned from existing financial instruments, for addressing loss and damage risk. While a variety of different financial tools to address rapid-onset events could be listed, 'information was also rather limited regarding those financial instruments and tools that could be effective for the context of slow onset events, and that of non-economic losses' (ExCom 2016). The ExCom concludes that, 'further analysis may be useful for a better understanding of what kind of "novel" instruments could fill such gap' (ExCom 2016). Thus far, however, the ExCom has scarcely implemented any activities to fill this gap. The analysis of the ExCom's slow-onset-related activities clearly showed the ExCom's focus regarding these processes lied, and lies, in enhancing knowledge and understanding, as well as strengthening dialogue, while enhancing action and support in this regard falls short (only three of 13 activities were implemented or planned in this area) (see section "Status quo of addressing loss and damage from slow-onset processes at the international level" on page 27 et seq.).

Dealing with chronic risks requires setting up financial protection measures to increase financial resilience to protect fiscal balances, subnational governments, households, and businesses. This includes, 'long-term build-up of funds to pay the inevitable claim and are in many ways a form of saving' (UNFCCC 2008). At the country level, there is often no financial management approach for the slow-onset processes countries are facing and, 'the annual budget cycle often cannot accommodate needs related to events that evolve over many years' (UNFCCC 2012a). Although national budgets or bilateral and international financial resources cover some effects, the funding is largely insufficient and, in the case of Senegal, only allows quite limited-scale activities. This leads to severe effects for households as, due to the current lack of financial protection strategies, households pay for a large part of the funding for the fight against the impacts of climate hazards, such as coastal erosion, salinisation of land and water resources, loss of biodiversity, desertification, and the drop in yields due to rising temperatures (ENDA based on interviews 7–10).

OUTLOOK

All the gaps and challenges described in section "Challenges and gaps in adequately addressing loss and damage due to slow-onset processes" (page 36 et seq.) should be addressed to adequately address loss and damage resulting from slow-onset processes. Particularly regarding financial tools and instruments, the analysis shows no significant progress has been made since 2012. At that point, the literature review noted this is an area where 'most lessons need to be learned, new approaches to be tested and experiences need to be shared' (UNFCCC 2012b). Progress on developing adequate approaches, and then testing them, has been lacking.

The next part of this series analyses existing and potential financial tools and instruments to effectively address loss and damage from slow-onset processes, with the aim of helping to develop and test adequate approaches.

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Interview 8: Boucar Diouf, Mayor of Joal-Fadiouth, Senegal. 4.8.2020.

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