

Calculating the Loss and Damage Finance Gap

A Scoping and Feasibility Exercise

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List of abbreviations

BTR	Biennial Transparency Report
BUR	Biennial Update Reports
COP	Conference of the Parties
CRS	Creditor Reporting System
DAC	Development Assistance Committee
DaLA	Damage and Loss Assessment
DEval	German Institute for Development Evaluation (Deutsches Evaluierungsinstitut der Entwicklungszusammenarbeit)
DRR	Disaster Risk Reduction
EM-DAT	Emergency Events Database
ETF	Enhanced Transparency Framework
FAR	fraction of attributable risk
GHG	greenhouse gas
IAM	Integrated Assessment Models
NAP	National Adaptation Plan
NC	National Communication
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Co-operation and Development
PDNA	post-disaster needs assessment
SCF	Standing Committee on Finance
TC	Transitional Committee
TC TSU	Technical Support Unit to the Transitional Committee
TNA	Technology Needs Assessment
UNCTAD	UN Trade and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WIM	Warsaw International Mechanism

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SUMMARY

With the establishment of the Fund for responding to Loss and Damage, loss and damage finance has been firmly institutionalised under the United Nations Framework Convention on Climate Change (UNFCCC). At the same time, little knowledge exists on the financing gap that the Fund would ideally close.

The situation is different for mitigation and adaptation. The United Nations Environment Programme publishes annual ‘gap reports’ on both, and the Adaptation Gap Report calculates the difference between financing needs by developing countries and financial support provided by developed countries (as categorised under the UNFCCC).

In light of this shortcoming, calls for a ‘loss and damage finance gap report’ have been voiced. Yet, several methodological challenges have stood in

the way of calculating the loss and damage finance gap. Next to challenges in quantifying lost or damaged values and related activity costs, the lack of a loss and damage finance marker is at the core of analytical concerns: without agreement on what exactly constitutes ‘responses’ to loss and damage, it is not clear which needs and financial flows for what activities to consider.

As this report argues, the situation has changed. In 2023, the Transitional Committee (TC) for the Fund for responding to Loss and Damage met regularly to develop a roadmap and broad outlines of how the fund would operate. This work resulted in what can be considered a working definition of loss and damage finance. The decision at the 27th Conference of the Parties (COP) established the Fund for responding to Loss and Damage and further defined its scope to finance

‘especially in the context of ongoing and ex post action’ (UNFCCC 2022a) related to climate-related extreme weather events and slow onset events. This report uses these technical developments as a starting point to suggest how a loss and damage finance gap could be calculated.

Defining climate-related loss and damage finance

In order to operationalise a loss and damage finance definition, we propose a loss and damage finance marker as follows: An activity should be classified as a loss and damage activity if it contributes to [preparedness], response, recovery, rehabilitation or reconstruction following a climate-related extreme event or due to a climate-related slow onset process.¹

Ideally, donors could use this loss and damage marker to tag the financial support they provide. In the absence of such practice, the proposed marker can be applied to tag and track finance flows to assess an aggregate loss and damage finance gap.

Depending on the scope of the working definition of loss and damage finance operationalised in a loss and damage finance gap report, careful consideration of potential connections with the Adaptation Gap Report would be needed. The risk of double counting is

apparent for both support needed and provided. However, it is equally clear that methodological rigour and transparency can reduce this risk.

In this context, the question arises as to what ‘climate-related’ means. We note that the required level of evidence is yet to be determined and should not place undue and unrealistic data burdens on those in need of financial support. This report outlines various approaches to using scientific evidence as a basis for labelling financing needs as ‘loss and damage’ in the context of a loss and damage finance gap report.

Identifying sources of information on loss and damage finance needs

Next, this report identifies available sources of information on loss and damage financing needs. These are understood to consist of two main categories, always considering both economic and non-economic dimensions: first, the costs of direct and indirect losses, and second, damages and the costs of activities to address loss and damage.

We review the scope of different national reports that countries can submit under the UNFCCC. Taking a closer look at Nationally Determined Contributions and National Adaptation Plans, we find that quantified needs are

¹ As this report notes, the category of ‘preparedness’ appears to sit outside the scope of ‘ongoing and ex post action’ as set by the COP27 decision. Yet, given its explicit reflection in TC-related work, and the need for acceptability of a marker across all stakeholders, its inclusion would thus require further consideration.

sporadic and illustrative, and that activities to address loss and damage are rarely costed. Thus, while these sources provide some indirect information on financial needs, no comprehensive aggregate number will yet emerge.

Outside the UNFCCC, post-disaster needs assessments and disaster loss databases can be another source of information on loss and damage finance needs, limited however to costs associated with climate-related extreme events. In order to capture the financing needs related to slow onset events and as experienced by local populations, any review of aggregate financing needs should include sub-national loss assessments and academic studies if available.

Identifying loss and damage financial support provided

Operationalising the proposed loss and damage finance marker would allow for extracting some information on support provided for specific activities to address loss and damage from the Creditor Reporting System (CRS), administered by the Development Assistance Committee of the Organisation for Economic Co-operation and Development. When an event motivating the release of these resources

is considered climate-related, the support provided could be considered as 'loss and damage support provided'.

Additionally, machine learning could be applied to identify loss and damage support provided but reported under sectoral activities. Pledges made to the Fund for responding to Loss and Damage are another source of information on loss and damage support provided.

Calculating the (preliminary) loss and damage finance gap

Information aggregated from the sources in this report, and potentially extrapolated to cover geographical gaps, presents a basis to compare needs with support provided. Any such estimate is bound to be incomplete and preliminary, given prevalent data gaps in developing countries, scarce information related particularly to slow onset events, and the dynamic nature of loss and damage under steadily rising temperatures.

Yet, sufficient data exists to arrive at a first approximation of the loss and damage finance gap and delineate the analytical framework for more comprehensive assessments in the future.

1 INTRODUCTION

With the establishment of the Fund for responding to Loss and Damage at the 27th Conference of the Parties (COP) and its formal operationalisation at COP28, the issue of loss and damage finance has firmly arrived on the multilateral climate change agenda of the United Nations Framework Convention on Climate Change (UNFCCC). The Parties have precipitated into action what took decades of fractious debate and negotiations: that adaptation is insufficient to eliminate or reduce all risks from climate change, and that vulnerable countries require support to address the residual impacts of climate change.

At the same time, little knowledge or information exists on the aggregate financial needs of developing countries related to loss and damage, how they evolve over time and temperature rise, or on the financing gap that the Fund for responding to Loss and Damage would ideally close. The situation is different for mitigation and adaptation. The United Nations Environment Programme (UNEP) has published annual ‘gap reports’ on both, and the Adaptation Gap Report calculates the difference between financing needs of developing countries and financial support provided by developed

countries (as categorised under the UNFCCC). In light of this shortcoming, calls for a ‘loss and damage finance gap report’ have been voiced.

The objective of this report is to assess the feasibility of such a loss and damage finance gap assessment. To this purpose, we propose categories for tagging finance that is provided specifically to address loss and damage, and identify available sources of information as well as persistent data gaps and reporting gaps.

Compared to the two other ‘pillars’ of climate action, mitigation and adaptation, the evidence base and information landscape around loss and damage financing remains lacking. While developing countries had tried to introduce a floor of USD 100 billion by 2030 in the terms of reference for the Fund for responding to Loss and Damage (UNFCCC 2023), no quantitative ballpark was eventually agreed.

For mitigation and adaptation, there is a vast body of academic literature and accounting mechanisms for related financial flows. The Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD) has developed ‘Rio Markers’ to tag official development assistance as ‘adaptation-related’ or ‘climate-change-mitigation’ (OECD 2016). Accordingly, finance flows reflecting support provided by industrialised to developing countries can directly be traced. At the same time, developing countries have been articulating and quantifying their adaptation needs in line with guidance and initial funding by the UNFCCC institutional architecture. In addition, sectoral climate impact models are partly able to calculate the costs of adaptation needed to reduce climate risks in individual sectors and countries. The existence of institutional markers and data thus allows for an assessment of the gap between resources needed and provided, as calculated annually in the Mitigation and Adaptation Gap Reports, published by UNEP.

For loss and damage, prior to the establishment of the Fund for responding to Loss and Damage, financial frameworks, both conventional and those under

the UNFCCC, did not explicitly classify specific types of finance as ‘loss and damage’. Neither multilateral funds nor bilateral financial support were labelled or recognised as earmarked for addressing loss and damage. The many complexities of assessing climate finance are well summarised by the UNFCCC Secretariat. It states that ‘[t]he lack of demarcation of loss and damage, absence of common understanding and of classification or tagging of associated finance pose significant challenges in the collection, aggregation of financial information or elaboration of sources of finance for addressing loss and damage’ (UNFCCC 2019: 8). Further complexity in the loss and damage finance landscape comes from types of non-climate finance, such as humanitarian assistance, Official Development Assistance, and support for disaster risk management that have been considered as loss and damage finance (Stamp out Poverty et al. 2021; UNFCCC Transitional Committee 2023).

The institutional framework for reporting financing needs under the UNFCCC has only started to emerge. Under the Paris Agreement’s Enhanced Transparency Framework (ETF), interested Parties can report on loss and damage, related activities, and consequent needs in the context of Biennial Transparency Reports (BTRs) (UNFCCC 2018). Additionally, the Consultative Group of Experts, mandated with reporting guidance, has included loss and damage reporting guidance (Consultative Group of Experts 2023). Individual countries have individually started referring to loss and damage in their Nationally Determined Contributions (NDCs) (Elisa Calliari and Ryder 2023), National Adaptation Plans (NAPs), or National Communications (NCs).

At the same time, working definitions of loss and damage finance have de facto emerged from the technical work conducted on the issue since the establishment of the Warsaw International Mechanism for Loss and Damage (WIM) and its Executive Committee. Here, several information and technical papers have implicitly scoped the remit of loss and damage finance. A working definition of loss and damage activities and related finance flows also emerged throughout 2023

as the Transitional Committee (TC), set up to operationalise the Fund for responding to Loss and Damage, was deliberating on the issue.

Detached from the UNFCCC process, and using different markers, individual initiatives have tracked the provision of financial loss and damage support globally (SEEK 2024), nationally for the case of Germany (Leppert et al. 2021), or project-based in the case of DanChurchAid (Garcia et al. 2024).

Taken together, these recent developments provide an opportunity to identify and tag loss and damage financing needs and flows. As this scoping report argues, sufficient data exists to allow for a first assessment of the global loss and damage financing gap.

In **section 2** we give a brief overview of the existing Mitigation and Adaptation Gap Reports to distil lessons learnt that can be transferred to the case of loss

and damage. Next, in **section 3**, we review how loss and damage finance has been categorised in recent knowledge products developed under the UNFCCC. We combine the emergent working definition of the TC in 2023 with categories from Schäfer et al. (2021) to more comprehensively cover non-economic losses and activities that address slow onset events, as a basis for proposing a loss and damage finance marker. This marker could guide analyses informing a loss and damage finance gap report. In **section 4**, we review the sources of information on developing country financing needs inside and outside the UNFCCC. **Section 5** gives an overview of the options for extracting information on loss and damage finance support provided. **Section 6** synthesises previous findings to present methodological options for calculating the loss and damage finance gap. **Section 7** turns to other key aspects that need to be considered when realising a loss and damage finance gap report and goes through the steps that would need to be taken accordingly. **Section 8** concludes with an outlook.

2 INSIGHTS

FROM MITIGATION AND ADAPTION GAP REPORTS

At COP15 in Copenhagen in 2009, developed countries committed to a collective goal of mobilising USD 100 billion per year by 2020 for climate action in developing countries, for both mitigation and adaptation. Although climate finance has been increasing in the last decade, the 50/50 split between adaptation and mitigation has not been realised. Several reports cover the finance gaps for mitigation and adaptation, both with regards to the USD 100 billion goal and actual estimated needs. In this section, we look at how often they are published, by whom, what they cover, what methodologies are being used and what costs and gaps are being presented.

2.1 Measuring international climate finance flows

The OECD has been tracking progress towards the USD 100 billion goal since 2015. It is responsible for producing regular analyses of progress made, based on an accounting framework that is consistent with the COP24 outcome agreed by all Parties to the Paris Agreement on funding sources and financial

instruments. It includes four distinct components of climate finance: 1) bilateral public climate finance, 2) multilateral public climate finance, 3) climate-related officially supported export credits, and 4) private finance. The OECD looks at three categories of climate finance, namely, mitigation, adaptation and cross-cutting finance and identifies key target sectors.

Methodologically, tracking climate finance flows is made possible by donors tagging Official Development Assistance with ‘Rio Markers’ in the Creditor Reporting System (CRS), administered by the OECD Development Assistance Committee (DAC). A methodological handbook has been developed to guide tagging (OECD 2016).^[2] According to this handbook, an activity (and respective finance provided) should be tagged as ‘mitigation’ if:

It contributes to the objective of stabilisation of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system by promoting efforts to reduce or limit GHG emissions or to enhance GHG sequestration. (OECD 2016: 3)

It should be tagged as ‘adaptation’ if:

It intends to reduce the vulnerability of human or natural systems to the current and expected impacts of climate change, including climate variability, by maintaining or increasing resilience, through increased ability to adapt to, or absorb, climate change stresses, shocks and variability and/or by helping reduce exposure to them. (OECD 2016: 4)

Both these tags allow for extracting information on financial support provided for mitigation and adaptation action.

2.2 Assessing the mitigation finance gap

The Emissions Gap Report is an annual science-based assessment published by UNEP since 2010. It assesses that gap between estimated future global GHG emissions if countries implement their mitigation targets on the one hand, and where they should be to avoid the worst impacts of climate change on the other. The Report is released every year ahead of COP to inform the negotiations. The Emission Gap Report is co-produced by UNEP and partners.

The 2023 Emissions Gap Report does not assess the mitigation finance gap by putting a single global number on it but rather presents values available for specific world regions, sectors, or technologies (UNEP 2023b). The quantitative data is mainly drawn from the International Energy Agency, the International Renewable Energy Agency, and the United Nations Economic Commission for Africa reports. The 2022 Emissions Gap Report (UNEP 2022) contains a figure in the executive summary (ES.6) which presents finance flows and mitigation investment needs per sector, region and type of economy. The data is based on the latest Intergovernmental Panel on Climate Change (IPCC) Working Group III report published in 2022.

2.3 Assessing the adaptation finance gap

The Adaptation Gap Report has also been published by UNEP on a yearly basis since 2014, providing a science-based assessment of the global progress on adaptation planning, financing, and implementation. It aims to inform the climate negotiations as an independent assessment and therefore closely aligns with the requirements of the UNFCCC Global Stocktake. The Adaptation Gap Report is co-produced by UNEP, the UNEP Copenhagen Climate Centre, and the World Adaptation Science Programme.

² Note that the handbook is no longer available on the referenced website but can be provided by the authors of this report upon request.

The 2023 Adaptation Gap Report dedicates an entire chapter to the adaptation finance gap (UNEP 2023a: 61–74). It estimates both adaptation costs of developing countries and adaptation finance flows from developed countries to evaluate the public adaptation finance gap of developing countries. Yearly adaptation costs and needs are estimated for this decade, from 2021 to 2030. Its scope is limited to the currently observed adaptation finance gap, although it is mentioned that adaptation finance costs are projected to rise by 2050 due to increasing climate change.

Adaptations finance needs are calculated through a modelling analysis and by assessing the needs communicated by countries in NAPs and NDCs. The modelling analysis is based on an aggregation of existing sectoral assessments and additional sectors

and risks, covering costs of coastal protection, river floods, and disease control among others (see more examples in **Table 1** below). The report states that modelled costs remain partial as they, for example, do not take into account costs related to labour productivity or values for biodiversity. They also do not include residual costs which are relevant for loss and damage, as adaptation costs do not cover all costs linked to the impacts of climate change. Finally, the modelling analysis produces a significant range of results for the cost of adaptation based on the different models and assumptions used. Overall, the cost of adaptation is estimated to range between USD 215–387 billion per year. The lower bound of the range corresponds to the estimate of the modelling analysis. The upper bound value of the range is the result of the needs communicated in NAPs and NDCs, which have

Table 1: Three examples from modelled sectoral costs of adaptation for developing countries. Source and references: extracted from UNEP (2023a: 34).

Sector	Approach	Estimated adaptation costs for developing countries
Coastal zones	DIVA model (Hinkel et al. 2013; Hinkel et al. 2014) and model runs (Lincke et al. 2018)	Cost of coastal protection and beach nourishment estimated at USD 56 billion/year for 2020–2030 (adaptation cost only, excluding residual damage, RCP4.5–SSP2). Costs increase by 2050s, especially for higher emission scenarios, and increase rapidly thereafter. High residual costs remain after adaptation, though levels vary with protection levels.
Agriculture	IFPRI modelling suite and model runs (Sulser et al. 2021)	Annual adaptation investment needs to address the impact of climate change on chronic hunger estimated at USD 16 billion/year over the period 2015–2050, based on costs of agricultural research and development, water management, and infrastructure.
Infrastructure	World Bank Studies (Hallegatte, Rentschler and Rozenberg 2019; Hallegatte et al. 2019), extended to 2050	Costs of making infrastructure resilient in the energy and transport sub-sectors estimated at USD 56 billion/year. Adaptation reduces the risks of damage by a factor of two to three, though residual impacts remain. Costs increase significantly towards 2050. Does not include adaptation costs for other infrastructure (including urban).

been extrapolated to cover data gaps when no needs have been communicated by developing countries.

Adaptation finance provided is calculated based on the current financial flows from developed to developing countries, using the latest data provided by the OECD. The Adaptation Gap Report only looks at international public finance consisting of bilateral flows and multilateral outflows.

The adaptation finance gap is evaluated by calculating the difference between estimated adaptation costs/needs and the amount of finance flows towards adaptation activities (support provided).

The Adaptation Gap Report 2023 includes for the first time a chapter on loss and damage (Chapter 5).

It explains what loss and damage is and how it has emerged as a third key pillar of climate policy in addition to adaptation and mitigation. It outlines how loss and damage has evolved in the climate negotiations and then delves into the following key topics:

- Soft and hard limits to adaptation in natural and social systems, and their relevance for our thinking about ways to avoid and minimise loss and damage.
- Different conceptualisations and perspectives on loss and damage, including a climate justice lens.
- Different policy options for addressing economic and non-economic losses and damages.
- The magnitude, sources, and mechanisms for financing action to address loss and damage.

KEY MESSAGES FROM THIS SECTION:

- International climate finance flows are tagged as either ‘mitigation’ or ‘adaptation’ in the Creditor Reporting System (CRS) under the OECD.
- The Mitigation Gap Report does not calculate the mitigation finance gap as a single global number but rather relies on published estimates for specific world regions, sectors, or technologies.
- The Adaptation Gap Report utilises both modelled adaptation finance needs and those communicated by developing countries to assess needs and compares those with the finance provided by developed countries as available in the OECD database.

3 TAGGING

LOSS AND DAMAGE FINANCE

The scope of what constitutes loss and damage, and related activities, has been historically contested (Boyd et al. 2017; Vanhala and Hestbaek 2016). Some, including developing countries, stress that loss and damage is ‘beyond adaptation’ (Serdeczny 2023) and thus refers to ‘adverse impacts of human-induced climate change on human societies and the natural environment that cannot or have not been avoided by mitigation or adaptation, or that will not be avoided in the future’ (Schäfer et al. 2021: 6, footnote 1, based on Mace/Verheyen 2016: 198). Others, including developed country negotiators under the UNFCCC, consider loss and damage responses to be part of an adaptation continuum, thus questioning the legitimacy of the issue as a separate policy field altogether (Calliari, Serdeczny, and Vanhala 2020).

This contested definition and unclear distinction of loss and damage activities from adaptation have been a core challenge in developing a possible ‘loss and damage marker’. In particular the language agreed in the Paris Agreement, in which Parties recognise the importance of ‘averting, minimizing and addressing’ loss and damage (UNFCCC 2015), blurs the lines between ex ante risk reduction by way of adaptation and responding to loss and damage. However, more

recent developments arguably pave the way for a workable loss and damage finance marker, without having to rely on an officially agreed definition of loss and damage.

3.1 Review of existing loss and damage finance categorisations

Various initiatives have implicitly or explicitly tagged specific finance flows as loss and damage in their respective assessments of financial support provided to developing countries.

For example, the ‘Donor Tracker’ by SEEK Development^[3] traces pledges that are branded as loss and damage support by donors themselves.

The German Institute for Development Evaluation (DEval) has evaluated instruments for managing residual risks that remain after climate risks have been reduced through mitigation and adaptation (Leppert et al. 2021). These are risk financing (including instruments such as climate risk insurances, reinsurance, equity, bonds, derivatives), preparedness (e.g. through contingency planning), and transformative risk management. This reflects how loss and damage support

3 Website of the Donor Tracker: www.donortracker.org (accessed 26 August 2024).

Table 2: Loss and damage responses identified in Schäfer et al. (2021: 8).

Analysed measures to address loss and damage
<p>A. Financial protection</p> <ul style="list-style-type: none"> ■ Setting up, scaling up, or capacity building for climate risk insurance schemes ■ Integrating climate change risks and impacts into and/or scaling up social protection schemes ■ Setting up, scaling up or capacity building for contingency funds
<p>B. Recovery and rehabilitation (e.g. applicable for areas that are not permanently submerged but affected by more frequent high sea level events), including for example:</p> <ul style="list-style-type: none"> ■ Rebuilding of infrastructure ■ Restoration of ecosystems and landscapes ■ Rebuilding/Restoring of livelihoods
<p>C. Migration and alternative livelihoods</p> <ul style="list-style-type: none"> ■ Support measures for (planned) relocation or resettlement ■ Building up alternative livelihood provisions ■ Support measures for climate-induced displaced persons and people affected by forced migration
<p>D. Addressing non-economic loss and damage</p> <ul style="list-style-type: none"> ■ Active remembrance ■ Societal identity and cultural heritage protection ■ Counselling

can be categorised by financial instruments, akin to categories deployed by the WIM (UNFCCC 2016a) or the Standing Committee of Finance (UNFCCC 2016b). The UNFCCC 2019 Technical Paper used the different layers of risk management as a categorisation template (UNFCCC 2019a).

The Danish humanitarian, faith-based NGO DanChurchAid has developed a loss and damage marker to monitor its own project portfolio. This loss and damage marker ‘ includes humanitarian response and recovery following a climate related disaster, rebuilding, relocation as well as actions to address irreversible losses and support social cohesion and healing’ (Garcia et al. 2024: 3). In order to avoid overlap with the adaptation marker employed by DanChurchAid, the adaptation marker was adjusted

to focus on activities that avert and minimise future loss and damage, i.e. are more prospective in nature.

A report by Germanwatch (Schäfer et al. 2021) mapped the funding provided through the Adaptation Fund, Green Climate Fund, Least Developed Countries Fund, and Special Climate Change Fund against a catalogue of loss and damage measures reflected in **Table 2**. By implication, funding for these measures was considered loss and damage funding.

More recently, the COP27 decision establishing the Fund for responding to Loss and Damage has provided the ground to narrow the scope of loss and damage activities by recognising the need for ‘new, additional, predictable and adequate financial resources [...] especially in the context of ongoing and ex post

Table 3: Loss and damage needs spectrum and related actions. Source: UNFCCC Transitional Committee (2023).

Need Spectrum	Actions
Preparedness	<ul style="list-style-type: none"> ■ Disaster risk reduction ■ Disaster preparedness planning ■ Early warning systems ■ Personnel training
Response	<ul style="list-style-type: none"> ■ Search and rescue ■ Emergency relief (food, emergency shelter, medical care) ■ Access control and damage assessment
Recovery	<ul style="list-style-type: none"> ■ Temporary shelter ■ Debris removal and clean-up ■ Restoration of vital infrastructure services ■ Social protection/livelihoods
Rehabilitation	<ul style="list-style-type: none"> ■ Management of injury/trauma ■ Prevention/management of disability ■ Restoration of functional capabilities ■ Re-integration of survivors
Reconstruction (Build Back Better, Forward/Resilient)	<ul style="list-style-type: none"> ■ Health care/mental health support ■ Resettlement ■ Physical and social infrastructure ■ Employment opportunities

(including rehabilitation, recovery and reconstruction) action' (UNFCCC 2022a, Decision 2/CP.27 §1). This has served as a basis for a categorisation of loss and damage finance by activities as conducted by the Technical Support Unit to the Transitional Committee (TC TSU) in its Synthesis Report (UNFCCC Transitional Committee 2023) (**Table 3**).

The needs spectrum developed by the TC TSU is mostly reflective of activities related to extreme events. It thus needs to be complemented by activities identified in Schäfer et al. (2021) to more explicitly reflect non-economic losses and slow onset events. Taken together, a set of activities can serve as a basis for tagging finance as 'loss and damage' if activities are taken in the context of or response to climate change. Notably, the category of reconstruction is understood to include transformative measures in response to slow onset events, such that the scope is not reduced to climate-related extreme events.

3.2 What is 'climate-related' and how to consider it in loss and damage finance reporting?

Loss and damage is multi-causal when internationally climate-charged hazards interact with national and local exposure and vulnerability. As a result, the question emerges whether attributing a certain event, or its societal consequences, to GHG emissions is a requirement for labelling a specific need or support provided as 'loss and damage'. Given persistent data scarcity in developing countries, different approaches to attributing an event to anthropogenic climate change pose different challenges.

Broadly speaking, four approaches exist to operationalise the science of attribution for determining whether an event, and related finance, falls within the scope of loss and damage.

(1) The inclusive approach

The most inclusive approach would consider all 'weather-related' events as 'climate-related'. This

would require no data. According to this approach, only geological natural hazards such as earthquakes, volcano eruptions, or tsunamis would not be covered.

(2) The qualitative approach

The second approach would use insights from the IPCC to qualitatively delineate which events can be regarded as influenced by anthropogenic climate change. Such an approach would not rely on data availability in developing countries, as it relies on theoretical knowledge and global modelling to inform scientific statements. The most comprehensive summary of such knowledge is available in the Technical Summary of the First Working Group in the IPCC's Sixth Assessment Report, Table TS.5 (IPCC Working Group I 2021; for an extract of information for developing countries see Annex of this report).

(3) The FAR approach

The third approach would follow a 'fraction of attributable risk' (FAR) approach and only count a percentage of losses as climate-related, in line with the changes in probability or intensity that resulted from anthropogenic climate change. This means that the fraction of risk from an event occurring due to anthropogenic climate change is also applied to the impacts of this event, using the following formula for an event i as applied by Panwar et al. (2023), based on Newman and Noy (2023):

$$\text{CC_loss \& damage}_i = \text{FAR}_i * \text{socio_economic cost}_i$$

The FAR approach has also recently been used to calculate the attributable loss and damage in Small Island Developing States by Panwar et al. (2023). Global averages are used due to the scarcity of studies calculating the FAR of events that occurred in developing country regions.

(4) The case-by-case quantitative approach

The fourth approach would be to rely on dedicated extreme event attribution studies for each case in which loss and damage financing needs are calculated. This approach relies heavily on data and analytical capacities.

Each of these approaches is associated with different data requirements, and not all are thus realistically feasible in a developing country context, marked by data gaps. A consistent calculation of loss and damage finance should thus be based on an agreed level of evidence that classifies finance to address loss and damage as ‘climate-related’ while keeping persistent data limitations in mind.

3.3 Suggesting a loss and damage finance marker

The knowledge products on loss and damage finance, and possible attribution approaches, provide the basis for proposing a loss and damage finance marker. Primarily such a finance marker would rely on the activity categories as specified in the TC TSU ‘needs spectrum’ in combination with activities to address slow onset events and non-economic losses as identified by Schäfer et al. (2021) (Tables 2 and 3 above).

Ideally, financial contributors would use this loss and damage marker to tag their financial support provided, akin to the use of Rio Markers under the OECD DAC. In the absence of an agreed and operationalised marker, the above definition and criteria can still be used to tag and track finance flows to assess an aggregate loss and damage finance gap.

As the category of preparedness appears to sit outside the scope of ‘ongoing and ex post action’ as set by the COP27 decision, its inclusion would require further consideration by authors of a loss and damage finance gap report. For this reason, preparedness is bracketed in Box 1, which spells out the proposed loss and damage finance marker.

The options listed in Box 1 under ‘criteria for eligibility’, c) reflect the different approaches to labelling an event and related activities as ‘climate-related’. We note that no standard evidence base has been set yet, and selection should be sensitive to data limitations in developing countries.

The proposed loss and damage marker could usefully apply the distinction between ‘principal’ and ‘significant’ objective, when, respectively, activities would not have been implemented without the objective of addressing loss and damage or have addressing loss and damage as a co-benefit.

Where activities have overlap with adaptation (as might be the case for resilient reconstruction) they could be reported as cross-cutting with adaptation (e.g. marking loss and damage as significant in the case of resilient reconstruction in an adaptation project). Similarly, were only a fraction of costs considered as loss and damage, it could be reported as cross cutting with disaster risk reduction, which is reported under a separate Disaster Risk Reduction (DRR) marker.

KEY MESSAGES FROM THIS SECTION:

- A working definition of loss and damage finance, centred around activities, has de facto emerged from technical work under the UNFCCC.
- The working definition provides the basis for tagging and tracking loss and damage finance.
- Various scientific approaches can be operationalised to determine if activities and related finance can be considered ‘climate-related’, and the selection of a standard evidence base should not place unrealistic data burdens on those in need.

Box 1: A possible loss and damage finance maker. Elements in brackets require further by authors of a loss and damage finance gap report.

CLIMATE CHANGE LOSS AND DAMAGE ACTIVITIES

Definition

An activity should be classified as a loss and damage activity if:

It contributes to [preparedness], response, recovery, rehabilitation, or reconstruction to/from economic and non-economic climate impacts following a climate-related extreme event or due to a climate-related slow onset process.

This encompasses a range of activities from the implementation of early warning systems, emergency relief, cultural heritage protection, counselling, restoration of vital infrastructure services, restoration of functional capabilities, resettlement, alternative employment/livelihood opportunities, social protection schemes, and the resilient rebuilding of physical and social infrastructure.

Criteria for eligibility

An activity is eligible for the climate change loss and damage marker if:

The climate change Loss and damage Response objective is:

- a) explicitly indicated in the activity documentation, and
- b) the activity contains specific measures targeting the definition above and
- c) [evidence base for proving link to anthropogenic climate change to be determined; possible options:

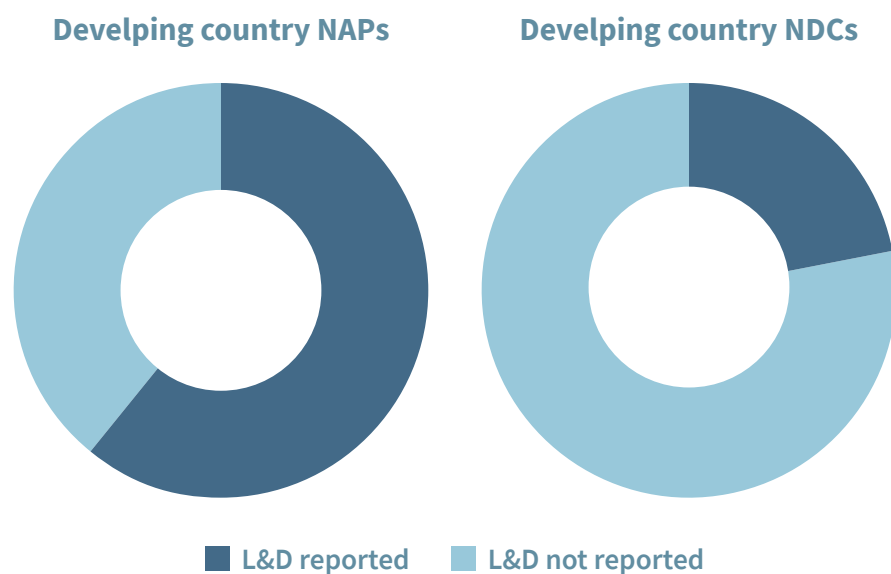
- the climatic event or process necessitating the activity is within the range of all possible climatic effects
- the climatic event or process necessitating the activity is within the range of climatic effects expected for a given region as detailed in the Annex.
- the climatic event was evidentially influenced by anthropogenic climate change in a quantifiable manner.
- the relative contribution of anthropogenic climate change to the event necessitating the activity can be quantified to allow the percentage of a contribution to be recognised as climate-related, with the remainder of resources to be reported under the DRR policy marker.]

4 SOURCES OF INFORMATION ON NEEDS

Financing needs that result from climate-related loss and damage can be expressed in different cost categories. Often, the unavoided or residual costs of climate change are used as a proxy for loss and damage (e.g. Markandya and González-Eguino 2019). This means that the value of lost or at-risk assets is used to express the cost of loss and damage, equating losses with financing needs. Some methods include overall, i.e. also indirect, economic effects, comparing observed economic growth with a hypothetical ‘no climate change’ scenario (Baarsch, Awal, and Schaeffer 2022). As we show below, the estimated values lost is also the metric most often used by developing countries in various reporting avenues under the UNFCCC.

Another, emergent, cost category refers to the costs of activities that need to be taken in response to loss and damage. In particular, the NDCs of Vanuatu and Haiti have spearheaded this approach by listing a set of activities the country is already taking in relation to loss and damage and estimating the costs for each of these. The emergent category of loss and damage activity financing needs is analogous to adaptation financing needs, which express the resources needed to implement adaptation.

Figure 1: Proportion of NAPs and NDCs that include loss and damage considerations.



Taken together, loss and damage financing needs consist of two categories: the USD values of assets lost or at risk and the costs of activities that countries take to address loss and damage. In the following we distinguish between ‘assets’ and ‘activities’ to analyse how loss and damage is most frequently reported and to identify reporting gaps beyond geographical scope.

4.1 National reporting

As mentioned above, for decades, there have been no specific reporting mechanisms within the UNFCCC for countries to report on loss and damage costs and needs. Accordingly, the majority of developing countries have not included related information in any national reporting (see **Figure 1** for the case of NAPs and NDCs). In numbers, 34 of 155 active developing country NDCs and 32 out of 54 NAPs mention loss and damage.

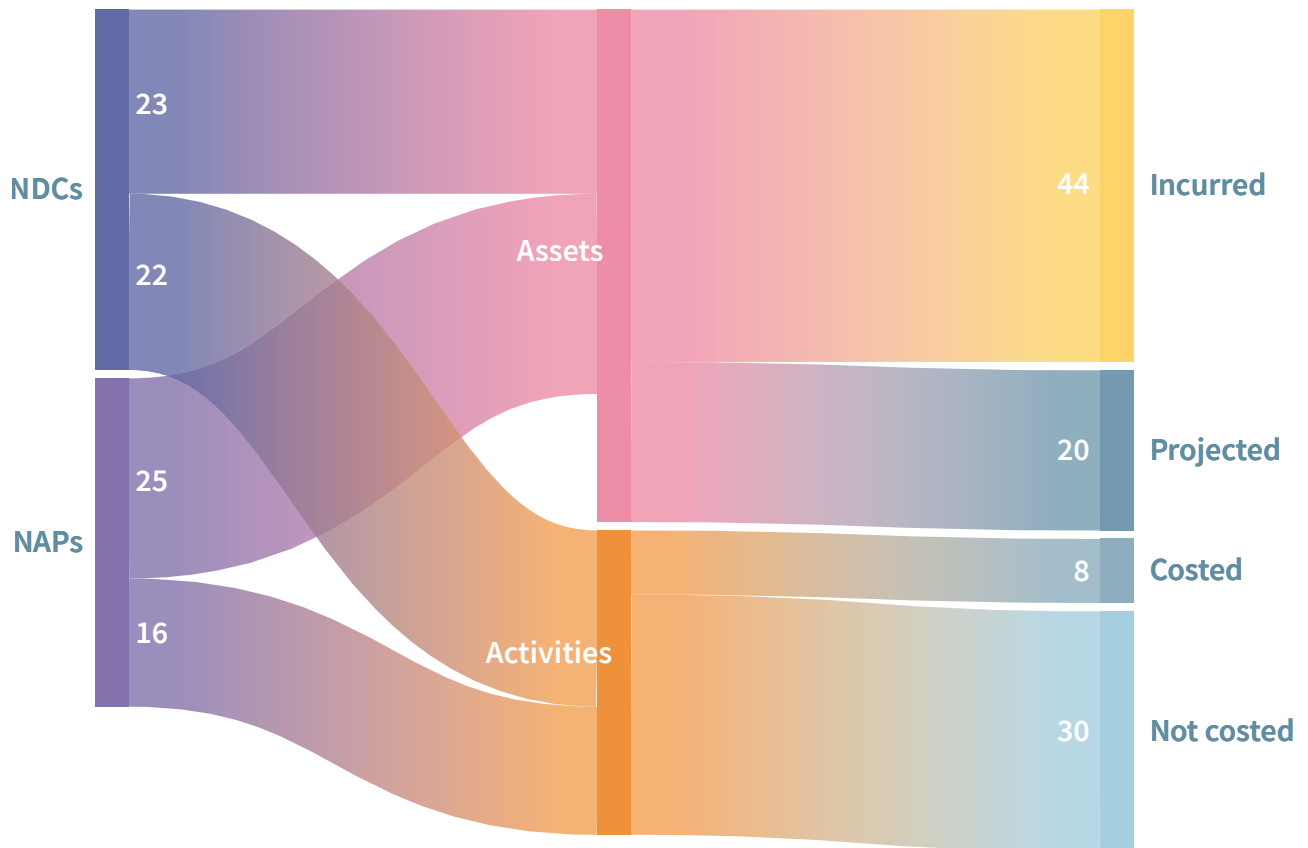
A closer look at those documents (napcentral n.d. and UNFCCC n.d.) reveals the diverse coverage of the types of loss and damage costs that countries report

(**Figure 2**). The majority of loss and damage references are costs that were incurred following a specific climate-related event in the past. Often, they are reported as contextual evidence to showcase a country’s vulnerability and exposure to climatic risks (see also Calliari and Ryder 2023). These costs are reported as losses of assets in USD and do not include related activity costs (reconstruction etc.).

From the activities that countries plan on taking in response to loss and damage, most are single activities such as conducting a risk assessment (Nauru), constructing cyclone shelters (Myanmar), or enhancing engagement with the WIM (Paraguay). Only eight documents provide cost estimates for implementing these activities (‘activities costed’ in **Figure 2**), and only two provide a comprehensive set and costing of activities (Vanuatu and Haiti).

In the case of Vanuatu, the underlying methodology for these estimates is an expert elicitation conducted among sectoral stakeholders who are already confronted with the need to address loss and damage (source: interview^[4]). As such, these qualitatively

⁴ Interview with member of the Vanuatu UNFCCC delegation, conducted virtually on 26 April 2024.

Figure 2: Types of loss and damage costs reported in developing country NDCs and NAPs.

scoped needs estimates reflect the reality experienced by national sectoral stakeholders at present. In many cases such ongoing activities reflect a category akin to ‘readiness’ in that stakeholders are trying to position themselves to access the funds eventually needed for ex post action such as recovery, rehabilitation, or other nationally determined responses.

Individual reported activities refer to specific activities ranging from conducting a climate risk assessment (Nauru) to ‘strengthen engagement with the WIM’ (Paraguay) to constructing cyclone shelters (Myanmar). This means that the entirety of possible loss and damage activities has hardly been considered or costed by most developing countries. This points to a severe underestimate of loss and damage financing needs for activities.

Despite these considerable gaps, there is a body of information on loss and damage financing needs in

different categories reported by developing countries. This can serve as a basis for a first-order estimate of currently known and quantified loss and damage financing needs.

In addition, it can be expected that in particular BTRs submitted under the ETF will provide a rich source of information on loss and damage financing needs in the future. The modalities, procedures, and guidelines for producing BTRs, contained in Annex I to decision 18/CMA.1 (UNFCCC 2019b), include a sub-section for reporting on ‘impacts, risks, vulnerabilities’ (Section IV B) and a sub-section for reporting ‘information related to averting, minimising and addressing loss and damage associated with climate change impacts’ (Section IV G). Mandated with issuing guidance for reporting under the ETF, the Consultative Group of Experts has produced guidelines for reporting information under these respective sections (Consultative Group of Experts 2023). Under the loss

and damage-specific sub-section these guidelines provide a list of loss assessment methodologies and loss databases as currently implemented by different institutions. They also refer to the different types of costing information that can be reported.

Table 4 lists these and other sources under the UNFCCC where nationally reported information on loss and damage financing needs may be found.

Table 4: Potential sources of information on loss and damage financing needs reported by developing countries under the UNFCCC.

Document	Context	Reporting /updating frequency
NDCs (Nationally Determined Contributions)	The main purpose of NDCs as framed by Article 4 of the Paris Agreement is to reflect contributions that countries are planning with regard to the reduction of GHG emissions on a five-yearly basis (UNFCCC 2015). However, some observers have called for inclusion of loss and damage-related information in NDCs such as to enhance the issue's visibility and give context to the urgency and support needs of developing countries (Rai and Acharya 2020).	5 years
NAPs (National Adaption Plans)	NAPs encompass medium- and long-term adaptation needs and present national strategies and programmes to address those needs. Initially scoped for least developed countries only, increasingly other developing countries have been submitting NAPs (54 at 18 April 2024) (napcentral n.d.). As NAPs often include vulnerability assessments, they sometimes contain information on loss and damage implicitly or explicitly.	n/a
BTRs (Biennial Transparency Reports)	BTRs capture a wider range of information related to national climate action, ranging from progress towards achieving nationally determined mitigation goals, climate change impacts and levels of support needed or provided. The 'climate change impacts and adaptation' section explicitly provides space to report on loss and damage, and the Consultative Group of Experts, mandated with producing guidance for BTRs, has issued a manual for reporting loss and damage financing needs (Consultative Group of Experts 2023).	2 years (first due December 2024)
BURs (Biennial Update Reports)	As outlined by the Standing Committee on Finance, 'non-Annex I Parties should provide updated information on financial support received from the GEF [Global Environment Facility] [...] As at 30 June 2022, 79 non-Annex I Parties had submitted BURs, up from 63 in the fourth (2020) BA. Six more Parties have submitted a second BUR, 12 a third BUR and 8 more Parties have submitted a fourth BUR since the fourth (2020) BA. The share of BURs with information on climate finance received has continued on an upward trend reaching 97 per cent in 2021 and 86 per cent of the BURs submitted in the first half of 2022.' (UNFCCC 2022b). Some of these BURs (e.g. the Bahamas, Guyana) include information on incurred losses.	2 years

Document	Context	Reporting /updating frequency
NCs (National Communications)	Upon entering the Convention, developing countries were requested to regularly submit reports on their national and regional development priorities and circumstances that form the backdrop of their climate action plans. NCs are geared towards both mitigation and adaptation, and may contain information on national vulnerability to climate change.	4 years
TNAs (Technology Needs Assessments)	TNAs were initiated by but are not requested under the UNFCCC. Still, their submissions are summarised in UNFCCC synthesis reports. TNAs are supported by UNEP and the Global Environment Facility. According to the fourth synthesis report, ‘in the TNA reports for adaptation, almost all of the Parties included a reference to the potential vulnerability of the country to climate change.’(UNFCCC 2020)	n/a

4.2 SCF Reports on needs of developing country Parties

In addition to nationally reported estimates, aggregate reports produced by the Standing Committee on Finance (SCF) present a possible source of information on loss and damage financing needs. This is particularly the case going forward: starting in 2020, the SCF will prepare, every four years, a report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement. In addition to drawing on existing national reporting, the SCF has issued a ‘call for evidence’ to inform such a needs assessment. Depending on whether developing countries will respond to this call for evidence with loss and damage-specific information (deadline is 30 June 2024), the resultant second report will include additional information on the issue (expected in 2024).

4.3 Post-Disaster Needs Assessments

Initially conceived to report losses and financing needs related to natural disasters, a number of existing assessments and databases have over time come to capture also climate-related financing needs.

Some countries rely on post-disaster needs assessments (PDNAs) to quantify their financial needs for loss and damage (Thomas and Benjamin 2017). The PDNA methodology was built upon the Damage and Loss Assessment (DaLA) methodology, developed by the United Nations Economic Commission for Latin America and the Caribbean in 1972. The PDNA included the main elements of the DaLA methodology and also incorporated Human Recovery Needs Assessment (HRNA) approaches (European Commission, United Nations Development Group

2013). PDNAs aim to be extensive in their approach and can be used to evaluate: the effects of a disaster on infrastructure and assets; service delivery and access to goods and services; governance and social processes; and underlying risks and vulnerabilities. Additionally, they may provide the basis for quantitative estimates on the damage and loss to physical infrastructure, productive sectors, and

the economy, including macro-economic impacts. This assessment of effects and costs can then be used to develop a recovery strategy that identifies, prioritises, and provides the costs of recovery and reconstruction needs.

PDNAs can be used to assess the effects and recovery needs in a range of sectors, as detailed in **Figure 3**.

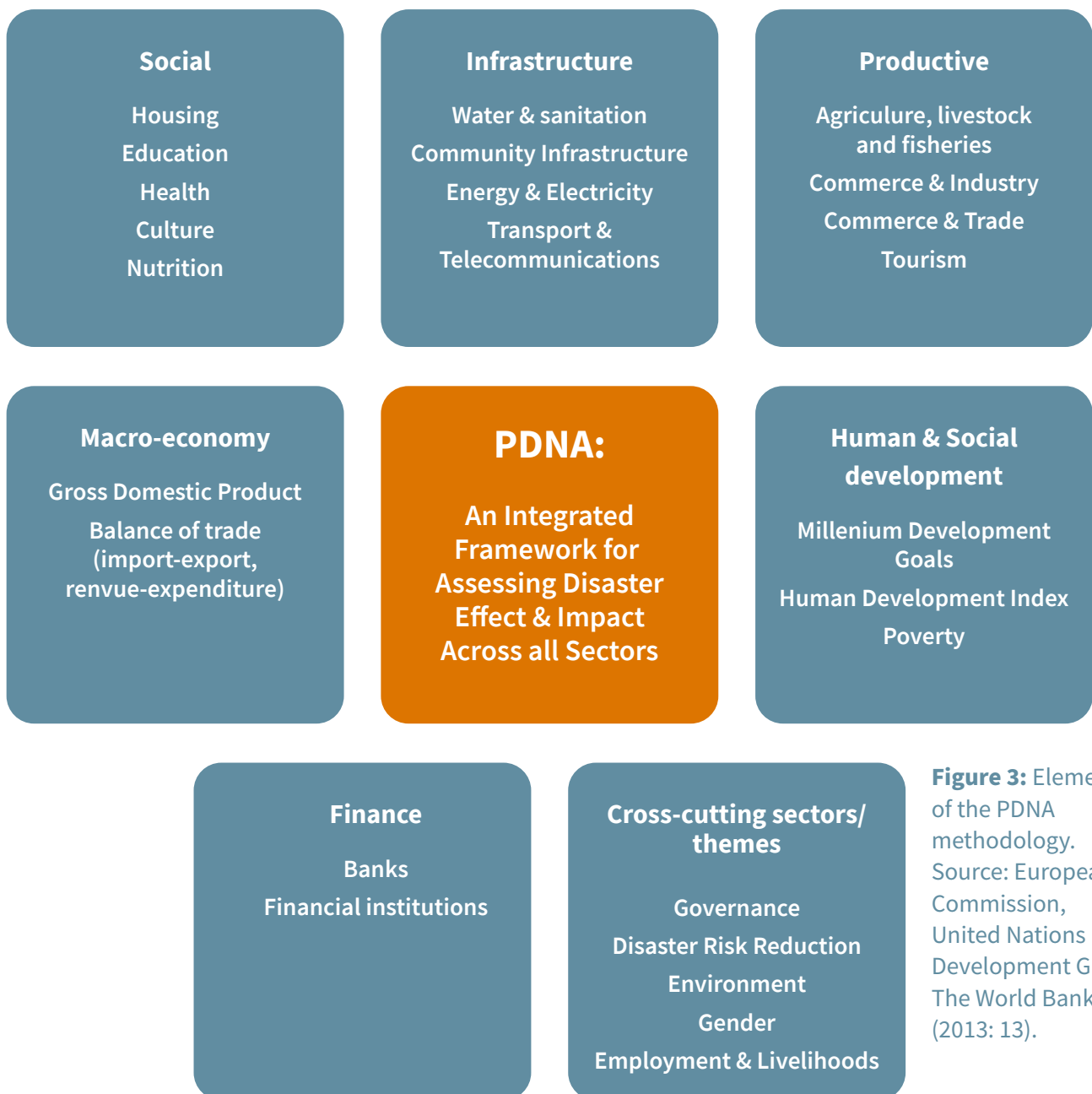


Figure 3: Elements of the PDNA methodology. Source: European Commission, United Nations Development Group, The World Bank (2013: 13).

Table 5: Overview of select disaster loss databases.

Source: Adapted from (Gall 2015) and (Guha-Sapir and Below 2002).

	EM-DAT	DesInventar	Insurance databases
Scope	<p>Disasters triggered by natural hazards and technological disasters resulting in at least either of the following:</p> <ul style="list-style-type: none"> ■ At least ten deaths (including dead and missing). ■ At least 100 affected (people affected, injured, or homeless). ■ A call for international assistance or an emergency declaration. 	<p>Meteorological, hydrological, geological, biological, technological, and chemical events</p>	<p>Natural and man-made disasters (excluding drought)</p>
Spatial resolution	Country	County/municipality	Country
Information types/impact variables	<p>Total economic damage, reconstruction costs, and insured damage (all USD); people affected and death toll</p>	<p>Human deaths; number of people affected: directly and indirectly; loss value: in local currency and in USD; houses affected and destroyed; other damages: buildings and educational institutes etc.; agriculture area affected</p>	<p>Deaths, people injured, economic losses in USD</p>
Data sources	<p>UN agencies, International Federation of Red Cross and Red Crescent Societies, World Bank, reinsurers, press, news agencies, etc.</p>	<p>UN agencies, weather services, geological services, press, etc.</p>	<p>Diverse, including daily newspapers, Lloyd's list, Primary insurance and reinsurance periodicals, internal reports, online databases</p>
Access	Public	Public	Not public

However, there are also a number of challenges with the PDNA methodology. A review of the effectiveness of PDNA found that there needs to be a broader interpretation of disasters and their impacts. This is required in order to capture the needs of smaller countries or atypical recovery requirements when fewer people are affected or less recovery costs arise as compared to disasters that affect more populous areas (Jeggle and Bogger 2018). The time frame for conducting a PDNA is very short, often occurring during or soon after the humanitarian phase, and takes place during disrupted conditions. PDNAs are necessary as soon as possible after a disaster occurred to identify recovery needs and garner support. However, the rapid nature of the PDNA approach might entail operational challenges that result in an assessment that misses key inputs. These might include field evaluations of impacts, collection of data, inputs from non-government stakeholders about social and human development needs, inclusion of effects in outlying areas, and meaningful inclusion of most vulnerable, socially marginalised groups and those with special needs. Also, longer-term financing needs will naturally not be covered if they arise after a PDNA was issued.

A publicly accessible database of PDNAs has been developed, hosted by the Global Facility for Disaster Reduction and Recovery.^[5] It covers a range of climate-related disasters, including floods, droughts, tropical cyclones, and heavy rain events. Accordingly, the financial needs estimated in climate-related PDNAs can be extracted and aggregated to result in an aggregate loss and damage finance needs estimate that is reflective of extreme events, while fully acknowledging the limitations regarding longer-term needs and those related to slow onset events.

4.4 Disaster loss databases

Public databases on disaster losses outside the UNFCCC provide another potential source of information on partial (a subset of) loss and damage financing

needs (**Table 4**). In addition, national or regional disaster loss databases exist, most of which deploy the DesInventar methodology (Gall 2015).

Depending on the approach chosen to determine which or what share of climate-related events classify financial resources (needs or sources) as loss and damage, respective entries in these databases can be used to inform an aggregate loss and damage financing needs assessment, subject to the same limitation as mentioned in the context of PDNAs above.

4.5 Integrating perspectives of local communities

As outlined above, most national reports capture only major disasters. Although the DesInventar database is explicitly geared at reflecting events also below the threshold in the Emergency Events Database (EM-DAT), local perspectives are likely to be missed there too, particularly as they pertain to strategies and costs of dealing with the effects of slow onset events. In an effort to reduce the data gap that results from this scope, it would be necessary to systematically check the availability of further such sub-national reports on local views.

Thus, sub-national reporting by various actors should be a source of information on loss and damage financing needs in addition to nationally driven reports. As climate impacts have accelerated, methodologies have emerged that use the specific UNFCCC understandings of loss and damage to conduct assessments.

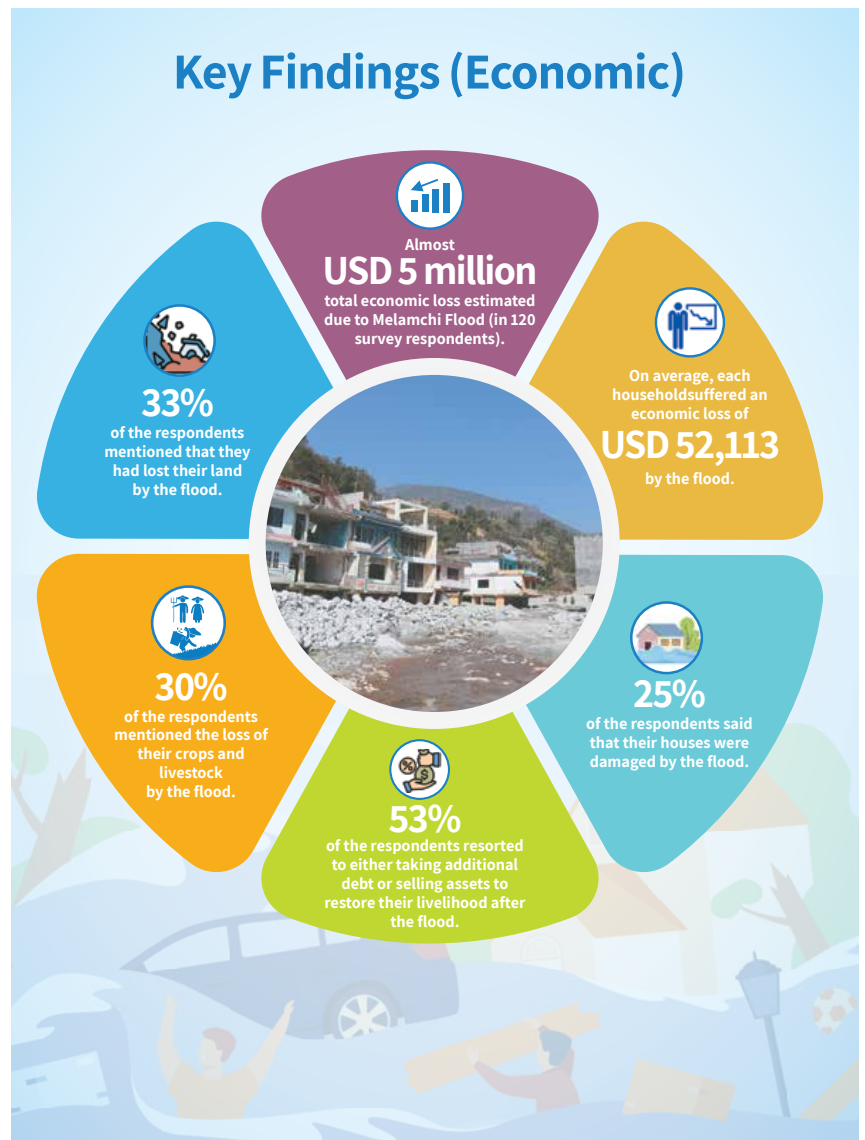
A notable advancement is the locally-led loss and damage assessment done for the 2021 Melamchi flood in Nepal Deep (Parajuli et al. 2023). This assessment specifically defines loss and damage in the context of Nepal, noting that their understanding is based on a global discourse. The assessment highlights that existing post-disaster assessments, such

5 Published at: www.gfdr.org/en/post-disaster-needs-assessments (accessed 27 August 2024).

as PDNA, mostly focus on assessing economic losses and occur in a short time frame after a disaster. Their methodology addresses these shortcomings in two ways: by conducting an in-depth assessment of both economic and non-economic loss and damage, and by looking at the long-term consequences of the disaster to identify persistent needs of the communities that were affected.

A mixed-methods approach was used drawing on both primary and secondary data analysis. Importantly, inputs from affected communities were prioritised through municipal consultation workshops, focus group discussions, household surveys, key informant interviews and case analysis. Identification of locally led solutions was also prioritised. This approach allowed for a detailed assessment of both economic and non-economic loss and damage that was incurred at the household level, including impacts on mobility, education, cultural and religious sites and mental health as detailed in **Figure 4**.

Emerging methodologies such as this provide a starting point for locally-led assessments of loss and damage that identify an array of impacts and allow for agency at the local level. These types of methodologies are also valuable in assessing loss and damage associated with smaller-scaled disasters or disaster effects in more remote areas, where larger government-led assessments such as PDNA face challenges. These emergent methodologies also specifically frame impacts as loss and damage and make the connections to climate change. This is an advantage over PDNAs, which only implicitly allow for linking loss and damage to specific climate change events. With their focus on climate-related extreme events, such methodologies do not elucidate the financing needs related to slow onset events.



4.6 Efforts to capture the costs related to slow onset events

The costs related to slow onset events often escape available estimates of loss and damage finance needs, with existing approaches and methods being more geared towards extreme events. An explicit effort ought thus to be made to capture available information.

Slow onset events as framed under the UNFCCC, refer to the risks and impacts associated with increasing temperatures, desertification, loss of biodiversity,

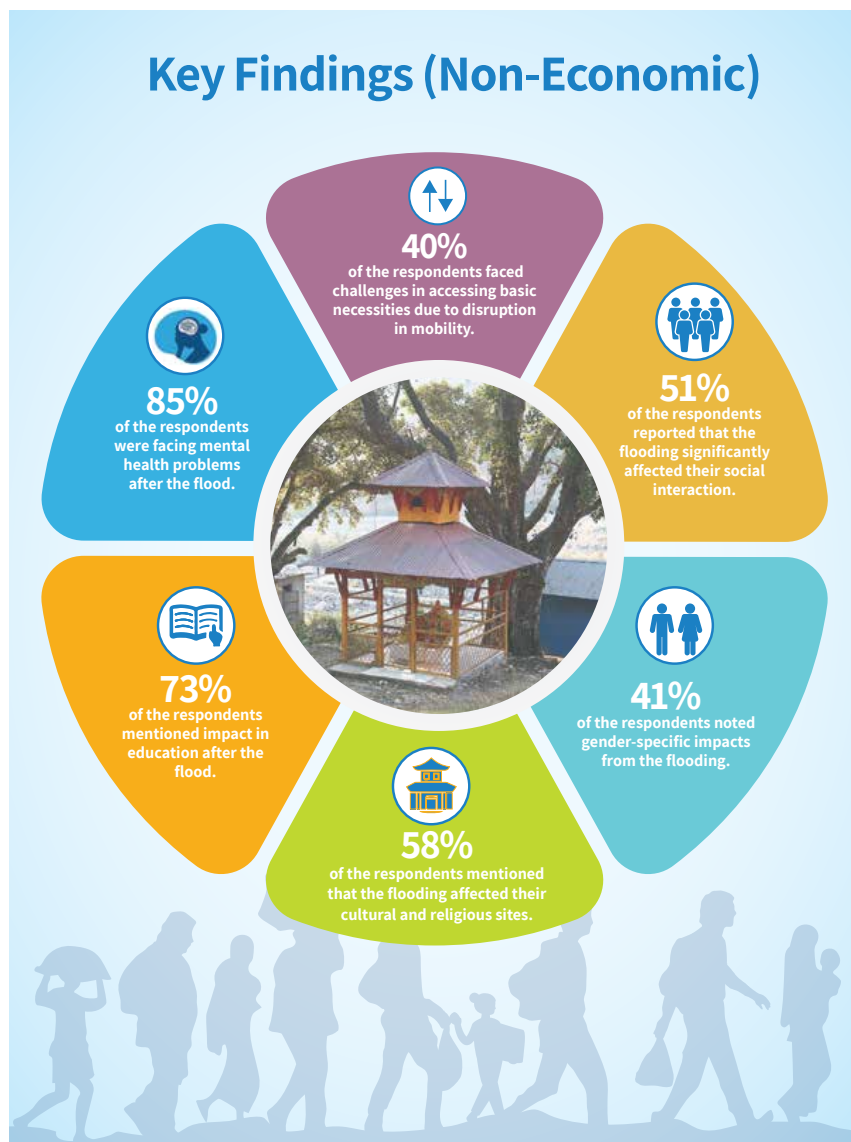


Figure 4: Key findings of economic and non-economic loss and damage for the 2021 Melamchi Flood. Source: Parajuli et al. (2023: X–XI).

to review available estimates of the costs associated with slow onset events per event type. Notably care would need to be taken to avoid double counting where the effects of slow onset events might already be reflected in modelled sectoral estimates (e.g. in the fisheries sector for the case of ocean acidification).

4.7 Modelled estimates

A number of studies have attempted to determine the costs of loss and damage in developing countries, using different metrics as loss and damage proxies. As detailed in **Table 6**, there are different groups of countries considered, different approaches used, and a resultant broad spectrum of costs that include both costs already incurred and projected future costs. Notably, most of these methodologies do not include non-economic loss and damage, such as loss of biodiversity and impacts on mental and physical health and wellbeing, and present a mix of the costs of losses and damages incurred and the costs of activities to address these losses and damages.

In addition to such aggregate estimates, sectoral loss estimates should be reviewed and considered, avoiding double counting where sectoral losses are already reflected in aggregate estimates.

land and forest degradation, glacial retreat and related impacts, ocean acidification, sea level rise, and salinisation.

One possible approach for capturing available evidence of costs lies in searching for economic estimates of loss and damage or activity costs for specific large slow onset events across different regions. For example, various efforts have been made to estimate the value losses from ocean acidification (e.g. Brander et al. 2012; Speers et al. 2016). Although data gaps are likely to be prevalent particularly for developing countries, an explicit effort should be made

Table 6: Studies assessing incurred and projected loss and damage costs.

Sector	Coverage	Overview of approach	Findings
Backward looking costs of loss and damage			
Baarsch, Awal and Schaeffer (2022)	V20* (58 countries)	Uses two econometric models to assess climate change-attributable economic losses	From 2000 to 2019, climate change has eliminated 20% of the wealth of the V20; V20 economies have lost approximately USD 525 billion.
Estimates of current costs of loss and damage			
Tavoni et al. (2024)	Global, disaggregated by income levels	Combining evidence from statistical and process-based climate economic models.	For 2025, USD 249 billion per year for lower-middle income nations, and USD 13 billion per year for low-income countries.
Forward looking costs of loss and damage			
Markandya and Gonzales-Eguino (2018)	Non-Annex I group: MENA, SSA, SASIA, China, EASIA, and LACA	Uses economic Integrated Assessment Models (IAMs) to calculate economically optimal responses to climate change mitigation and adaptation in terms of maximising GDP in the future. Interprets modelled residual damages as unavoided loss and damage.	Total residual damages for these regions range from USD 116–435 billion in 2020, rising to USD 290–580 billion in 2030, USD 551–1,016 billion in 2040 and USD 1,132–1,741 billion in 2050.
UNCTAD (2023)	Developing countries	Estimated the baseline scale of funding needed for the loss and damage Fund based on past costs of catastrophic disasters in developing countries.	Minimum of USD 150 billion per year, increasing every year. For example aiming for a replenishment of USD 300 billion by 2030.

* The Vulnerable Group of Twenty.

Sector	Coverage	Overview of approach	Findings
IFRC (2019)	Global	Estimates of per-capita cost of aid were combined with an estimate of the number of people in need of emergency aid every year due to climate-related disasters to explore different possibilities of how humanitarian needs will evolve in the future, depending on socio-economic trends and policy choices.	USD 20 billion per year by 2030 for humanitarian funding requirements for climate-related disasters. By 2050, 200 million people annually could need international humanitarian aid.

KEY MESSAGES FROM THIS SECTION:

- Loss and damage of asset values and activity costs (both to economic and non-economic loss and damage) are the two basic cost categories comprising loss and damage financing needs, none of which are comprehensively reported.
- Some limited information on loss and damage financing needs can be extracted from national reports under the UNFCCC.
- PDNAs, SCF reports, disaster loss databases, sub-national reports, and academic studies can be additional sources of information on loss and damage finance needs, noting the prevalent gap on information for financing needs to address slow onset events.

SOURCES OF INFORMATION

ON SUPPORT PROVIDED

As mentioned in **section 3**, various initiatives have traced the support of loss and damage finance, using different categories to tag respective finance flows.

For the purpose of extracting and synthesising information on financial support provided to address loss and damage, in principles three approaches emerge which are not mutually exclusive. Pledges can be marked as loss and damage support provided if:

- i. they are explicitly marked as such by the contributor,
- ii. they fund any of the activities reflected in the proposed loss and damage finance marker,
- iii. a machine learning tool identifies resources as supporting the activities reflected in the proposed loss and damage finance marker.

The following sections spell out each of these approaches in more detail.

5.1 Explicit loss and damage pledges

COP26 in Glasgow marked the onset of financial pledges explicitly dedicated to loss and damage. The Scottish Government was the first developed country to earmark finance to address loss and damage with a pledge of GBP 2 million (Schalatek and Roberts 2021). The Government of the Belgian region of Wallonia followed suit with a pledge of EUR 1 million (Schalatek and Roberts 2021) and the Danish Government with a pledge of USD 13 million (Lo 2022). Five philanthropies also together committed USD 3 million for loss and damage.

COP28 in 2023 marked the onset of initial pledges to the Fund for responding to Loss and Damage. Initial pledges from developed and developing countries were followed by further pledges communicated throughout 2024, resulting in USD 679.7 million as of 9 July 2024 (Thwaites 2024). As resources will start flowing through the fund, its activities would need to be monitored for the purpose of a loss and damage finance gap report.

5.2 Mapping loss and damage support provided by use of OECD Purpose Codes

As noted by the TC's Synthesis Report authors (UNFCCC Transitional Committee 2023: 10), funding to address loss and damage in the context of extreme events can be approximated fairly thanks to such funding often being marked specifically by funding agencies.

On the dedicated funding windows, programmes, and facilities, the Synthesis Report authors identify a range of possible sources. Examples include the Expanded Disaster and Pandemic Response Facility, operated by the Asian Development Bank, or the Catastrophe Deferred Drawdown Option (Cat DDO) operated by the World Bank. In principle, resources flowing through funding streams dedicated to providing liquidity in the event of a climate-related disaster would count towards loss and damage support provided.

Extracting this information would thus require a case-by-case analysis of the event motivating the flow of resources.

On the resources marked by relevant codes, the OECD marking matrix (underlying the CRS) can be used to identify loss and damage specific activities respectively funded. Using its 'purpose codes', resource flows are marked according to the sector or specific policy they target in the recipient country (OECD n.d.). These purpose codes include the following codes that are of particular relevance in the loss and damage context:

- 600: VII. Action Relating to Debt, Total
 - 60010: Action relating to debt
 - 60020: Debt forgiveness
 - 60030: Relief of multilateral debt
 - 60040: Rescheduling and refinancing
 - 60041: Debt for development swap
 - 60062: Other debt swap
 - 60063: Debt buy-back
- 700: VIII. Humanitarian Aid, Total
 - 720: VIII. 1. Emergency Response, Total
 - 72010: Material relief assistance and services
 - 72040: Emergency food assistance
 - 72050: Relief co-ordination and support services
 - 730: VIII. 2. Reconstruction Relief & Rehabilitation, Total
 - 73010: Immediate post-emergency reconstruction and rehabilitation
 - 740: VIII. 3. Disaster Prevention & Preparedness, Total
 - 74020: Multi-hazard response preparedness

Depending on the scope of loss and damage finance chosen (see [section 3.3](#)), aggregate resources marked for respective loss and damage activities following the above purpose codes can be calculated as loss and damage support provided. Again, this would require a case-by-case analysis of the specific event

that motivated the flow of resources, and extraction of numbers for cases that are considered to be climate-related.

One potential drawback of relying on these purpose codes is that these codes can only be assigned once to a given entry, and alternative codes are mostly sectoral. This means that the use of the above reflected codes may result in not capturing relevant support reported under other sectoral codes than those listed above. For example, support may have been provided to offer outside labourers alternative livelihoods due to temperatures rising above bodily thresholds. While this would fall under loss and damage support following the working definition in [section 3.3](#), it would likely be reported under the purpose code of ‘employment creation’ rather than ‘rehabilitation’.

5.3 Text mining

Another approach towards identifying relevant support provided could be applying the tool of text mining

(Niekler and Wencker 2019). Text mining is a machine learning method for Natural Language Processing that combines human analysis of causal patterns with computational skills to process large amounts of data. It is increasingly being used in the evaluation of climate finance or development co-operation. For example, Borst, Wencker, and Niekler (2023), and Niekler and Wencker (2019) trained a model to estimate the amount of overreporting of adaptation finance in the OECD CRS database.

In principle, text mining could be applied to identify financial support provided for loss and damage activities following a clear list of activities and climatic conditions. However, as Niekler and Wencker (2019: 1) observe, ‘data acquisition and management can be expensive, long workflows can be time consuming, and initial development requires programming skills’. The workload and time to train a model would need to be estimated and considered when planning for the publication of the loss and damage Finance Gap Report, including budget and timeline.

KEY MESSAGES FROM THIS SECTION:

- Loss and damage financial support provided can be assessed in three ways:
 - i. calculating explicit pledges,
 - ii. selecting information from the OECD CRS based on thematic codes reflecting loss and

- damage activities from database for climate-related events,
- iii. using machine-based learning tools to extract financial support provided for loss and damage activities.

6 OPTIONS

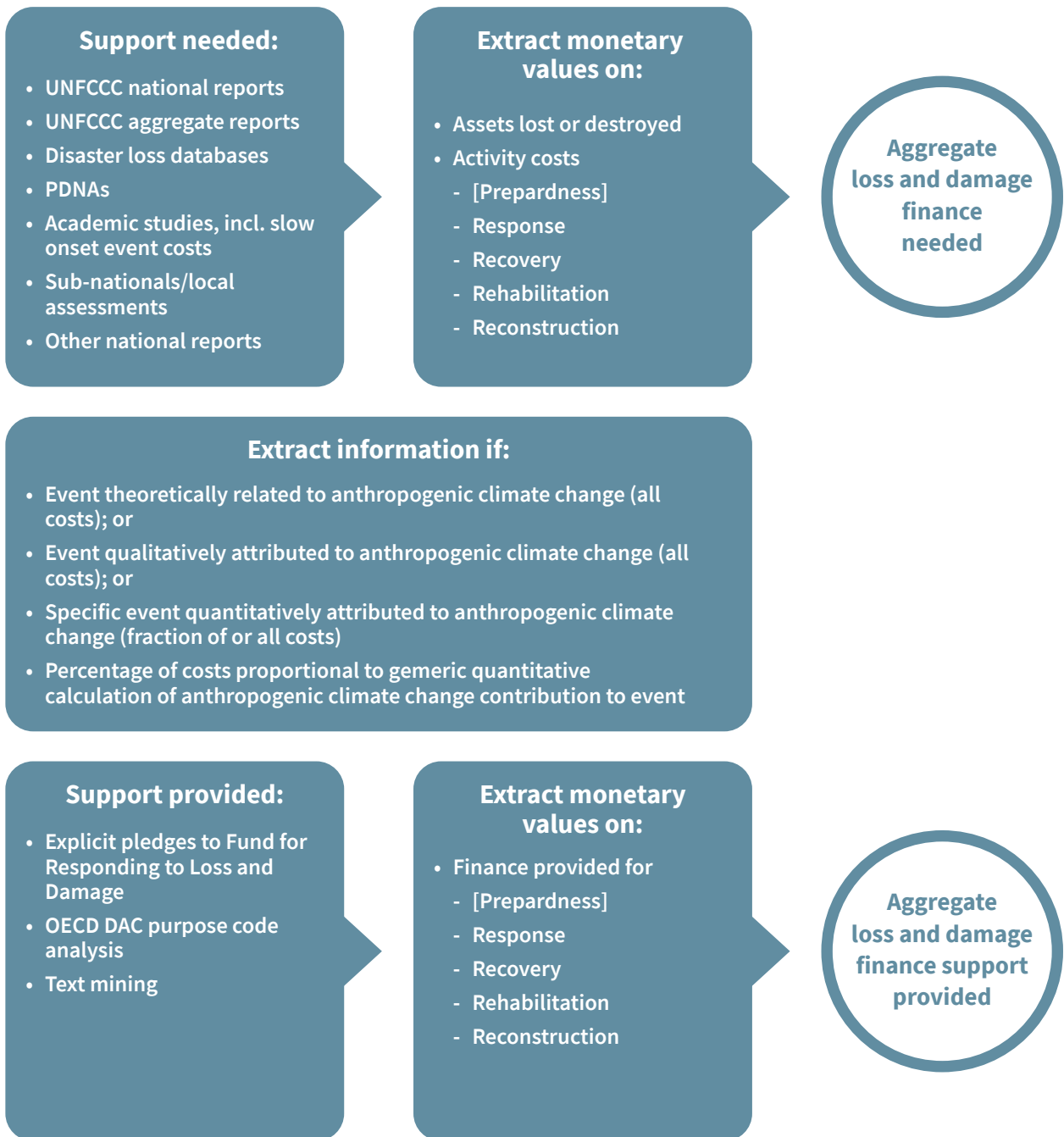
FOR LOSS AND DAMAGE FINANCE GAP REPORT

A preliminary and partial loss and damage finance gap can in principle be calculated using the working definition of loss and damage through activities as proposed in **section 3.3** and sources of information as outlined in **sections 4 and 5**. **Figure 3** gives an overview of the types of data and relevant sources for aggregating both loss and damage finance needs and loss and damage financial support provided.

In order to calculate the gap between loss and damage financing needs in developing countries and the financial support provided by developed countries, an aggregate of needs is first required. The potential sources for aggregating this sum are a collection of national supports as provided by countries under the UNFCCC, disaster loss databases, reports by civil society organizations or academic studies (see **section 4** of this report). As in the UNEP Adaptation Gap Report, academic estimates on loss and damage financing needs could be combined with aggregate nationally reported needs to arrive at a range spanning bottom-up and top-down approaches. For the calculation of aggregate needs, data harmonisation as conducted in the analysis underlying the UNEP Adaptation Gap Report should be considered.

Figure 5: Overview of data types and sources for aggregating loss and damage finance needed and support provided.

Note that options for selecting the evidence base ('extract information if') and scope of loss and damage activities ('extract monetary values') need to be selected by authors prior to calculating the loss and damage finance gap.



Aggregating the sum of resources provided, on the other hand, can be achieved through extracting numbers explicit pledges to the new Fund for Responding to Loss and Damage, the OECD database and applying a text mining approach to screen available sources of information (including bilateral) (see [section 5](#)). Given the heavy debt burden of many developing countries, the suitability of loans as an instrument to finance activities in response to loss and damage has been seriously questioned. Any reporting should transparently indicate both the nominal/face value and grant-equivalent value. While such distinction is often difficult for the case of national pledges, the OECD database would allow for it.

In both cases, support needed and provided, applying the working of loss and damage finance as proposed in [section 3.3](#) would allow for selecting the amounts that can be tagged as “loss and damage”. This means that both needs and support provided would primarily be defined by the types of activities that resources are spent on, plus a consideration of the role that climate change played in making these spending needs come about. Both, the finite spectrum of activities and the type of evidence required to “prove” climate-related loss and damage would first need to be decided upon by the authors (and are hence bracketed in the text or given as options). Further, a number of methodological challenges would need to be addressed in order to potentially cover data gaps and avoid the risk of double counting, as briefly addressed in the following.

6.1 Extrapolation to cover geographical and thematic gaps?

The data gaps particularly on loss and damage financing needs are apparent in [Figure 1](#) and [Figure 2](#) above: not all countries report on them in the national documents analysed, nor are all cost categories covered in any national document under the UNFCCC. Collecting information from a wider range of sources might ameliorate some of these shortcomings. PDNAs, for example, include estimates of recovery costs

which are typically missing from UNFCCC documents. However, as noted by Gall (2015), national disaster reporting mostly excludes indirect loss estimates (due to disruption of economic activity) and do not account for the impacts of slow onset events. Comparing EM-DAT with DesInventar entries for select Pacific Island Countries, Noy (2015) shows that the EM-DAT database underestimates losses from small events in small and remote countries. Furthermore, the reconstruction costs of damages to physical infrastructure are likely underestimated even in DesInventar, as they are modelled without reflecting the relatively higher costs of infrastructure in remote locations.

A specific gap also emerges as information on the costs related to slow onset events are rarely captured in existing national reports or databases. Given these and other known reporting challenges, gaps in thematic and regional coverage would likely persist.

As mentioned in [section 2](#), the adaptation financing needs underlying the UNEP Adaptation Gap Report extrapolate per-capita (or per-income group) finance from nationally reporting adaptation finance needs to compensate for gaps in geographical coverage. While adaptation is a more gradual process in preparation of partly gradual increases in climatic variables, loss and damage financing needs are more dependent on the occurrence of climate-related disasters and relative exposure to slow onset processes such as sea-level rise. More thought would thus need to be given to the question of potential approaches towards extrapolation of loss and damage financing needs, which is unfortunately outside the scope of this report.

6.2 The risk of double counting

Loss and damage financing needs that resulted from particular events are likely to be reported in multiple sources, e.g. a country’s PDNA and NAP or NDC. In order to avoid the risk of double counting, each entry should be given a marker to tie it to a particular event. This would also increase transparency regarding the question of attribution, and whether the entire share

of reported costs are considered as loss and damage needs (the inclusive or qualitative approach) or only a share of reported costs (the quantitative approach; see also [section 3.2](#)).

Another potential risk of double counting emerges when combining sectoral and aggregate needs estimates. As the same challenge would be expected to arise when calculating the adaptation finance gap, relevant lessons learnt should be reflected and transferred to the case of loss and damage.

The risk of double counting also occurs when calculating the amount of loss and damage support provided. To the extent possible, pledges and contributions should be given markers that prevent resources being calculated twice. Differentiation between 'principal' and 'significant' objectives should also be considered, as is standard for the mitigation and adaptation markers, and guidelines for avoiding double counting accordingly followed.

7 NEXT STEPS

7.1 Determining and securing an institutional host

Various actors would need to take different steps for a first version of a loss and damage finance gap report. Crucially, an official ‘Loss and Damage Finance Gap Report’ would need to be hosted (i.e. published and potentially also financed) by a recognised international institution, ideally under the UN, similar to the UNEP Adaptation and Mitigation Gap Reports. UN reports frequently feature in agreed lists of sources, for example as input to the First Global Stocktake. This means that they are ‘trusted’ sources enjoying the credibility needed for information to be considered politically in the context of negotiations.

In the past, many UN-based organisations have shied away from publishing on the politically contentious issue of loss and damage, in particular loss and damage finance. However, there is arguably sufficient technical basis to issue analytical products under the UN umbrella, given the establishment of the Fund for responding to Loss and Damage and concurrent technical work that has resulted in a de facto operational

definition of loss and damage finance. Possible outlets include UNEP, UNDP, UNCTAD or, for a more narrow focus, the UN Office for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS). Potentially, an invitation by the UNFCCC to issue such a report could further inspire positive responses.

An additional benefit of publishing a loss and damage finance gap report under the UN would be to avoid potential overlaps with the Adaptation Gap Report. Methodological clarity regarding whether resources particularly in the field of preparedness, transformation, and resilient recovery ('building back better') are counted as adaptation or as loss and damage could be more easily garnered under one institutional roof.

Once an institutional host is found – or in parallel to finding one – an initial list of authors would need to be determined to cover the relevant aspects of a loss and damage finance gap report as outlined in this report. Financial resources for the publication would also need to be secured.

7.2 Determining the scope of loss and damage finance

Another consideration, already touched upon and integrated in the proposed loss and damage finance marker, is whether to include preparedness and


response within the scope of activities delineating loss and damage finance. It would need to be strategically considered how to arrive at such a decision and who should do so.

Depending on the scope of the working definition of loss and damage finance operationalised in a loss and damage finance gap report, careful consideration of potential connections with the Adaptation Gap Report would be needed. The risk of double counting is apparent for both support needed and provided. However, it is equally clear that methodological rigour and transparency can reduce this risk.

7.3 Determining the meaning of 'climate-related'

As outlined in [section 3.2](#), various approaches exist to determine whether an event and associated loss and damage needs can be considered as 'climate-related'. Similar to consideration on scope, a set of actors would need to determine which approach to choose for calculating an aggregate loss and damage finance gap.

Alternatively, a loss and damage finance gap report could apply a set of approaches and report numbers according to the approach chosen (e.g. all costs incurred by use of the integrative approach, compared to a fraction of costs incurred by use of the FAR approach).



CONCLUSIONS AND OUTLOOK

Capacity building support will be needed in tandem with methodological developments in order for developing countries to be better placed to determine and articulate their loss and damage financing needs.

Current institutional developments around loss and damage under the UNFCCC may result in ever more sources of information on support needed becoming available. As the Santiago Network will implement its mandate to catalyse technical assistance for the implementation of loss and damage activities in developing countries, it can be expected that a growing number of loss and damage needs assessments will become available. Depending on the final institutional set-up of the Fund for responding to Loss and Damage, these may also be expected to arise from the Fund, possibly in combination with support from the Santiago Network. As reporting standards and national reporting capacities evolve, in particular in context of the ETF and related biennial reports, the data density and quality is likely to increase also in this context.

Methodologically, particularly estimating prospective recovery needs requires attention. Future recovery costs would need to be projected along a number of plausible climatic and adaptation futures, given that recovery needs depend on both the intensity and frequency of climatic impacts and considering the level of adaptation that is de facto feasible to reduce risks.

In addition, the longer-term and indirect costs of climate-related loss and damage need to be systematically accounted for in assessments of aggregate loss and damage financing needs. Here, methodological challenges are set to arise, as combating indirect effects will mean spending in societal sectors, such as education or health, which is currently accounted for under development or adaptation finance.

These gaps and challenges notwithstanding, sufficient data exists to start informing the policy debate around the need for loss and damage finance empirically. Notably, given persistent data limitations particularly on needs in developing countries (**section 4**), such a gap analysis would necessarily be a first approximation rather than result in a definitive statement.

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APPENDIX

List of events influenced by climate change, per developing countries region

Event	Developing countries region where events are influenced by climate change with medium to high confidence
Tropical cyclone	All affected by event
Agricultural and ecological drought	North Africa, West and East Southern Africa, Madagascar, Southern and Northern Central America, Northern South America, South American Monsoon Region, North-Eastern South America, South-Western America, Southern South America, Caribbean
Extreme heat	All affected by event
Mean temperature	All affected by event
River flood	Central Africa, East Asia, East Central Asia, Tibetan Plateau, South Asia, South East Asia, South American Monsoon Region, South-Eastern South America
Heavy precipitation and pluvial flood	Sahara, Western Africa, Central Africa, North Eastern Africa, South Eastern Africa, East Southern Africa, Madagascar, Arabian Peninsula, West Central Asia, East Asia, East Central Asia, Tibetan Plateau, South Asia, South East Asia, Northern South America, South American Monsoon Region, North-Eastern South America, South-Eastern South America, Southern South America, Pacific
Landslide	West Central Asia, East Asia, Tibetan Plateau, South Asia, South East Asia, South American Monsoon Region
Aridity	North Africa, West Southern Africa, East Southern Africa, West Central Asia, East Asia, Southern Central America, Northern South America, South American Monsoon Region, North-Eastern South America, South-Western South America, South-Western South America, Caribbean, Pacific
Fire weather	North Africa, West Southern Africa, East Southern Africa, West Central Asia, East Asia, East Central Asia, South Asia, Southern Central America, Northern South America, South American Monsoon Region, North-Eastern South America, South-Western South America, Southern South America
Severe wind storm	North Africa

Event	Developing countries region where events are influenced by climate change with medium to high confidence
Relative sea level	All affected by event
Coastal flood	All affected by event
Coastal erosion	All affected by event
Marine heatware	All affected by event
Ocean and lake acidity	All affected by event

Source: IPCC Working Group I (2021: Table TS.5, 122–129).

