Re-conceptualizing climate change-driven “loss and damage”

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Abstract

This article reviews loss-and-damage scholarship, to explore the potential impact of separating ‘loss’ and ‘damage’, both in the context of research and policy. A key result presented in the article is that treating ‘loss’ and ‘damage’ separately would be most beneficial with regard to loss, in that the political hurdles that currently mar the loss-and-damage debate mainly derive from disagreement over financing responsibilities with regard to damages, which unduly slows progress on the urgent task of understanding how to manage loss. In this context, the article provides elements for separate definitions of ‘loss’ and ‘damage’, and suggests a possible categorisation of loss-and-damage scholarship.

Keywords

residual climate-change impacts; limits to climate-change adaptation; loss; damage; UNFCCC; Warsaw International Mechanism; soft adaptation limits; hard adaptation limits, climate justice; climate finance; Paris Agreement.

Biographical note

Daniel Puig received his PhD from the Technical University of Denmark. His research touches upon the effectiveness of policies to manage climate change, with a recent focus on climate change-driven loss. He has worked for an international consulting company, the United Nations Environment Programme, and the Technical University of Denmark.

1. Introduction

The periodic assessments by the Intergovernmental Panel on Climate Change indicate that, for some of the impacts of climate change, adaptation measures are failing to protect human and biophysical systems (Klein et al., 2015). In the scientific literature, impacts that occur after adaptation are known as 'residual impacts', in contrast to impacts that are prevented through adaptation, or 'avoided impacts'.

Residual impacts arise because adaptation measures are insufficient or ineffective, or because adaptation limits are exceeded. In international climate-change negotiations, both classes of residual impacts are amalgamated in the thus far undefined set of issues referred to as 'loss and damage'. Yet, these two classes of residual impacts differ markedly in aspects that are of direct relevance to the policy process (Table 1).

Against this background, the objective of the article is to make the case for separating these two classes of residual impacts, with regard to both intergovernmental climate-change negotiations and research. In doing so, and drawing on the literature on loss, the article underscores the urgency of increasing our understanding about how to delay or prevent loss, when this is possible, and how to manage loss, when loss occurs.

Not least, the article makes two recommendations for the research community. First, an unambiguous definition of loss and damage should be agreed upon, articulated around the well-established concepts of residual impacts and adaptation limits. Second, a categorisation of research topics in the area of loss and damage should be adopted, with a view to promoting increased terminological consistency in loss-and-damage scholarship.

Table 1: Differentiating features of the drivers of residual impacts

Differentiating features	**Drivers of residual impacts**	
	insufficient or ineffective adaptation	exceedance of adaptation limits
Nature of the negative consequences associated with residual impacts	damages: reversible or irreversible, but reparable	losses: irreversible and irreparable
Suitability of risk-based measures for managing residual impacts	suitable	unsuitable
Large amounts of finance (in the order of billions of USD annually) are needed to manage residual impacts	yes	no
Relevant negotiation streams in international climate-change negotiations	"adaptation" and "loss and damage"	"loss and damage"

2. Methodology

As stated above, the objective of the article is to make the case for separating 'loss' and 'damage' in the context of both science and policy. To achieve this objective, a review of the literature was used.

The documents analysed are those included in a recent review of the loss-and-damage literature (McNamara and Jackson, 2019), which covered 116 articles. In addition, the 21 documents that, on April 30th 2021, were listed in the database Scopus as citing the above-mentioned review were also analysed. Thus, a total of 137 documents were analysed.

The analysis was conducted on Atlas.ti 8, a qualitative data analysis software. A combination of both deductive and inductive coding categories was used (Saldaña, 2021). Deductive coding categories included explicit definitions of 'loss', 'damage' or 'loss and damage'. Inductive coding categories included arguments that connected any of these three terms with either of the following concepts: 'limits to adaptation', 'residual impacts', 'avoided impacts' and 'risk'.

The coded text was divided into three groups, based on whether 'loss', 'damage' or 'loss and damage' was characterised in any distinct manner, even if it was by opposition. Within each group, connections between arguments, notably the four concepts that defined the inductive coding categories, were established. These connections underpin the points made in the following section.

3. Results and discussion

Scholarship on loss and damage stretches back to 2010 (McNamara and Jackson, 2019). Over this period, relatively few scientific articles have been published that offer elements for a definition of loss and damage (Ibid). Warner and van der Geest (2013) define loss and damage as a single concept, as do Roberts and Huq (2015). These definitions put the emphasis on characterising loss and damage as a phenomenon that is distinct from climate-change adaptation.

Central to these definitions is the difference between avoided impacts and residual impacts, in that adaption is concerned exclusively with the former. In the literature, a risk-management paradigm has been proposed to tell when avoided impacts give way to residual impacts (Dow et al., 2013). This paradigm distinguishes between three progressively higher levels of risk, where the highest level entails risks that "fundamentally threaten a private or social norm […] despite adaptive action having been taken" (Ibid, p.305). According to such view, this risk level, referred to as 'intolerable risks', characterises residual impacts. In practice, establishing when 'a private or social norm' is threatened has to be done on a case-by-case basis, because adaptation is socially determined (Adger et al., 2009), and thus varies across communities and even across individuals.

It was only in 2017 that the first attempts at providing separate definitions – one for loss and one for damage – were made. In an effort to underscore the importance of the social factors that determine loss, Lusk (2017) contends that damages are reparable, whereas losses are irreparable. In contrast, Page and Heyward (2017) argue that the difference between losses and damages lies in the extent to which one's ends cannot be achieved, irrespective of the time horizon considered, and even if the means to reach those ends are changed (when changing them is possible). Ethics, namely the injustice associated with being irreversibly deprived from something one values, is at the heart of both definitions of 'loss'.

Building on earlier work (Dow et al., 2013; Barnett et al., 2016), a third article (Tschakert et al., 2017), also published in 2017, constitutes the first attempt at characterising loss through concepts such as 'limits to adaptation' and 'residual impacts'. Arguably, the appeal of doing so lies in the fact that such concepts are well-established in the literature. However, the article makes no reference to damages, as they are irrelevant to the article's primary goal.

Filling this research gap, this article characterises 'losses' and 'damages' as a function of residual climate-change impacts, and outlines the policy and research implications of these characterisations. The latter is achieved by exploring the evidence related to the costs of 'loss' and 'damage', the key issues with regard to managing 'loss', and the steps that may have to be taken to separate 'loss' and 'damage'.

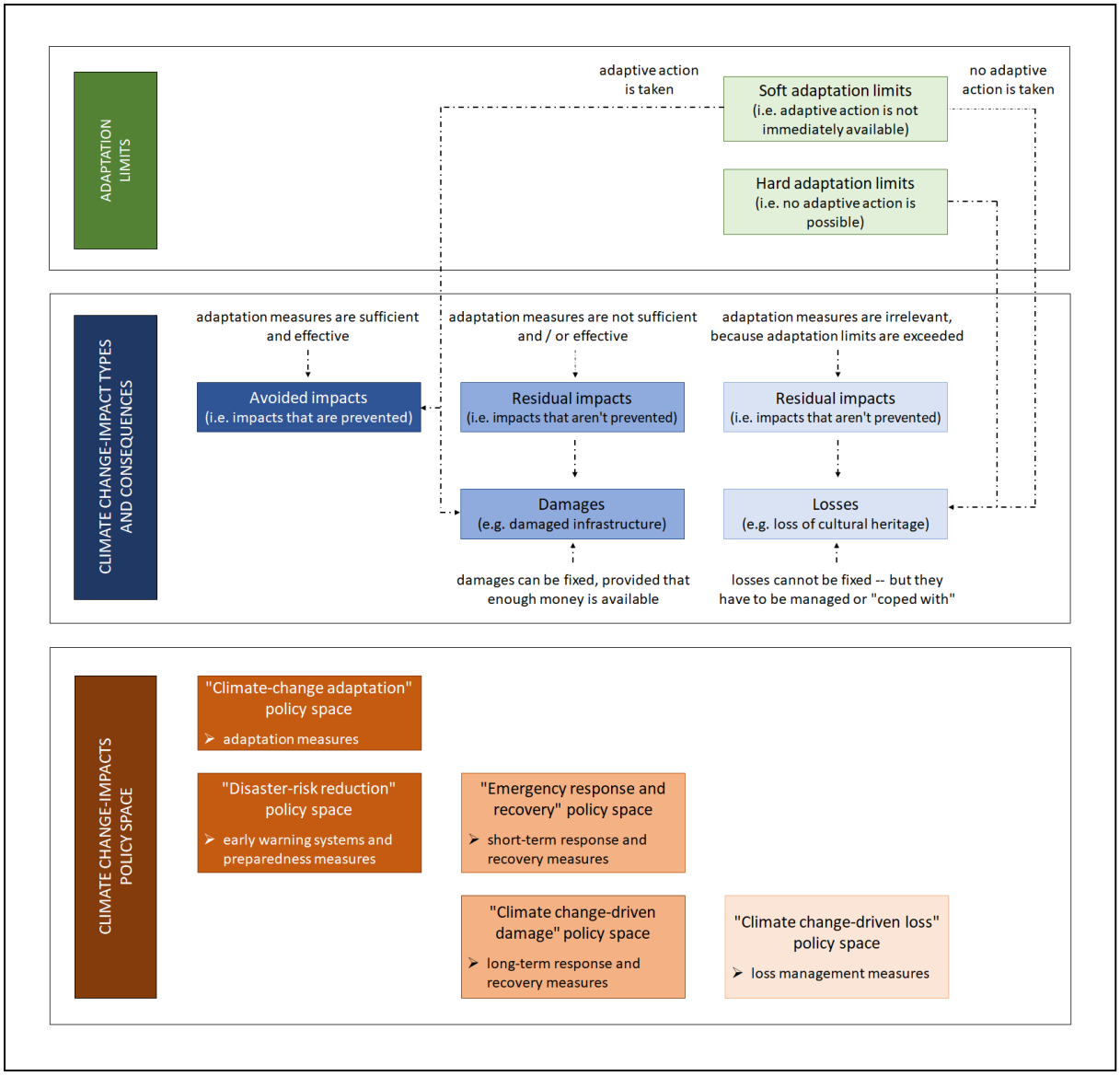
3.1 Characterizing "loss" and "damage"

Residual impacts that occur because adaptation measures are insufficient or ineffective bring about damages, namely harm that is reparable, such as damaged property or reduced crop yields (Figure 1). This class of residual impacts is characterised by three issues. First, for modest damages, responses to loss and damage become conflated with adaptation measures, because adaptation measures, to a greater or lesser extent, are reactive, prompted by some initial (un-avoided and, therefore, residual) impact. Second, economic costs would reach several hundred billion US dollars annually (Gewirtzman et al., 2018). Disagreement over whose responsibility it is to raise such amounts of funding continues to colour many aspects of intergovernmental negotiations about loss and damage. Third, management approaches are well-known, and revolve around comprehensive risk-management measures, coupled with international financial support (Mechler and Schinko, 2016).

Residual impacts that occur because the limits to adaptation have been exceeded bring about losses, namely harm that is irreparable, such as the loss of cultural heritage, biodiversity or human lives (Figure 1). Three issues, akin to those outlined in the previous paragraph, characterise this class of residual impacts. First, whether or not a given type of residual impact exceeds the limits to adaptation may vary from case to case, because the limits to adaptation are contingent upon values (Adger et al., 2009), and what is valued changes across communities and even individuals. Nonetheless, in the context of residual impacts that affect universal values, notably human life, there is little or no ambiguity about the limits to adaptation. Second, economic costs are largely inconsequential (Preston, 2017). What is more, it has been argued that compensation payments may have the perverse effect of normalising loss (Wrathall et al., 2015). Third, although management approaches are only

beginning to be developed, it is clear that risk-based measures are unsuitable (Barnett et al., 2016).

Figure 1: Climate change-impact types, consequences, and "policy spaces"



3.2 Cost of "loss" and "damage"

As mentioned above, the costs associated with damages reach several hundred billion US dollars annually whereas, when it comes to losses, costs are inconsequential. Both statements deserve comment.

Notwithstanding uncertainties and data gaps, the scientific literature reports estimates of the cost associated with damages (Gewirtzman et al., 2018). The order of magnitude of these estimates (several hundred billion US dollars annually) coincides with that of more recent estimates drawn from the grey literature (Perry, 2020). In light of this, and notwithstanding future updates of these estimates, it seems evident that cost is a most fundamental issue when it comes to damages.

In contrast, there is a paucity of estimates of the costs associated with losses, even though several studies of climate change-driven loss have been published. For example, Tschakert et al. (2017) conducted a large review, covering all types of losses and all world regions; McNamara et al. (2021) conducted a region-specific review, focused on Pacific Islands; and Pearson et al. (2021) conducted an issue-specific review, focused on indigenous and local knowledge, and cultural heritage.

Finance does not feature in any of these reviews. Finance does not feature in studies of individual cases either. For example, reporting on aboriginal art lost to climate change-driven floods in Australia, Rigby et al. (2011) outline measures taken to manage loss, none of which relates to finance. The same is true for studies focused on climate change-driven loss of forests in Alaska (Oakes et al. 2016), loss of marine biodiversity in Australia (Marshall et al., 2019), and loss of winter traditions in a Nordic city (Bremer et al., 2020), to cite a few of the studies that go into more depth with regard to how to manage loss.

To be sure, costs are incurred when dealing with loss. For example, a seminal study by DeSilvey (2012) sketches the possible types of costs associated with the loss of a coastal-heritage site in the south of England. A dual lesson can be drawn from this example. First, in the case of losses, and compared to damages, cost levels are likely to be lower by several orders of magnitude, simply because of the nature of the types of costs concerned. Second, from a climate-justice viewpoint, the injustice implicit in the occurrence of loss makes cost an inconsequential element of the debate.

3.3 Managing “loss”

As mentioned above, management approaches for climate change-driven loss are only beginning to be worked out. The nature and state of development of these approaches are sketched in the following paragraphs, to illustrate the wide array of research topics associated with climate change-driven loss, and underscore how different they are from the topics associated with climate change-driven damage.

Whereas the ‘damages’ agenda is dominated by debates of a political nature, centred on disagreements over funding responsibilities, the ‘loss’ agenda is dominated by the large prevailing research gaps in this area. Indeed, although much progress has been made in characterising loss (Tschakert et al., 2019), research still has a long way to go to understand how to prevent or at least delay loss, when this is possible, and how to manage loss, when loss occurs.

With regard to understanding how to prevent or delay loss, scholarship on soft adaptation limits (Mechler et al., 2020) points toward two types of adaptation barriers, depending on whether or not they can be acted upon. Cultural (Tschakert et al., 2017) and psycho-social (Evans et al., 2016) barriers cannot be acted upon, because they constitute intrinsic components of an individual’s identity and a community’s dynamics (Serdeczny et al. 2018). Conversely, institutional barriers (Barnett et al., 2015) can be acted upon, as they entail familiar determinants of institutional action (Munck af Rosenschöld et al., 2014), namely cost, uncertainty, power dynamics, legitimacy, and path dependence.1 Seminal work in historical sociology (Mahoney, 2000) combines power dynamics, legitimacy and path dependence, and suggests mechanisms through which the related institutional barriers can be

broken down. Unfortunately, this work is yet to be applied in the context of climate change-driven loss.

With regard to understanding how to manage loss, few approaches have been identified thus far. Human-geography methods developed in the context of built cultural heritage (DeSilvey and Harrison, 2020) may be applicable to other types of material-heritage losses. Similarly, mental-health methods developed in the context of (anticipated or actual) ecological losses (Cunsolo and Ellis, 2018) may be applicable in areas such as loss of human mobility and loss of territory. Nevertheless, research on approaches to manage loss is still in its early phases.

3.4 Separating "loss" and "damage"

Separating 'loss' from 'damage' would require that parties to the United Nations Framework Convention on Climate Change reach a common view on the scope of negotiations about loss and damage, ideally by adopting a commonly agreed definition of what 'loss and damage' involves. So far, intergovernmental negotiations about loss and damage have progressed without such a definition and, as a result, the discussions have been characterised by a degree of ambiguity. Although this ambiguity has paved the way for agreement on certain matters (Boyd et al., 2017), it has also opened up the negotiations to an overly diverse set of perspectives, some of which exclude the notion of 'loss'.2 It is therefore regrettable that the current programme of work of the Warsaw International Mechanism for loss and damage, which provides the institutional framework for international negotiations on this topic, does not contemplate reaching consensus on a definition of loss and damage.

Against this background, research should lead the way by adopting an unambiguous definition – one that fully accounts for the diversity across issues referred to above. It is argued here that a definition of loss and damage would be best articulated around the concept of residual impacts, and should be structured around two separate elements: a definition of losses, underpinned by the notion of adaptation limits, and a definition of damages, underpinned by the notions of insufficient and ineffective adaptation. Separating both concepts may help reduce ambiguities in loss-and-damage research, by forcing researchers to focus on either concept – or both, if relevant, but then explicitly.

Building on such definitions, the research community could develop a categorisation of research topics in the area of loss and damage, akin to the International Classification of Diseases, a seven-character alphanumeric coding system used in human-health research (WHO, 2018). Such a categorisation could help strengthen the terminological consistency of loss-and-damage scholarship. Figure 2 provides a first attempt at developing such categorisation. The topics included are those covered in a recent review of the literature on loss and damage (McNamara and Jackson, 2019), with more or less sub-classes under each class depending on the depth of the literature within a given class.

In all likelihood, a report on loss and damage under the umbrella of the Intergovernmental Panel on Climate Change would pave the way for the research community to develop a consensus definition of loss and damage, while helping increase terminological consistency. At the moment, and for the foreseeable future, such a report is not on the cards. Nevertheless, nothing prevents the research community from organising a transparent and inclusive process through which the same sort of output – namely, a comprehensive and neutral assessment of

the peer-reviewed literature on loss and damage – is produced. Arguably, such a report would both strengthen research on, and support more effective policy for, 'losses' and 'damages' alike.

Figure 2: A tentative categorization of research topics in the area of loss and damage

A. Damages
  - A.1 Affected systems
    - A.1.1 physical systems
    - A.1.2 biological systems
    - A.1.3 managed systems (mainly, forests, agricultural lands and fisheries)
    - A.1.4 human systems
  - A.2 Policy response
    - A.2.1 risk-based measures
    - A.2.2 pay-outs
    - A.2.3 other

B. Limits to adaptation
  - B.1 Types of limits
    - B.1.1 soft limits
    - B.1.2 hard limits
  - B.2 Determinants of soft adaptation limits
    - B.2.1 psycho-social
    - B.2.2 cultural
    - B.2.3 institutional
    - B.2.4 other

C. Losses
  - C.1 Types of losses
    - C.1.1 human mobility and territory
    - C.1.2 cultural heritage and indigenous knowledge
    - C.1.3 human life and health
    - C.1.4 biodiversity and ecosystem services
    - C.1.5 sense of place and spatial cohesion
  - C.2 Loss-management approaches
    - C.2.1 anticipatory history
    - C.2.2 ecological grief
    - C.2.3 other

D. Finance
  - D.1 Domestic
  - D.2 Bilateral or multilateral
  - D.3 Other

E. Attribution
  - E.1 Attribution science
  - E.2 Policy implications
  - E.3 Other

Figure 2: A tentative categorization of research topics in the area of loss and damage (continued)

F. Policy
  - F.1 Inter-governmental negotiations
    - F.1.1 Warsaw International Mechanism
    - F.1.2 Paris Agreement
    - F.1.3 other
  - F.2 National policy
  - F.3 Other

G. Climate justice
  - G.1 Fair remedy
  - G.2 Compensatory justice
  - G.3 Other

H. Research on loss and damage
  - H.1 Research methods
  - H.2 Epistemologies
  - H.3 Other

I. Other

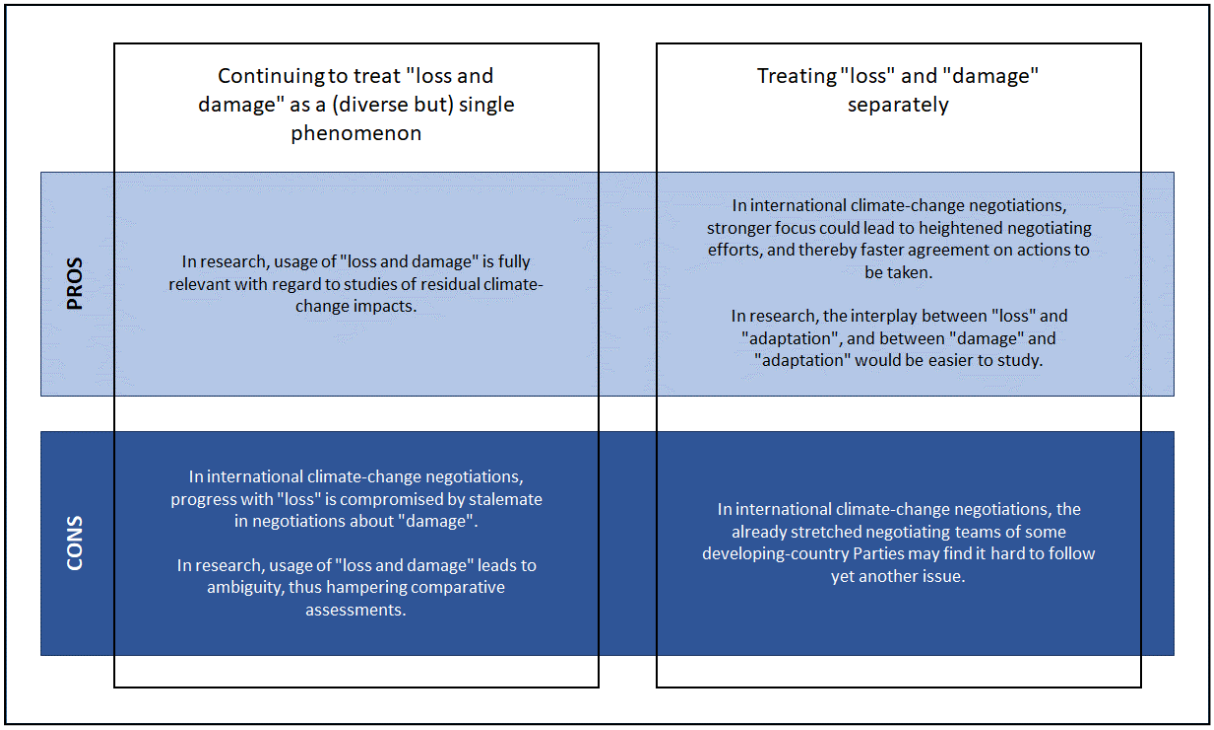
4. Conclusions

In sum, 'loss and damage' encompasses two very different sets of issues. The top priorities associated with each of them are equally disparate: respectively, mobilising the funding required to manage damages; and understanding how to prevent or delay loss, when this is possible, and how to manage loss, when loss occurs.

Such diversity across issues and priorities suggests that, in the context of international climate-change negotiations, the case for continuing to bundle together 'loss' and 'damage' is weak. First, from the point of view of the specific issues concerned, in many instances there is more overlap between damages and adaptation, than between damages and losses. Second, given the comparatively much larger amounts of funding required to manage damages, the negotiating stakes associated with damages are much higher than those associated with losses. Stated differently, disagreement over whose responsibility it is to raise the funding required to manage damages holds back progress on every other aspect of the loss-and-damage debate, not least of all with regard to losses.3

Arguably, then, separating 'loss' from 'damage' would not hamper negotiations related to 'damage', and would most likely facilitate progress with negotiations about 'loss' (Figure 3). Specifically, it may help step up efforts with regard to the two issues highlighted above: understanding how to prevent loss or delay loss, and how to manage loss.

Figure 3: Pros and cons of treating “loss” and “damage” separately versus not doing so



Notes

1 Path dependence refers to the tendency exhibited by institutions to perpetuate structural properties or beliefs and values, even when doing so fails to continue to serve the public-policy goal that the institutions were intended to serve in the first place.

2 Indeed, some perspectives effectively exclude residual impacts that exceed adaptation limits.

3 Indeed, in intergovernmental negotiations about loss and damage, most contentious points concern aspects related to “damages”, notably financing, as documented by the International Institute for Sustainable Development’s summaries of the negotiating sessions, which are published after each session. Not least, the agenda of these sessions is dominated by issues related to “damages”, because of the comparatively higher political stakes, again driven by discrepancies over finance, thereby neglecting issues related to losses, which are substantially different, as highlighted in the scientific literature (Barnett *et al.*, 2016). Thus, it seems sensible to assume that issues related to “losses” would benefit from having their own, separate negotiating space.

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