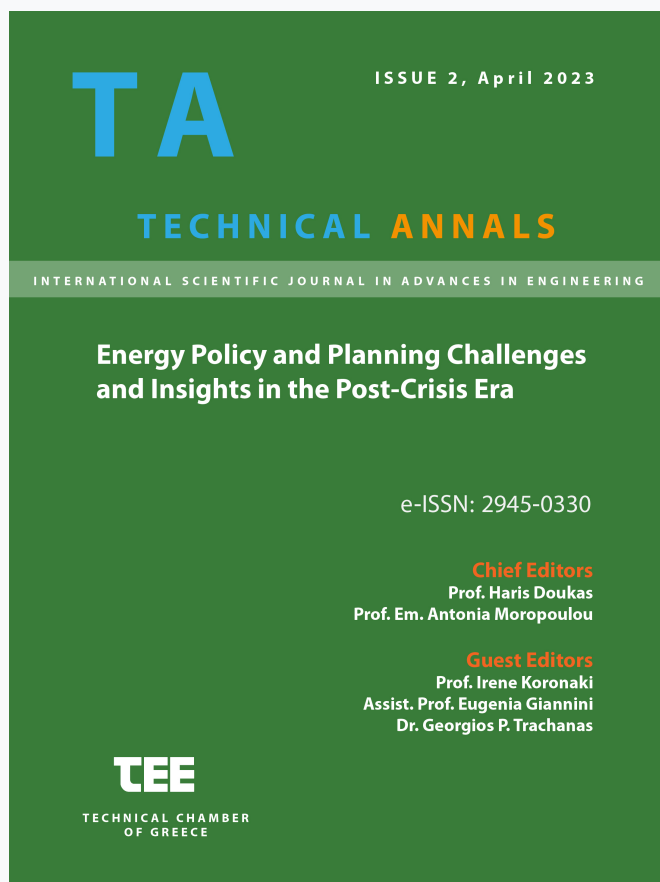


Technical Annals

Vol 1, No 2 (2023)

Technical Annals



The Importance of “Loss and Damage” in Supporting Climate Policy Debate

Ioannis Tsipouridis, Ngetich E. Kiprotich, Anita Jerotich Chebii, Nektarios Matsagkos, Georgios P. Trachanas

doi: [10.12681/ta.34133](https://doi.org/10.12681/ta.34133)

Copyright © 2023, Georgios P. Trachanas, Ioannis Tsipouridis, Emmanuel Ngetich, Anita Jerotich Chebii, Nektarios Matsagkos



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/).

To cite this article:

Tsipouridis, I., E. Kiprotich, N., Chebii, A. J., Matsagkos, N., & Trachanas, G. P. (2023). The Importance of “Loss and Damage” in Supporting Climate Policy Debate. *Technical Annals*, 1(2). <https://doi.org/10.12681/ta.34133>

The Importance of “Loss and Damage” in Supporting Climate Policy Debate

Ioannis Tsipouridis¹, Ngetich E. Kiprotich², Anita Jerotich Chebii³, Nektarios Matsagkos⁴[0000-0002-8119-8033], and Georgios P. Trachanas⁴[0000-0003-2978-8252]

¹Renewable Energy and Climate Change Research Center,
Technical University of Mombasa, Kenya

²Africa Center of Excellence in Energy for Sustainable Development,
University of Rwanda, Rwanda

³Serengeti Energy, Nairobi, Kenya

⁴Decision Support Systems Laboratory, School of Electrical & Computer Engineering,
National Technical University of Athens, Greece
anemologia@gmail.com, tooemmanuel6@gmail.com,
anita012.ac@gmail.com, nmatsagkos@epu.ntua.gr,
gtrachanas@epu.ntua.gr

Abstract. Undoubtedly, climate change has profound impacts on human and natural systems. In recent years, there has been a growing recognition of the need to address the Loss and Damage issue, which is associated with the adverse effects of climate change, particularly in the developing countries which are more vulnerable to its impacts. In this context, there is a wide range of studies examining the concepts, resilience, adaptation and policy options for dealing with climate change losses and damages. In this spirit, the present paper discusses actions, research and financial needs, as well as some adaptation, stakeholder engagement, governance and risk transfer issues related to Loss and Damage.

Keywords: Loss, Damage, Climate, Impact, Policy

1 Introduction

Climate change is one of the greatest challenges the world faces today, with far-reaching impacts on human and natural systems [1]. A major impact of climate change - mainly caused by the emissions of developed countries - is that developing and least developing countries are facing much more effects, thus making them more vulnerable to climate change associated disasters such as flash floods, heat waves, droughts, depleted reservoirs, forest burns etc. [2]. This is where the concept of Loss and Damage (L&D) arises, which refers to the negative impacts of climate change that occur despite, or in the absence of, mitigation and adaptation [3]. In this context, at the United Nations Climate Change Conference (COP26) in Glasgow [4], activists and representatives from the most affected developing nations demanded compensation from developed countries for the losses and damages that can be directly linked to their emissions levels which can't be stopped through previous mitigation strategies. They aimed at providing

political space to discuss the credibility of support for loss and damage, and securing meaningful outcomes for COP27, and also paved the way for rebuilding trust between developed and developing countries [5].

The debate on L&D has gained traction over the last years and is continuously supported by growing scientific and empirical evidence on exploring the effects of climate related hazards and their impacts [6]. Especially, the notion of disproportionate impacts on certain communities and regions has long been a part of policy debates and the policy agenda in the international negotiations on climate change. Yet, disproportionality remains relatively undefined and implicit regarding L&D [7]. Disproportionality is a central and contentious issue within the international negotiations on climate change. It is instrumental regarding the emergence of L&D as a concept and political debate issue in global policy processes, which aim at addressing the losses and damages that are associated with the impacts of climate change. A coherent theoretical basis of disproportionality is necessary towards advancing science and policy on L&D. In this context, some critical questions need to be asked before delving into the L&D policy debate: what is disproportionate, to whom, and in relation to what?

The L&D debate encompasses a broad range of topics, including research, action, finance, and methodological approaches. Current research pathways seek to understand the nature and extent of L&D impacts and identify effective ways to address them. Action on L&D involves implementing measures to reduce the impacts of climate change and support the affected communities. Financing L&D is also critical as it requires significant resources to address the impacts of climate change on vulnerable communities. Approaches to L&D include adaptation, stakeholder engagement, governance, and risk transfer, among others. Current approaches aim to address L&D issues through various means including, among others, resilience enhancement, capacity building, community-based initiatives support, improvement of information access, and financial assistance provision.

At COP27 conference, a breakthrough agreement was reached to establish a new L&D fund in order to help vulnerable countries to cope with the devastating impacts of climate change. This fund is going to provide financial assistance to countries that suffer from climate related losses and damages, such as extreme weather events, sea levels rise, and other climate induced disasters. The agreement recognizes the urgent need to address the issue of loss and damage, particularly for countries that have least contributed to the problem. The fund is expected to start operating from 2024, and it is hoped that will help to mitigate the worse impacts of climate change on vulnerable communities and support their adaptation efforts [8]. The present study aims to provide a comprehensive overview of the L&D discourse by highlighting the current state of research and action on L&D, as well as the financing needs and approaches to address it. By examining these topics, this paper seeks to shed light on the challenges and opportunities that lie ahead in addressing this critical issue.

The rest of the paper is organized as follows: In Section 2, there is a brief history of L&D issue. In Section 3, approaches to cope with L&D are discussed, while, in Section 4, responses to L&D are presented. Finally, in Section 5, the things that need to be done are discussed, while in Section 6 conclusions are drawn.

2 Historical Overview

Climate related impacts, in their various forms, will increasingly affect livelihoods. The discussion on how to best address the permanent and irreversible impacts of climate change has been a subject of consideration in the climate regime since its very beginning. The concept of "Loss and Damage" and its connection to insurance tools and approaches has been traced back to a suggestion put forward by the Alliance of Small Island States (AOSIS) in 1991 during the negotiations of the United Nations Framework Convention on Climate Change (UNFCCC) [9]. AOSIS, a recently formed coalition of small island nations, proposed the creation of an international insurance pool as a means of collectively sharing losses and compensating the most vulnerable small islands and low-lying coastal developing countries for the damages they experience [7]. The idea of insurance was raised again at COP7, which held in Marrakesh in 2001 [10], and at the discussion took off in 2007/2008 [11], where a mechanism to address L&D was proposed, consisting of three interdependent tracks: an insurance element, to help vulnerable developing countries manage financial risk from increasingly frequent and severe extreme weather events; a rehabilitation and compensation part, to address the progressive negative impacts of climate change such as sea level rise and increasing land and sea surface temperatures; and a risk management component [12]. The global community acknowledged in 2013, through the implementation of the Warsaw International Mechanism [13], that human-induced climate change will cause a variety of negative consequences, even with efforts to lessen its impact and prepare for it. At COP21, that was held in Paris [14], loss and damage was included in article 8 of the Paris Agreement, in a stand-alone article that was separate from adaptation. L&D, associated with climate change, has emerged as one of the most important issues needing urgent attention both at local and national levels for a number of reasons [15]. Important factors related to L&D are the barriers towards reducing the greenhouse gas (GHG) emissions, as well as the limitations in scaling and the ability to maximize the effective adaptation.

L&D plays an increasingly larger role in the international climate change negotiations and in the national level climate change policies, as has been evidenced both by the prominence recorded in the Glasgow Climate Pact and the growing number of references in Nationally Determined Contributions (NDCs). To align L&D policy with mitigation measures, various researchers, as well as policy makers, of the Global South focus on liability and compensation mechanisms. Yet, countries in the Global North have considered L&D as a red line, while the UNFCCC had ruled out any avenue for liability and compensation [9]. Under these circumstances, its ambiguous nature will continue to make difficult the finding of a solution that works well for both sides.

3 Loss and Damage and Related Approaches

Most of the existing literature has focused on loss and damage that has already occurred, in the sense that there are already on-the-ground impacts from climate hazards [9, 16, 17, 18]. The first studies on loss and damage, related to climate change, appeared

in the last decade, while there is a plethora of studies coming from other disciplines such as disaster mitigation and risk management. Especially, in the context of climate change policy, there has been a significant increase in studies by 2013. From the outset, this plethora appears to be quite motivational, given the absence of studies (particularly those that are based on empirical research) to support the international policy debate. In this particular context, there are four primary categories of evidence used for weather attribution, as discussed in [9, 48]. These categories include: (1) physical reasoning, which involves examining whether a weather event aligns with climate trends; (2) statistical analysis, which assesses if an extreme weather event falls outside the range of what would be expected in a climate unaffected by external influences; (3) fractional attributable risk, which utilises climate models to compare the likelihood of a specific event occurring with and without climate change forcing; and (4) a more philosophical approach that argues that, since climate change is an established scientific reality, all climatic phenomena are influenced by climate change. Most empirical case studies tend to adopt either the first or the last approach, implying that climate change is acknowledged and, consequently, all extreme events should be considered as instances of climate change-related loss and damage.

Regarding vulnerability, its presence is not only a result of visible formal governance mechanisms but also due to informal and invisible governance processes that shape daily life in many of the places disproportionately affected by extreme and slow-onset events. While climate change is a current and unfolding reality, it is important to consider and portray these vulnerability processes within a historical socio-political framework, as they can materialise as L&D in the affected communities [19].

Climate change has been labelled as a human rights challenge of the twenty-first century and, in particular, L&D resulting from climate change poses a severe threat to the human rights of the affected communities. Human rights laws and approaches have potential to provide remedies in the field of climate change where other areas of the law do not apply. This concept has been broadly acknowledged in literature by [20]. Human rights protection approaches could empower victims as participants in the decision making process that concerns their lives and livelihoods and promotes cooperation between states and those that are most affected [21]. In this context, L&D can be operationalized when human rights guidelines for loss and damage policies and actions, as well as for conducting impacts assessments, can be developed, and a specialised body to monitor the compliance can be set up.

L&D has been conceptualised as a development crisis issue in order to emphasise the importance of taking a broader societal approach to climate change[22]. Until now, climate change has predominantly been an environmental problem, often neglecting the social, political, cultural and ethical dimensions of the issue [23]. By conceptualising climate change as a development crisis issue, opportunities for transformation to address the root causes of L&D are more likely to emerge. Transformation as liberation offers the widest range of policy opportunities for the broader policy framework of L&D to meet the goals of equitable and sustainable development. It also offers a set of potential factors and recommendations to help transform policy into practice, as well as to highlight the role of global processes in facilitating it.

While L&D is often associated to social approaches, it is important to recognise the critical role that science must play in addressing the challenges posed by climate change. Rather than simply focusing on compensation, L&D should prioritise the capacity building to manage risk. A thorough understanding of the root cause of L&D is necessary to establish a strong foundation for the ongoing negotiations. On the other hand, models used by climate scientists to estimate the probability of extreme weather events, resulting from anthropogenic climate change, can be very challenging due to their limitations and inability to simulate accurately such events [24]. Therefore, it is important to invest in scientific research and development to improve the accuracy of these models and better understand the complex interactions between human activity and the climate system. By doing so, the ability to mitigate the impacts of climate change and build more resilient communities will be enhanced.

4 Response to Loss and Damage

4.1 Governance

L&D governance consists of national risk management strategies, approaches, and tools, as well as formal policy mechanisms that address the residual effects of human-caused climate change, given that mitigation and adaptation efforts have failed. However, current global level policy mechanisms lack the jurisdiction to provide comprehensive L&D governance [19]. As a result, effective L&D governance is primarily embedded into national and international disaster recovery and risk management mechanisms.

Energy and climate policies, along with the production and growth model, depict the path that national economies follow against climate change. Sustainable development could indeed enhance mitigating loss and damage due to its ex-ante treatment of the problems. Of course, in developed countries, L&D is generally situated within the adaptation and disaster management approaches [25, 26, 27]. On the other hand, developing countries focus mainly on “beyond-adaptation” impacts [28, 29, 30].

4.2 Risk Transfer

As mentioned in [9], individuals typically prioritise insurance coverage for potential catastrophic events that could affect them or their property, often without any fault of their own. In this scenario, it may seem reasonable to expect countries in the Global South to pay insurance premiums for climate change impacts that they have not significantly contributed to. Setting temporarily aside any arguments about causation, when disasters occur beyond the capacity of national governments to handle, the international community often provides technical and financial assistance for the response. One potential solution could be to encourage all countries to contribute to an insurance pool, while recognising the principle of common, but differentiated, responsibility among individual states. This means that countries at greater risk, but with less financial capability, should contribute proportionally less, compared to countries at lower risk, but with greater financial capacity.

Numerous developed countries have supported risk mitigation and risk transfer strategies. For instance, US submissions frequently emphasise at risk mitigation and connect it to the requirement that a L&D policy needs also be considered as part of a continuous adaptation strategy [31]. Nonetheless, several parties have expressed trepidation regarding insurance solutions to L&D.

4.3 Adaptation and Coping

The policy remit of L&D, as well as its distinction from adaptation policy and practice, have been hotly debated, primarily along with two lines of inquiry: What should we think about? Only the impacts of today and future? Or both, along with the scope and the potential to avoid risks? Given the unpredictable and ever-changing nature of the global climate, adaptation will always be challenging. Research on the impacts of droughts from study sites in four African and Asian countries, that were surveyed in vulnerable communities, revealed that vulnerable households used a more diverse portfolio of coping measures [32]. Coping strategies are short-term responses to the impacts of sudden or unusual events. By contrast, adaptation refers to long-term adjustments to more permanent changes in the climate [33]. Beyond coping and adaptation, a third type of response involves the preventive measures (risk reduction) that households adopt in response to normal characteristics (including variability) of the climate and environment and the anticipation regarding unusual events [34].

The lack of technical and scientific information, and the capacity to use it at the local level is one of the most important barriers to adaptation [15]. This is why decision makers need to assess adaptation options in the context of climate change effects on the local community and infrastructure [35]. Therefore, engaging local stakeholders in discussions constitutes a challenge for policy makers.

The process of adaptation at various spatial and societal scales, and the achievement of long-term sustainability must be evaluated based on distinct criteria at these respective levels [36]. Moreover, concepts such as efficacy, efficiency, fairness, and validity are quite crucial in this context, but the degree of importance assigned to each criterion is not predetermined, but rather it arises from the consent and the actions of the societal processes. The degree of accomplishment depends crucially on the ability to adapt and the allocation of that ability. The importance of the criteria for success is debated and will vary over time [35].

4.4 Stakeholder Engagement

Stakeholders that are engaged in L&D issues have a clear, but diverse, understanding of its definition and how it could be mitigated. While there appears to be some agreement on L&D defined as the residual losses and damages after implementing actions, other stakeholders mention the need to apply more broadly based engagements, with L&D providing the impetus for stronger mitigation and adaptation outcomes. In order to mitigate, prevent, and remedy L&D, conversations regarding climate change risk and adaptation necessitate a focus on tackling the fundamental causes of vulnerability [19]. Climate change issues are being addressed through national and international level structured efforts. These are influenced by various stakeholders and hence their

opinions impact the importance of issues under consideration [15]. International cooperation, in general, has not been proved very successful, especially when it comes to the issue of global commons, due to the conflict and asymmetry between countries that bear the cost of action and those who benefit from it [35].

5 What Needs to Be Done?

While L&D is a major and topical issue that concerns the world, yet there is lack of knowledge on national-level financing and effective mechanisms for managing it. Concerning actions, it is crucial to enhance support and capacity building, focusing especially on addressing L&D associated with the adverse effects of climate change. This will strengthen dialogue, coordination, coherence and synergies among relevant stakeholders. Although climate adaptation has been strengthened in the Paris Agreement, climate-related risks may exceed adaptation possibilities for communities and countries [36, 37]. Finding a framework that will be adopted by all parties is essential for the L&D negotiations.

The necessity to implement actions in various disciplines constitutes research as a critical catalyst. All related scientific fields are constantly met up in new developments, technologies, geopolitical interests and climate data. Study [38] provides a historical overview of the emergence and evolution of the concept of L&D within the UNFCCC, and analyses the different frames and discourses used by various agents in order to shape the debate around this issue. They argue that the framing of loss and damage, as a legal and political issue, has significant implications for the negotiations and the actions taken to address the impacts of climate change. Emphasis is placed on topics such as adaptation, policy and governance, but, as pointed out in [2], anthropogenic climate change is going to engage further the global community.

Regarding especially the adaptation, resilience should be viewed as a dynamic process rather than a static condition [39]. Regional differentiation is important for assessing both future climate risks and the different vulnerabilities of communities to incremental increases in global mean temperature [40]. In this context, the following three concerns are listed in [41]: (a) scale, interconnectedness and speed of climate change, which are believed to create a limited window for action on adaptation, (b) adaptive capacity will not necessarily be translated into actual adaptation, with multiple barriers potentially impeding adaptations across sectors and scales, and (c) the extent to which actions already in place are not sustainable, with maladaptation predicted to abound in multiple sectors.

Regarding policy and governance, a review on politics and how they have been understood within the realm of international L&D governance is provided in [42]. In addition, the policy space for addressing L&D is examined in [37], referring to the residual impacts that occur despite the adaptation and mitigation efforts, arguing that policy approaches must be tailored to address specific types of loss and damage, as well as the needs of vulnerable populations. Last, but not least, concepts, metrics and the governance of L&D, from four sustainable development perspectives, are examined in [43]: (a) Weak Sustainability, (b) Critical Capital Sustainability, (c) Wish List and (d) Human

development. Moreover, the idea that sustainable development provides a coherent, comprehensive, and integrative framework for the further development of L&D scholarship and that human development is the most advanced perspective on sustainable development is also supported. Finally, progressive research should include both empirical and theoretical explorations of the potential for transformation, while understanding what people value and how they can engage with loss and damage [44]. This should not be skipped in order to ensure that the perspectives of the most vulnerable groups are indeed included in the decision making process, and that greater policy relevant research and critical analyses of L&D conceptualizations are taken into account. Regarding financing for L&D [45], in developing countries where much of the population lives in poverty, extreme weather events can be a devastating blow [46]. Individuals have little savings to rebuild, while governments with few resources struggle to secure the millions of dollars needed to help communities recover from the effects of climate change. Although developing economies are mostly consisted of globally responsible citizens, they are also victims of the polluters, who have caused them to be hit hardest by climate change. While the importance of financing for L&D is agreed, for these vulnerable people who are the most affected by the challenges of climate change, there are divergent views on this, relating to historical responsibility and principles of equity. The types of funds, fair distribution and identification of who should receive financing, given disproportional L&D across nations, are a few of the existing challenges [19]. Undoubtedly, financing for addressing L&D is a way that wealthy countries need to follow. In this direction, industrialised countries need to commit additional funding, which is a quite crucial part of climate justice.

6 Conclusions

In conclusion, we realise that it is urgent for the international community to play a more active role in supporting policy makers to efficiently assess the impacts, as well as the scaling of loss and damage, which is experienced from human-induced climate change in different regions and in different national contexts, over different time frames and at different emission pathways. In this direction, it is crucial to work with stakeholders and decision makers in order to efficiently design and promote strategies that are suited to assisting the most vulnerable against loss and damage.

Since countries have established a fund, the hard work of designing and ultimately filling it has begun. Negotiators have formed a Transitional Committee to develop recommendations, which should be operationalised by COP28, along with the broader framework for funding arrangements, including funds and initiatives inside and outside the UNFCCC [47]. Furthermore, over the next period, countries are going to work on selecting the host organisation, electing members of the Advisory Board, and hiring the secretariat for the Santiago Network.

In 2023, there will be a focus on whether parties adopt a robust framework for the Global Goal on Adaptation and fulfil their financial pledges to the Adaptation Fund, Least Developed Countries Fund, and others. There will also be attention on whether progress is made towards doubling adaptation finance and if adaptation efforts are

scaled up. Additionally, the accessibility of these funds and their reach at the local level will be closely monitored. Developed countries’ commitment to providing \$100 billion annually to developing countries will also be scrutinized, with attention on whether they accelerate their pledges to compensate for previous shortfalls. Negotiations will continue on the details of the new climate finance goal, including the quality of funding, timelines, instruments, sources, and access, with the aim of establishing it in 2024 [47].

Acknowledgments:

This work was supported by the Horizon Europe European Commission Project “IAM COMPACT” under Grant Agreement No. 101056306. The content of this paper does not necessarily reflect the opinions of the European Commission and the responsibility for it lies solely with its authors.

References

1. van de Ven, D. J., Mittal, S., Gambhir, A., Lamboll, R. D., Doukas, H., Giarola, S., ... & Nikas, A.: A multimodel analysis of post-Glasgow climate targets and feasibility challenges. *Nature Climate Change*, 1-9 (2023).
2. Huq S., Roberts E., & Fenton A.: "Loss and damage". *Nature Climate Change* 3(11), 947-949 (2013).
3. World Resources Institute Homepage, <https://www.wri.org/insights/loss-damage-climate-change>, last accessed 2023/04/23.
4. UNFCCC Homepage, <https://unfccc.int/conference/glasgow-climate-change-conference-october-november-2021>, last accessed 2023/04/23.
5. UN Homepage, <https://www.un.org/en/climatechange/adelle-thomas-loss-and-damage>, last accessed 2023/04/23.
6. Mechler, R., Bouwer, L. M., Schinko, T., Surminski, S., & Linnerooth-Bayer, J.: Loss and damage from climate change: Concepts, methods and policy options. Springer Nature (2019).
7. Dorkenoo, K., Scown, M., & Boyd, E.: A critical review of disproportionality in loss and damage from climate change. *Wiley Interdisciplinary Reviews: Climate Change* 13(4), (2022).
8. UNFCCC Homepage, <https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries>, last accessed 2023/04/23.
9. McNamara, K. E., & Jackson, G.: Loss and damage: A review of the literature and directions for future research. *Wiley Interdisciplinary Reviews: Climate Change*, 10(2), (2019).
10. UNFCCC Homepage, <https://unfccc.int/resource/docs/cop7/13a01.pdf>, last accessed 2023/03/29.
11. UNFCCC Homepage, https://unfccc.int/files/kyoto_protocol/application/pdf/aosisinsurance061208.pdf, last accessed 2023/03/30.
12. GERMANWATCH Homepage, <https://www.germanwatch.org/en/loss-damage>, last accessed 2023/03/30.
13. UNFCCC Homepage, <https://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf>, last accessed 2023/03/29.
14. UNFCCC Homepage, <https://unfccc.int/event/cop-21>, last accessed 2023/03/29.

15. IGES Homepage, <https://www.iges.or.jp/en/pub/paris-climate-agreement-and-beyond-linking/en>, last accessed 2023/03/31.
16. Kusters, K., & Wangdi, N.: The costs of adaptation: changes in water availability and farmers' responses in Punakha district, Bhutan. *International Journal of Global Warming* 5(4), 387-399 (2013).
17. Lashley, J. G., & Warner, K.: Evidence of demand for microinsurance for coping and adaptation to weather extremes in the Caribbean. *Climatic Change* 133, 101-112 (2015).
18. Lassa, J. A., Lai, A. Y. H., & Goh, T. : Climate extremes: an observation and projection of its impacts on food production in ASEAN. *Natural Hazards* 84, 19-33 (2016).
19. Boyd, E., Chaffin, B. C., Dorkenoo, K., Jackson, G., Harrington, L., N'guetta, A., ... & Stuart-Smith, R. Loss and damage from climate change: A new climate justice agenda. *One Earth* 4(10), 1365-1370 (2021).
20. Savaresi, A., & Auz, J. Climate change litigation and human rights: pushing the boundaries. *Climate Law* 9(3), 244-262 (2019).
21. Broberg, M., & Sano, H. O. : Strengths and weaknesses in a human rights-based approach to international development—an analysis of a rights-based approach to development assistance based on practical experiences. *The International Journal of Human Rights*, 22(5) 664-680 (2018).
22. Roberts, E., & Pelling, M.: Loss and damage: an opportunity for transformation? *Climate Policy* 20(6), 758-771 (2020).
23. Broberg, M., & Romera, B. M.: Loss and damage after Paris: more bark than bite? *Climate Policy* 20(6), 661-668 (2020).
24. James, R., Otto, F., Parker, H., Boyd, E., Cornforth, R., Mitchell, D., & Allen, M.: Characterizing loss and damage from climate change. *Nature Climate Change* 4(11), 938-939 (2014).
25. UNFCCC Homepage, <https://unfccc.int/sites/default/files/resource/docs/2011/sbi/eng/misc01.pdf>, last accessed 2023/04/25.
26. UNFCCC Homepage, <https://unfccc.int/sites/default/files/resource/docs/2012/sbi/eng/misc14a01.pdf>, last accessed 2023/04/05.
27. UNFCCC Homepage, https://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/norway_22_february_2011.pdf, last accessed 2023/04/05.
28. UNFCCC Homepage, https://unfccc.int/files/adaptation/cancun_adaptation_framework/loss_and_damage/application/pdf/submission_bolivia_for_loss_and_damage_cop_18.pdf, last accessed 2023/04/05.
29. UNFCCC Homepage, https://unfccc.int/files/adaptation/application/pdf/submission_by_the_gambia_on_behalf_of_the_least_developed_countries_on_loss_and_damage.pdf, last accessed 2023/04/05.
30. UNFCCC Homepage, <https://unfccc.int/resource/docs/natc/ghanc3.pdf>, last accessed 2023/04/05.
31. UNFCCC Homepage, https://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/usa_25_february_2011.pdf, last accessed 2023/03/29.
32. Van der Geest, K. & Schindler, M.: Report: Handbook for assessing loss and damage in vulnerable communities. Bonn: United Nations University Institute for Environment and Human Security (2017).
33. Van der Geest, K., & Warner, K.: Vulnerability, coping and loss and damage from climate events. In *Hazards, Risks, and Disasters in Society*. Academic Press, 121-144 (2015).
34. Bauer, K.: Are preventive and coping measures enough to avoid loss and damage from flooding in Udayapur district, Nepal? *International Journal of Global Warming* 5(4), 433-451 (2013).

35. Corfee-Morlot, J., Cochran, I., Hallegatte, S., & Teasdale, P. J.: Multilevel risk governance and urban adaptation policy. *Climatic change* 104(1), 169-197 (2011).
36. Adger, W. N., Arnell, N. W., & Tompkins, E. L.: Successful adaptation to climate change across scales. *Global environmental change* 15(2), 77-86 (2005).
37. Mechler, R., & Schinko, T.: Identifying the policy space for climate loss and damage. *Science* 354(6310), 290-292 (2016).
38. Vanhala, L., & Hestbaek, C.: Framing climate change loss and damage in UNFCCC negotiations. *Global Environmental Politics* 16(4), 111-129 (2016).
39. Tanner, T., Lewis, D., Wrathall, D., Bronen, R., Cradock-Henry, N., Huq, S., ... & Thomalla, F.: Livelihood resilience in the face of climate change. *Nature Climate Change* 5(1), 23-26 (2015).
40. Schleussner, C. F., Lissner, T. K., Fischer, E. M., Wohland, J., Perrette, M., Golly, A., ... & Schaeffer, M.: Differential climate impacts for policy-relevant limits to global warming: the case of 1.5 C and 2 C. *Earth system dynamics* 7(2), 327-351 (2016).
41. Ford, J. D., McDowell, G., & Pearce, T.: The adaptation challenge in the Arctic. *Nature Climate Change* 5(12), 1046-1053 (2015).
42. Calliari, E., Serdeczny, O., & Vanhala, L.: Making sense of the politics in the climate change loss & damage debate. *Global Environmental Change* 64, 102133 (2020).
43. Boda, C. S., Faran, T., Scown, M., Dorkenoo, K., Chaffin, B. C., Nastar, M., & Boyd, E.: Loss and damage from climate change and implicit assumptions of sustainable development. *Climatic Change* 164, 1-18 (2021).
44. van der Geest, K., & Warner, K.: Loss and damage in the IPCC Fifth Assessment Report (Working Group II): a text-mining analysis. *Climate Policy* 20(6), 729-742 (2020).
45. Mechler, R., & Deubelli, T. M.: Finance for loss and damage: a comprehensive risk analytical approach. *Current Opinion in Environmental Sustainability* 50, 185-196. (2021).
46. WYPR Homepage, <https://www.wypr.org/2021-11-11/developing-nations-say-theyre-owed-for-climate-damage-rich-nations-arent-budging>, last accessed 2023/03/29.
47. Ecosystem Marketplace Homepage, <https://www.ecosystemmarketplace.com/articles/cop27-key-takeaways-and-whats-nextwri-blog/>, last accessed 2023/03/29.
48. Hulme, M.: Attributing weather extremes to ‘climate change’ A review. *Progress in Physical Geography* 38(4), 499-511 (2014).