



NAVIGATING THE FINE LINE: DEFINING BOUNDARIES BETWEEN ADAPTATION AND LOSS & DAMAGE IN A CHANGING CLIMATE

PREPARED BY

Indu K Murthy, Samraj Sahay, Ira Feldman, Driss Ouazar, Hikma Bachegour,
Tashina Madappa Cheranda & Riad Balaghi

NOVEMBER 2023

TABLE OF CONTENTS

<i>Executive Summary</i>	2
1. <i>Introduction</i>	3
2. <i>Understanding Adaptation and Loss & Damage</i>	3
2.1. Definition of Loss & Damage	4
3. <i>The Blurred Line Between Adaptation and L&D</i>	5
3.1. Scale	5
3.2. Attribution	5
4. <i>Boundaries and Metrics</i>	6
4.1. Principles for Developing Boundary Metrics	6
4.2. Boundary considerations.....	7
5. <i>Finance</i>	8
6. <i>Conclusion</i>	9
7. <i>References</i>	9
8. <i>Acknowledgements:</i>	10

EXECUTIVE SUMMARY

As climate change impacts intensify, delineating between proactive adaptation and grappling with escalating irrecoverable losses has become pivotal yet ever more blurred. Adaptation involves planned investments to manage projected risks, while Loss and Damage (L&D) contends with uncontrolled consequences breaching adaptation limits. However, real-world complexities confuse clear categorical divisions. Losses emerge from cyclones and heatwaves requiring simultaneous adaptation resourcing and compensation for irrecoverable damages. Scale differences add further intricacy - adaptation tackling community risks versus L&D responding to existential threats like island nations permanently disappearing.

Despite two decades strengthening conceptual understanding, universal agreement on constitutive characteristics demarcating where adaptation ends and irrecoverable L&D begins remains lacking. Principles like equity, inclusiveness and transparency can steer systematic boundary assessment, shaping resource allocation priorities. But with climate impacts accelerating, determining quantitative metrics quantifying adaptation constraints has assumed acute urgency.

Ethical and financial considerations are key drivers necessitating delineation. Adaptation utilizes planned, predictable resources for managing projected risks, integrable into regular budgets. Addressing escalating losses as adaptation limits are exceeded requires responsive funding covering more than just economic impacts. However, over-reliance on insurance overlooks non-economic cultural losses. Hence disaster mechanisms tackling multifaceted human values require greater emphasis.

Quantifying hard adaptation constraints through contextual metrics helps partition dedicated resources and inform “polluter pays” considerations. Indicators tracking exposure thresholds, non-economic values at risk and incremental costs calibrate L&D preparedness. Ex-ante metrics also enable scenarios projecting future adaptation boundaries across places and systems. Going beyond purely aggregate economic accounting brings much needed nuance.

In conclusion, navigating the intricate contours delineating climate adaptation from grappling with uncontrolled losses is pivotal for targeted, ethical action. While conceptual ambiguities persist in light of escalating climate uncertainty, advancing context-specific metrics offers inoculation against paralysis. Quantifying hard adaptation constraints constructs navigational charts between reactive compensation, proactive resilience, and transformational solidarity. Dynamic assessment of intersectional risks to human dignity and ecological integrity allows balancing polarized perspectives. Ultimately, the path ahead mandates unifying evidenced-based cooperation upholding climate justice.

NAVIGATING THE FINE LINE: DEFINING BOUNDARIES BETWEEN ADAPTATION AND LOSS & DAMAGE IN A CHANGING CLIMATE

1. INTRODUCTION

As the world confronts the intensifying consequences of climate change, the pivotal notions of adaptation and Loss & Damage (L&D) have risen as indispensable pillars in discussions on climate resilience. In recent times, the demarcations between adaptation and L&D have grown more complex, presenting challenges for policymakers, scientists, and practitioners. As we find ourselves on the brink of a future moulded by climatic uncertainties, it is crucial to comprehend the nuances between adaptation and L&D to formulate resilient and just strategies.

This white paper critically examines the nuanced distinctions between adaptation and L&D, aiming to uncover the pivotal reasons behind establishing a clear demarcation between the two. It navigates through the complexities inherent in these distinctions, emphasizing their profound impact on shaping policies, fortifying resilience initiatives, managing financial considerations, and influencing international climate agreements. Further, the paper endeavours to illuminate the intricate consequences of blurring the lines between adaptation and L&D, emphasizing the need for delineating these foundational elements of climate change response.

Utilizing a comprehensive approach that involves scrutinizing current practices, considering international perspectives, and analysing pertinent case studies, the white paper strives to offer an understanding of the significance of differentiating between adaptation and L&D. The ultimate goal is to contribute meaningfully to the ongoing discourse on climate change response, fostering informed and efficacious approaches that address the multifaceted challenges posed by a dynamically changing climate. Finally, the need for metrics in the light of confounding and overlapping issues around loss and damage is discussed.

2. UNDERSTANDING ADAPTATION AND LOSS & DAMAGE

The discourse on L&D emerged in the early 1990s and culminated in institutional recognition by the United Nations Framework Convention on Climate Change (UNFCCC) through the Warsaw Mechanism on L&D at COP19 and subsequently in the Paris Agreement through Article 8 at COP21. Article 8 of the Paris Agreement defined for the first time the ambit of Loss and Damage as ‘recognizing the importance of averting, minimizing, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of L&D (UNFCCC, 2015). This mechanism recognizes that certain regions and communities are more vulnerable than others to the impacts of climate change and aims to address the challenges that arise from these losses and damages. Notably, Article 8 explicitly disclaims any establishment of liability or compensation, a compromise influenced in part by the cautious stance of the United States during negotiations—a major emitter of greenhouse gases (Mace & Verheyen, 2016).

2.1. DEFINITION OF LOSS & DAMAGE

Over the past eight years, there have been strides in scientific research that have substantially deepened our understanding of L&D. However, establishment of an official definition remains elusive due to diverse perspectives and policy ambiguity—stemming from the dual treatment of L&D as both a policy mechanism and an outcome of climate change.

The UNFCCC's definition of Loss & Damage, initially focused on actual/potential impacts associated with climate change in developing countries, currently acknowledges that loss and damage associated with adverse effects of climate change involve more than what can be addressed by adaptation—impacts that occur beyond adaptation (UNFCCC 2013a,b). Efforts to define L&D distinguish between 'loss' and 'damage,' where loss implies irreversible and inevitable harm, such as loss of life or biodiversity, and damage refers to reversible, repairable harm, such as financial losses or damage to uninsured infrastructure.

Conceptually, L&D is intricately linked to residual risk, extending beyond the boundaries of adaptability. Widely recognized as the repercussions persisting after concerted efforts in mitigation and adaptation (Boyd et al., 2021; Roberts and Huq, 2015; Mechler & Schinko, 2016), it signifies the realm that endures beyond the effectiveness of adaptation, demarcated by the constraints of adaptability. This continuum is characterized by inevitable risks, spanning from rigid limitations such as loss of life to more malleable limits like impacts on livelihoods (Bahinipati & Gupta, 2022).

Literature increasingly cements consensus, situating L&D as a realm distinct from adaptation, demarcated by adaptability's boundaries. The UNFCCC acknowledges this by incorporating the term 'adaptation including L&D' in its synthesis report on the technical dialogue of the first global stocktake to be held at COP 28 (UNFCCC, 2023). Henceforth in this paper, 'L&D' will refer to the political discourse. However, a lack of a formal or official universally accepted definition persists (Boyd et al., 2021), and therefore, the debate continues (Figure 1). Yet, as the discourse evolves, it is becoming evident that delineation between adaptation and L&D is important, and the metrics for determining the limits of adaptation are imperative.

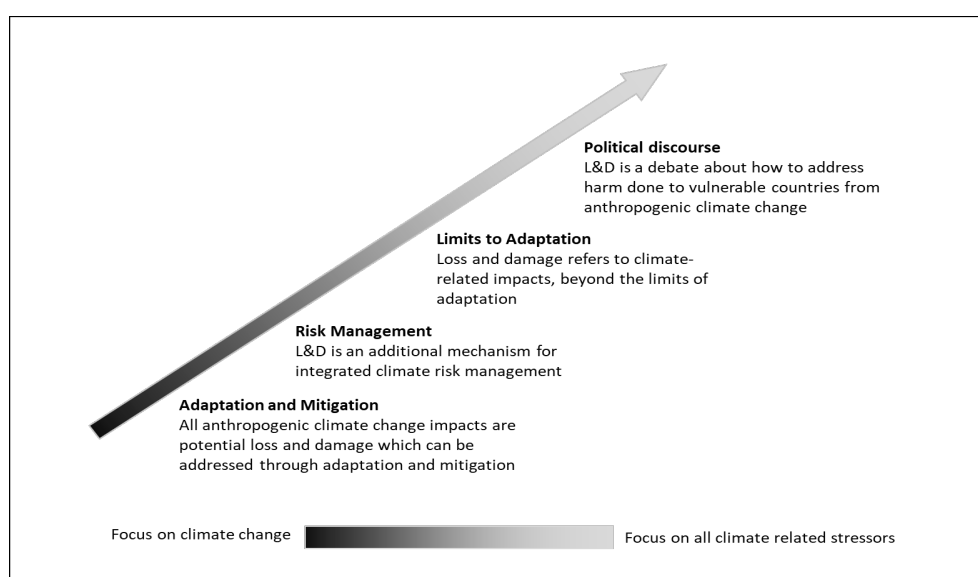


Figure 1: The different definitions of Loss & Damage (adapted from Boyd et al., 2021)

3. THE BLURRED LINE BETWEEN ADAPTATION AND L&D

While there is a definition—not official or formal—that is widely adopted, there are certain overlapping and confounding elements that make drawing a hard line differentiating the two, a challenge. First and foremost establishing a cause-effect relationship in itself is a challenge. This is because differentiating between natural variability and human-induced climate change is complex. But this differentiation is crucial as misattribution can lead to misallocation of resources. A nuanced understanding of the root cause is therefore essential to distinguish between adaptation and L&D accurately. There are other challenges such as scale and attribution too.

3.1. SCALE

A primary challenge in distinguishing adaptation and L&D lies in the vast scale of climate impacts. Adaptation often involves local or regional strategies to reduce vulnerability, such as building sea walls or implementing resilient agricultural practices. In contrast, L&D encompasses irreversible consequences, such as the loss of small island nations to the aftermath of extreme weather events. Overlapping impacts further complicate differentiation; for instance, a hurricane may trigger both immediate L&D and long-term adaptation needs.

3.2. ATTRIBUTION

In the real world, adaptation and L&D are not as mutually exclusive as we would want it to be, and there are multiple conditions under which losses and damages result (Brown, 2022; Clarke et al., 2021). Here we discuss some such situations, which make attribution a complex problem.

- *No adaptation:* Factors such as socio-economic conditions, governance structures, technological capabilities, and access to resources can complicate both adaptation and L&D (Henrique et al., 2022). For example, vulnerable communities may lack the resources or the capacity or the technological know-how to plan and implement effective adaptation strategies (Boyd et al., 2021). The lack of adaptation will inevitably exacerbate potential losses and damages that these communities may incur, requiring additional efforts for L&D (Huq & Konaté, 2019). But, some argue and fear that the focus on L&D may detract efforts to invest in climate change adaptation (Boyd et al., 2021). Either way, metrics that help determine the barriers to adaptation are needed. Further, given the limited resources for adaptation (UNEP, 2023) and L&D, robust mechanisms to delineate adaptation from L&D are important.
- *Insufficient adaptation:* While adaptation aims to reduce vulnerability and enhance resilience, there could be instances where adaptation measures are insufficient to prevent all negative impacts (Bahinipati & Gupta, 2022). In such cases, loss and damage become evident. So here is a case when a system—natural or human—incur loss and damage not because there were no efforts to adapt but because adaptation action implemented is insufficient. Now, how does one determine sufficiency or insufficiency of adaptation measures as the magnitude and severity of climate impacts is in itself uncertain? In the context of loss and damage, the effectiveness of adaptation measures as discussed earlier sometimes may be confounded by the severity and unpredictability of climate impacts. Even well-designed adaptation strategies may not be sufficient to prevent all negative consequences, especially when faced with extreme events or

rapid changes (Amaechina et al., 2022; Bhowmik et al., 2021). However the financial and technical requirements for L&D may be lower in such cases, due to the investments already made with the intent to adapt.

- *Maladaptation*: Maladaptation occurs when actions to address the impacts of climate change inadvertently lead to increased vulnerability or make it more difficult to cope with the effects. It involves implementing strategies that, despite aiming to adapt, result in negative consequences. Another layer of complexity is introduced due to the dynamic and evolving nature of climate change. In such instances, adaptation strategies that were effective in the past may become maladaptive in the face of changing climate conditions. Maladaptation thus can be a confounding factor in the L&D dialogue because it may exacerbate the adverse effects of climate change and represent a limit to adaptation, amplifying the challenges associated with L&D.
- *Dynamic nature of climate change impacts*: The spectrum of impacts that have been attributed to climate change have evolved to include L&D to not just infrastructure, people, assets and natural resources but also traditional knowledge and cultural heritage. The responses to address these look very much like adaptation and risk reduction interventions (Henrique et al., 2022).
- *Uncertain outcomes*: The effectiveness of adaptation measures are uncertain under an uncertain climate, and the outcomes can overlap or confound efforts. For example, a measure intended to be adaptive might have unintended consequences, contributing to maladaptation, under a changing climate, complicating the overall response to climate impacts.

In summary, the concepts of adaptation and maladaptation are intertwined in the L&D dialogue, and their interplay can create challenges in effectively addressing the adverse impacts of climate change. A nuanced and context-specific approach is crucial to minimize maladaptation, enhance resilience, and address the complexities of loss and damage in a changing climate. Most important of all, metrics to determine the nuanced difference is imperative.

4. BOUNDARIES AND METRICS

Confronting L&D necessitates not only climate adaptation but also grappling with historical emissions' severe repercussions. The importance of defining boundaries and metrics to enable this distinction has never been so important. Here we discuss certain principles to guide this.

4.1. PRINCIPLES FOR DEVELOPING BOUNDARY METRICS

Technical, ethical and social justice considerations are all crucial in determining adaptation limits and consequent resource allocation priorities. The complex landscape of climate risks and response capacities calls for boundary metrics to guide targeted investments in adaptation and L&D. It is important that certain principles guide the establishment of boundaries and metrics—a fundamental need for effective, ethical, and sustainable governance. Some such principles include:

- *Equitable*: Prioritizing equity in delineation is meaningful as vulnerable populations face both kinds of crises—Adaptation gap and L&D. Differential climate risks, resources and responsibilities require equitable boundary metrics considering historical contributions and capacity. Criteria such as vulnerability Index that measure a country's exposure, sensitivity and ability to adapt to

the impact of climate change could be adopted. In this effort, it is important to ensure ethical considerations are mainstreamed. This is because adaptation strategies formulated and implemented might benefit one group while inadvertently causing harm to another, leading to conflicts and challenges in addressing L&D equitably (Boyd et al., 2021).

- *Inclusive*: The development of metrics should be an inclusive process, encompassing all vulnerable stakeholders. Participation mechanisms must represent indigenous groups, marginalized communities and all types of institutions—both large and small.
- *Transparent*: Methodological transparency, with clear communication of uncertainties, enables accountability. Progress reporting on applying principles to boundary setting is also vital.
- *Adaptable*: Iterative enhancement of boundary metrics should integrate new knowledge on climate impacts, capacities, and values-at-risk. Regular evaluation of indicators, data sources and methodologies is hence key.
- *Multidimensional*: Cascading and systemic risks mean boundary assessment should examine interconnected human, ecological and physical systems. Metrics should therefore be multidimensional.

4.2. BOUNDARY CONSIDERATIONS

Systematically delineating the contours between adaptation aimed at risk reduction versus grappling with irrecoverable climate change impacts—L&D entails multifaceted boundary assessments. Such an approach ensures that adaptation strategies not only address immediate challenges but also align with broader goals of sustainability, equity, and the preservation of fundamental human and environmental values. Some key considerations include:

- *Assessing the present versus the future*: Adaptation often utilizes medium-term projections of risk trajectories leveraging emissions pathways and scenarios spanning 2050 timeframes. It pertains to future uncertainties. However, permanent L&D can manifest through immediate existential threats like small island submergence demanding immediate response.
- *Strength of attribution*: Investments into adaptation relate to modelling probabilistic risks attributable to anthropogenic climate change, hence connecting explicitly to mitigation policy commitments by major emitters. L&D may also arise from climate events where evidentiary confidence remains inconclusive in directly linking specific disasters to emissions.
- *Prioritisation of what is at risk*: Adaptation measures are designed proactively to minimize projected impacts through enhancement of buffer capacities to promote potential recovery, should consequences arise. However, possibilities of ecosystem regeneration, restoring permanently submerged land or reversing species extinction is profoundly limited, and therefore require special attention, and prioritisation.
- *What is truly at stake*: Adaptation usually affects managed infrastructure, agricultural and ecological systems, where protection investments align with development priorities. However, irrecoverable multi-dimensional L&D may transcend purely economic values to include the loss of intrinsic human rights, sovereignty, and cultural identity.

While there are overlapping and confounding elements that complicate delineation of adaptation and L&D, being cognisant of the nuances and complexities, and adopting certain principles as discussed here would help define boundary metrics. For example, a risk-based approach to defining the limits of adaptation represents a strategic and forward-looking method of addressing the challenges associated with L&D. By adopting a risk-based perspective, decision-makers can assess the potential vulnerabilities and impacts of climate change in a given local context. This approach enables targeted allocation of resources, focusing on areas where adaptation measures may reach their limits and where the risks of L&D are most pressing.

5. FINANCE

The Green Climate Fund and the Adaptation Fund play pivotal roles in channelling climate finance to countries grappling with the consequences of climate change (Omukuti et al., 2022). Despite their significant contributions to the global climate effort, these funds often encounter bureaucratic and intricate processes that impede the swift disbursement of funds. Such complexities result in delays, hindering affected nations' ability to respond effectively to L&D. Streamlining the application and approval procedures, coupled with reducing bureaucratic hurdles, is imperative to ensure rapid fund deployment. Emphasis should be placed on expeditiously providing resources to affected nations to help them recover, rebuild, and safeguard against future climate impacts. Consequently, resource allocation becomes a critical aspect of addressing L&D. Adequate financial support must be allocated transparently and equitably to assist nations and communities affected by climate change-induced losses and damages (Islam, 2022). The allocation process should be flexible enough to adapt to the evolving climate challenges and needs of affected regions.

The creation of a dedicated L&D fund is therefore a positive step towards recognizing the unique financial needs associated with the immediate and devastating consequences of climate change. The fund recognizes the urgency and unpredictability inherent in L&D situations, and the need for a rapid response and dedicated financial mechanism. Further deliberations are essential to refine and consolidate the financial and operational aspects of L&D compensation. Constructive dialogue is needed to address concerns, refine fund allocation mechanisms and establish clear guidelines for the fund's operation. In addition, the ongoing debates are a reminder of the evolving nature of the challenges posed by climate change, and the need for adaptable and innovative financial instruments.

With increasing climate extremes across the world, never before has it been clear that differentiating adaptation from L&D is pivotal. A compelling argument for treating adaptation and L&D separately is that L&D demands rapid response and dedicated funding due to its acute, urgent and abrupt nature. The flow of financial resources plays a critical role in addressing climate change. Decisions on resource allocation for adaptation strategies may inadvertently contribute to maladaptation if they are not based on a comprehensive understanding of the local context and potential long-term consequences. Furthermore, there is debate on how outcomes of current mechanisms for L&D such as compensation schemes could potentially be perceived as adaptation responses (Brown, 2022). But it is important to understand, and acknowledge that adaptation—through planned projects or proactively—can be integrated into development planning and financed through various sources. But L&D, in contrast, requires reactive and unplanned financial resources, necessitating a dedicated funding mechanism.

6. CONCLUSION

The complex interplay between adapting to climate change and contending with L&D or irrecoverable impacts underscores the need for a nuanced and targeted approach. While conceptual distinctions exist, the complexity of real-world scenarios poses challenges in attributing responses to either adaptation or L&D. The imperative to delineate these two realms is underscored by ethical, financial, and policy coherence considerations.

The establishment of adaptation boundaries becomes crucial in navigating this complexity. Dedication of resources to specific domains based on needs allows for a more effective and targeted response. Adaptation, involving planned investments to reduce risks, requires predictable funding aligned with development goals. Conversely, addressing catastrophic impacts and non-economic losses requires urgent support when adaptation limits are exceeded, emphasizing that L&D cannot be a mere extension of adaptation financing.

The quantification of adaptation limits emerges as a key aspect of this nuanced approach. Systematically determining these limits through metrics, including exposure thresholds, incremental costs, and non-economic impacts, provides clarity on the interface between adaptation and L&D. *Ex-ante* indicators enable projections of future limits, aiding in preparedness for evolving climate trajectories. Boundary metrics not only serve as demarcation points but also form the foundation for targeted responses. Advancing such metrics facilitates equitable solutions for unmet adaptation needs and irrecoverable climate impacts in vulnerable regions. By fast-tracking recovery and rehabilitation where adaptation limits are exceeded, metrics can guide compensation considerations.

In summary, the integration of "climate risk" into investments and planning remains imperative, encompassing all systems. However, the importance of quantifying hard adaptation limits cannot be overstated, especially in the face of escalating existential threats. Through systematically distinguishing between adaptation and L&D using targeted metrics, we can forge a more nuanced and equitable path in addressing the escalating costs of climate change.

7. REFERENCES

1. Amaechina, E. C., Anugwa, I. Q., Agwu, A. E., Ifelunini, A. I., Umeonuora, T. G., & Okwor, C. A. (2022). Assessing climate change-related losses and damages and adaptation constraints to address them: Evidence from flood-prone riverine communities in Southern Nigeria. *Environmental Development*, 44, 100780. <https://doi.org/10.1016/j.envdev.2022.100780>
2. Bahinipati, C. S., & Gupta, A. K. (2022). Methodological challenges in assessing loss and damage from climate-related extreme events and slow onset disasters: Evidence from India. *International Journal of Disaster Risk Reduction*, 83, 103418. <https://doi.org/10.1016/j.ijdrr.2022.103418>
3. Bhowmik, J., Irfanullah, H. M., & Selim, S. A. (2021). Empirical evidence from Bangladesh of assessing climate hazard-related loss and damage and state of adaptive capacity to address them. *Climate Risk Management*, 31, 100273. <https://doi.org/10.1016/j.crm.2021.100273>
4. Boyd, E., Chaffin, B. C., Dorkenoo, K., Jackson, G., Harrington, L., N'Guetta, A., Johansson, E. L., Nordlander, L., Rosa, S. P. D., Raju, E., Scown, M., Soo, J., & Stuart-Smith, R. (2021). Loss and

- damage from climate change: A new climate justice agenda. *One Earth*, 4(10), 1365–1370. <https://doi.org/10.1016/j.oneear.2021.09.015>
5. Brown, I. (2022). Do habitat compensation schemes to offset losses from sea level rise and coastal squeeze represent a robust climate change adaptation response? *Ocean & Coastal Management*, 219, 106072. <https://doi.org/10.1016/j.ocecoaman.2022.106072>
 6. Clarke, B. J., Otto, F. E. L., & Jones, R. G. (2021). Inventories of extreme weather events and impacts: Implications for loss and damage from and adaptation to climate extremes. *Climate Risk Management*, 32, 100285. <https://doi.org/10.1016/j.crm.2021.100285>
 7. Henrique, K. P., Tschakert, P., Coudray, C. B. du, Horwitz, P., Krueger, K. D. C., & Wheeler, A. J. (2022). Navigating loss and value trade-offs in a changing climate. *Climate Risk Management*, 35, 100405. <https://doi.org/10.1016/j.crm.2022.100405>
 8. Huq, S., Rahman, A., & Konaté, M. (2019). Loss and damage from climate change: Local-level evidence from nine vulnerable countries. In *Loss and Damage from Climate Change* (pp. 197-216). Routledge.
 9. Islam, Md. M. (2022). Distributive justice in global climate finance – Recipients’ climate vulnerability and the allocation of climate funds. *Global Environmental Change*, 73, 102475. <https://doi.org/10.1016/j.gloenvcha.2022.102475>
 10. Mace, M. J., & Verheyen, R. (2016). Loss, Damage and Responsibility after COP 21 : All Options Open for the Paris Agreement. *Review of European, Comparative & International Environmental Law*, 25(2), 197-214. <https://doi.org/10.1111/reel.12172>
 11. Mechler, R., & Schinko, T. (2016). Identifying the policy space for climate loss and damage. *Science*, 354(6310), 290-292.
 12. Omukuti, J., Barrett, S., White, P. C. L., Marchant, R., & Averchenkova, A. (2022). The green climate fund and its shortcomings in local delivery of adaptation finance. *Climate Policy*, 22(9-10), 1225-1240. <https://doi.org/10.1080/14693062.2022.2093152>
 13. Roberts, E. & S. Huq (2015) 'Coming full circle: The history of loss and damage under the UNFCCC'. *International Journal of Global Warming*. 8 (2), 141-157.
 14. UNFCCC (2013a) Report of the Conference of the Parties on its Eighteenth Session, Held in Doha from 26 November to 8 December 2012 FCCC/ CP/2012/8/Add.1 (UNFCCC, 2013).
 15. UNFCCC (2013b), Non-Economic Losses in the Context of the Work Programme on Loss and Damage, UNFCCC, United Nations, Bonn. FCCC/TP/2013/2
 16. UNFCCC (2015) 'Adoption of the Paris Agreement.' FCCC/CP/2015/L.9/Rev.1
 17. UNFCCC (2023) 'Technical dialogue of the first global stocktake - Synthesis report by the co-facilitators on the technical dialogue.' Advance version FCCC/SB/2023/9
 18. United Nations Environment Programme (2023). *Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate investment and planning on climate adaptation leaves the world exposed.* Nairobi. <https://doi.org/10.59117/20.500.11822/4379>

8. ACKNOWLEDGEMENTS

The contributors to this policy paper are all individual IPAM members.

Dr Indu K Murthy is a Principal Research Scientist heading the Climate, Environment & Sustainability Sector at the Center for Study of Science, Technology and Policy (CSTEP)—a Policy Think Tank in Bangalore, India. Her areas of research include climate vulnerability and risk, land-based climate mitigation, co-benefits, and climate adaptation. She is an IPCC and GEO author.

Dr Samraj Sahay is a Consulting Researcher based at New Delhi, India. He works in the field of climate change adaptation, health adaptation, nature-based solutions, flood risks, sustainable/regenerative agriculture, water and sanitation, and socio-economic/ecologic modeling and assessment (SSPs). His work mainly involves quantitative analysis and metrics. He has been serving as lead author and reviewer in climate related assessment reports such as IPCC, UCCRN-ARC3.3, and IPBES.

Ira Feldman is a US-based sustainability leader with a global reach and interdisciplinary skill set. His expertise lies at the intersection of sustainability and climate adaptation with extensive experience as an attorney, management consultant, policymaker, regulator, standards developer, and political advisor. He is the founder & chairman of Adaptation Leader, a not-for-profit focused on accelerating the implementation of climate adaptation approaches to enhance organizational, community, and societal resilience. Ira represents Adaptation Leader on IPAM's steering committee.

Prof Driss Ouazar ASRIC former vice-chair; Professor of Computational Hydrosocieties Engineering, IAHS Representative; Moroccan High Water and Climate Council member; Resident Member of Hassan II Academy of Science and now Director of a College; Former Member of the Higher Council of Education; Former Director/President of ENSMR Engineering School and UM6P University, Co-Chair and Host of two Post COP22 Adaptation Metrics conferences, Initiator and Founder of Adaptation Metrics and Techniques Cluster Water, Agriculture and Cities.

Dr Hikma Bachegour is a PhD in Environmental Economics. She has been involved in environment and climate projects as part of international cooperation. Her research expertise lies in the realm of macroeconomic and environmental sustainability, focusing on modelization and quantitative analysis.

Tashina Madappa is based in Bangalore, India and works at the Center for Study of Science, Technology and Policy (CSTEP), a leading policy think tank. She has over 12 years of experience working on natural resource management with a particular interest in agriculture, as well as Nature-based Adaptation Solutions (NbS). She is adept at conducting vulnerability and climate risk assessments of socio-economic and bio-physical systems. Systems thinking and its applicability to adaptation is a new found interest that she has been exploring at CSTEP.

Dr Riad Balaghi serves as Projects Director at the AAA Initiative Foundation. Previously, he held key roles at the National Institute for Agronomic Research of Morocco, including Department Head and Regional Center Head. A seasoned scientist and international consultant, he contributed to climate risk management, agricultural development, and climate change projects globally. He was a CoP22 scientific committee member, received the FAO Medal of Merit in 2009 for his outstanding work on climate change.