

Loss and Damage Fund: A New Era of Climate Justice under International Climate Law

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Article Info	ABSTRACT
Article History: Received Apr 07, 2026 Revised May 05, 2026 Accepted Jun 04, 2026 Keywords: Loss and damage (L&D) fund, Climate Risk, Financial Stress, Resilience Decline, Climate Justice	Climate Justice is fast becoming an increasingly popular issue among both researchers and implementation practitioners. Climate Justice has become an emerging issue within the climate change discourse, where climate justice narratives consistently point out the risks, vulnerability and disproportionately high burden borne by the people of the Global South, despite contributing less to climate change than other parts of the world. We examine how climate change, as well as the adaption processes, often create unequal distributional consequences, with the result that these communities are required to negotiate difficult trade-offs between social and ecological issues; therefore creating further injustice. The impact of Climate-related loss and damage (L&D) is increasingly being expressed through a cascading manner of cumulative (systemic) harm, as opposed to separate/coupled disaster events. The data further indicates the recursion and ramification through many generations of societal impacts, such as if a family loses their home due to flooding, there can be additional impact of that family losing their job/having to go into debt, resulting in long term effects for many generations. The process of L&D develops in a predictable way across multiple sectors, as demonstrated through high-lift causal sequences (e.g., Climate Risk → Economic Loss → Financial Stress → Resilience Decline). This suggests a relational vulnerability framework comprising seven systemic drivers (i.e., dependency, entitlement fragility, exposure, fragmentation, marginalisation, inequity, and resilience decline) that interact to determine and accelerate the occurrence of L&D. The results of this research challenge the traditional practices of assessing L&D through short-term asset-based losses, which do not always capture the full extent of L&D, especially non-economic or social impacts. We call for a shift from reactive compensation-based policy towards anticipatory governance by using predictive diagnostics to identify undocumented non-economic impacts of L&D and promoting equity-based, long term resilience-building initiatives. By combining ethnographic knowledge with systems modelling, this research contributes to the development of unique approaches to L&D theory and practice that will support just and forward-thinking adaptation strategies within high-risk settings.
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1. INTRODUCTION

The manner in which we adapt to climate change raises moral concern. The moral aspect of adaptation relates to the distribution of responsibility for suffering, the burden of expense associated with actions taken, and the decision-making processes regarding the actions taken. The core principles of justice and climate change are interrelated through issues of equity, rights, and historical responsibility. Most members of society understand how climate change and responses to climate change function as both disadvantage and benefit to various segments of society; however, there is little public knowledge about what is meant by the term climate justice.

The report suggests that people's vulnerability to climate change is influenced by many factors. Individual exposure rate of climate hazards, individual characteristics, and their ability to cope will determine the overall level of vulnerability to climate change. The major point in this argument is that the level of vulnerability to climate change is dependent on individuals or groups capability to respond to stressors on well-being. Well-being is tied to the "capabilities" and "functioning's" of an individual or group. An example of how this works is a flood can stop someone from going to work because they can't drop their children off at school or if they own a business but can no longer operate because it has been flooded this will produce negative effects on their income level and ability to pay bills.

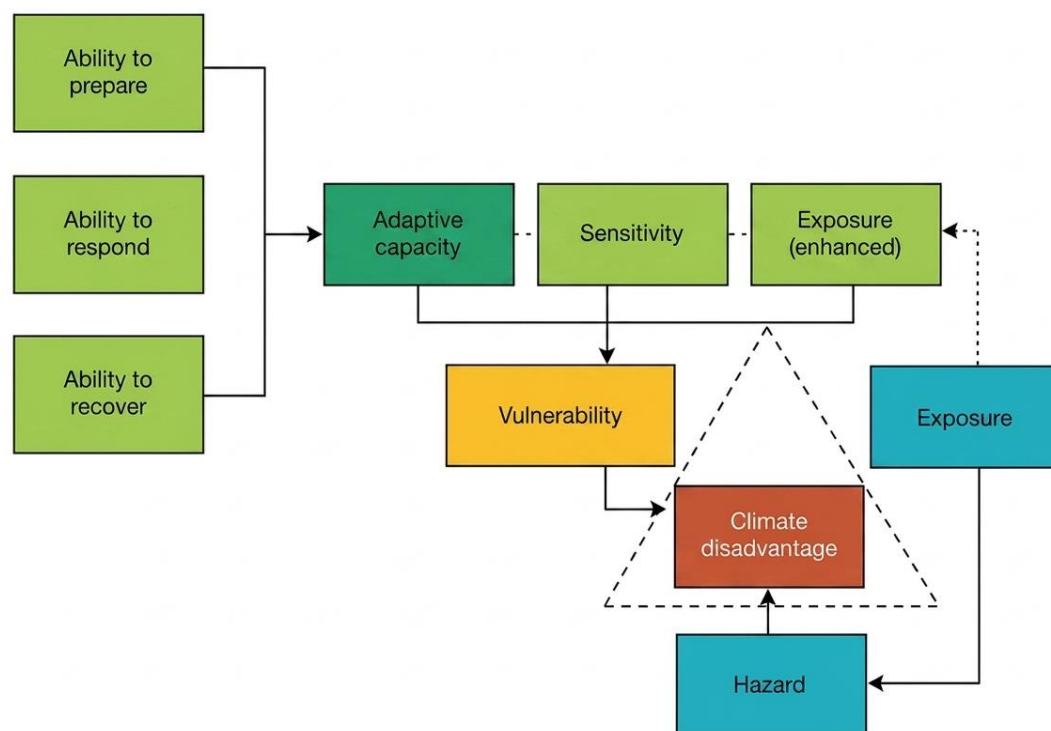


Figure 1. Climate Change Conceptual Framework

The conceptual model in Figure 1 provides useful insights into how climate disadvantage is affected by socio-spatial vulnerability and provides insights into both personal and environmental influences of adaptation policy upon vulnerability based upon research examining heat waves and floods. These personal factors relate to an individual's characteristics such as your age or health, while environmental factors relate to the physical characteristics (environment) of your neighborhood, as well as how your building is located in terms of climate vulnerability due to hazards. Even though this approach includes the social context surrounding the identified forms of

vulnerability, adaptation policies often ignore the social conversion elements, which are comprised of the personal, environmental and social aspects that convert positive or negative events to overall well-being. Environmental factors impact people's vulnerability due to their location such as living in a high-rise flat (heat waves) or in a basement flat (flooding). Social factors include social isolation, support networks, fear of crime, and institutional responses such as heating problems within care homes. All of these affect the ability of people individually or as a group to prepare for, respond to, and recover from specific climate hazards. Developing adaptation policies should be sensitive to the social context of those impacted by climate change and take into account their overall well-being when developing policies to mitigate climate change impacts and develop responses to climate change.

2. LITERATURE REVIEW

This research investigates the perceptions of Aotearoa New Zealand communities regarding "just" climate adaptation, grounded in lived experience about climate justice. Qualitative data collection involved conducting 64 in-depth interviews with previously flooding, stormed, or droughted humans, and reviewing the public submissions to the national adaptation policy process. From our qualitative analysis, we identified that the concept of climate adaptation is predominantly conceptualised by participants as being about the relationships established between (i) people, (ii) place, and (iii) non-human sources of life on Earth. In addition, we found that participants' lived experiences revealed that the principles of justice (e.g., distributive, procedural, recognition, inter-generational, corrective, epistemic, multispecies, etc.) are interrelated. Finally, we identified that participants "audit" the fairness of adaptation practices by using three basic indicators of fairness – collaborative engagement; mutual care; and government accountability, specifically when evaluating Indigenous Māori peoples' perspectives and rights of the Ecosystem as an integral component of adaptation justice outcomes. Thus, this research demonstrates that what constitutes a "just adaptation" is contingent upon the specific context within which individuals and communities exist and the relationships established between them and the environment.

A considerable amount of scholarly and non-scholarly literature examining various aspects of the relationship between gender, development, and climate change has emerged in the last 10 years. However, relatively few studies discuss how climate change adaptation relates to changing sociopolitical relations from an intersectional feminist and justice perspective. Climate change discussions have called for integrating justice, while feminist scholars have suggested that feminist perspectives must be incorporated into climate justice for it to be effective and equitable. This paper, which combines both feminist and justice perspectives, will consider how climate change adaptation mechanisms in the Sundarbans delta of Bangladesh influence the potential for just transition. It will also examine how various types of climate change adaptation can result in (re)negotiation of and are counterproductive or reinforce gender and class in this region.

The article summarizes and describes the major means of legal intervention being developed to create legal obligations to mitigate climate change. These legal strategies for mitigation can be classified into three large groups: (1) negotiating an international climate agreement; (2) creating or enforcing domestic (primarily statutory) emissions reductions; and (3) litigation to create a legal obligation (including obligations that are not defined solely as compliance with an existing treaty or statute) to reduce emissions or provide compensation (catalyst litigation).

The current research paper looks into the change of trends, commonalities, and conflicts between biodiversity governance and climate change justice throughout wetlands with a bibliometric overview for the time periods of 1973–2000, 2001–2014, and 2015–2023, while considering their historical development, keyword analysis, citation/citation history, institutions, and country-based research. There continues to be an increase in publication volumes of both concepts from many various countries but mostly produced by developed countries within organisations. Governance and adaptation are linked to other concepts and are the central ideas for conducting integrated wetland-related research. Climate justice and governance can serve as linking concepts that support wetland ecosystems' conservation efforts. There needs to be consensus among key stakeholders regarding the definitions of climate change justice and biodiversity governance before conducting research.

The inequities existing in the implementation of the green transition pose threats to the equity and political stability of the green transition. There is a need for a framework to implement the idea of a just transition that is based on evidence and informed by principles of justice. Using the framework provided by the Intergovernmental Panel on Climate Change, we define vulnerability as the combination of a household's exposure, sensitivity and ability to adapt to changes due to the transition. We quantify vulnerability by examining its incidence, intensity and level of inequality among households. We apply this framework to 88% of the Dutch household population by using administrative microdata and mapping vulnerability across three main areas: energy, mobility and physical environment. We also show how this framework can be applied to generate policy-oriented outcomes by modeling the allocation of a hypothetical government fund to mitigate vulnerability based on alternative distributional principles.

This systemized and interdisciplinary research study systematically assesses the metrics for energy, climate, and environmental justice in an umbrella review of published research literature. The current literature is enhanced by a comprehensive systematic approach to including those measures and metrics that do not lend them readily to simple quantification and to the qualitative, distributive measures that appear currently in the vast majority of the existing literature. The current umbrella review involves a systematic critical assessment of an existing body of published research across multiple disciplines, resulting in a comprehensive inventory of 2162 metrics compiled from more than five hundred published studies. These metrics were then analysed by the following characteristics: metric type, composition, overall dimensionality, impact focus, spatial scale, and time. Finally, the present review demonstrates that the existing body of metrics intersect qualitative, quantitative, and hybrid types, and that the existing metrics differ with respect to their treatment of those tenets of equity and justice; the impact of those tenets on individuals, the environment, technology, the economy, and the spatial scale.

This text highlights two pivotal moments that contributed greatly to this historic binding agreement—one at COP 19, and one at COP 27. We will analyze how these two types of disasters were referenced throughout the passage of L&D as a means of breaking down barriers created by the ongoing spiral of silence that kept "disasters" and "climate" from being connected and "climate" from being connected to "justice" in the realm of international climate policy. These two discourses illustrate a new imagination that is emerging around the concepts of human agency and inequity in an age of climate-related disasters, including the notion of a "global majority."

The Adoption of the Loss and Damage Financing Fund at COP 27 has been described as a very significant step forward. Especially in light of the fact that countries in the Global South have struggled with effective means of adaptation and mitigation of climate change impacts. This paper reflects on existing climate finance mechanisms within and outside UNFCCC through a climate

justice lens; more specifically it examines whether or not the funds intended for Loss and Damage are adequate, additional to and accessible by the world's most vulnerable nations, particularly the small island countries. The paper demonstrates that the choice of voluntary funding mechanisms to support Loss and Damage demonstrates a willful disregard for the principles of equity and justice within climate governance. The final section of this paper critiques the use of insurance-based profit-driving mechanisms as a viable means of addressing Loss and Damage issues and argues that international financial institutions must modify their governance processes to provide vulnerable countries/communities with the funding/resources that they require.

3. METHODS AND MATERIALS

3.1 Theoretical framework: Cascading Risk and Relational Vulnerability

The theoretical framework for this study is based on two interconnected bodies of scholarship. The first body pertains to the typology and cascade effects of climate-related loss and damage, which inform the first two research questions. The second body addresses the third research question by examining why loss and damage occurs and continues. These two bodies challenge the thinking that impact is the endpoint of damage, and instead conceptualise loss and damage as related and procedural processes that are realised through cascading factors at multiple levels, while rooted in the structural creation of vulnerability, not just on climate hazards.

3.2 Cascading Risk and the Limits of Impact-Based Framings

L&D is part of the first strand and is understood as an ongoing process of interaction among climate hazards and through dynamic, interrelated systems of social, economic, ecological and institutional chains, rather than a discrete or endpoint of a successful climate hazard. This points to system-based ideas of climate risk, which emphasise system feedbacks, path dependencies and compounding effects over linear A→B relationships. The early literature on climate risk and attribution has relied on the International Panel on Climate Change's (IPCC) framework of climate risk as a function of hazard, exposure, and vulnerability. While the IPCC's Sixth Assessment Report acknowledges and defines 'residual risk' and 'limits to adaptation', this framework is still largely focused on separately identifying and attributing the impacts of climate hazards to different sectors/territories. Due to this focus, IPCC's framework is definitely inadequate for capturing the multi-dimensional and cascading nature of L&D processes evident in contemporary society.

The most recent developments in our understanding of the relationship between climatic risks and the risk of property being damaged are more closely associated with the process of spatial and temporal interaction among all forms of human-made and natural disasters through interconnected systems. This new conceptual framework will establish the basis for a comprehensive assessment of complex weather-related risks that considers the dynamic nature of climatic events as opposed to a linear cause-and-effect relationship or hazard-impact relationships; this new paradigm will be based on the following principles: All environmental and human-made disasters have an impact on each other either directly or indirectly; Risk is dynamic and exists dynamically through feedback and path dependencies rather than being static, or linear and strictly additive; Developments in new literature on compound events, which explore how the physical elements associated with two, or more hazards can compound/cascade onto one another to create compound events, further reinforce this perspective; and the findings of these compound events are very different from those of univariate for the same event (i.e., they are much larger than what would have been predicted based only on the sum of the risks associated with each individual

hazard). Collectively, these findings suggest that the basic assumption of reparability of and independent nature of many impact-focused analyses is not true.

3.3 Theorizing and Situating Climate Justice in the Context of Climate Finance

In general terms, climate justice encompasses the understanding of how climate change affects people in diverse, unbalanced and unequal ways. It also addresses the need for fair and just solutions to rectifying the injustices that result. This concept was developed by social movements and civil society organisations (primarily from the Global South) to better understand the causes, impacts, and socially responsible responses to climate change. At the global level, this larger focus on justice includes the recognition that countries in the Global North have primarily caused climate change and are therefore responsible for addressing the consequences of this act, but that most of the current and future impacts from climate change will be borne by those living in the Global South. The issue of climate justice is not specifically stated in the UNFCCC text nor is it addressed in the Paris Agreement other than in the preamble.

A significant part of climate justice theory must focus on both the historical/structural element of climate change and how unequal the effects of climate crisis have been. Many forms of unequal development and global inequalities today stem from colonialism; and scholars have pointed out that there is a clear link between historic colonialism and unequal impact of climate change. Globalization and unequal exchange, together with entrenched forms of dependency, continue to forge these inequalities. Countries in the Global North, which were mainly responsible for the historic emissions that have caused the climate change crisis, also benefit significantly from this unequal world system and, consequently, have the most ability to respond to climate change. In contrast, many countries in the Global South are already facing substantial need for climate adaptation — and now face limits to adaptation and are beginning to experience significant economic and/or noneconomic loss/damage caused by climate change.

3.4 (Climate change) adaptation and its different categories

According to IPCC Working Group II (2014), adaptation is the process by which humans respond to real or anticipated climate change and its consequences. The substance and results of adaptation are the main emphasis of this work (e.g., adjusting to the concrete, biophysical repercussions of climate change in a given geographical location). We define adaptation as a socio-politically disputed governance process and emphasize the socio-political and cultural aspects of climate change adaptation. The process of socio-politics "mediates how individuals and collectives deal with multiple types of simultaneously occurring environmental and social changes." The extant literature frequently makes a distinction between planned and autonomous adaptation to climate change. Autonomous adaptation is usually context-specific, implemented in daily life, carried out by individuals and communities impacted by climate change, and often develop from locally accessible knowledge and resources, taking into account local ecological, socio-political, cultural, and economic characteristics. Planned adaptations, on the other hand, are the result of conscious policy decisions made in response to future climatic forecasts. Planned adaptations sometimes include external players in the governance and planning of adaptation processes and results within the Global South.

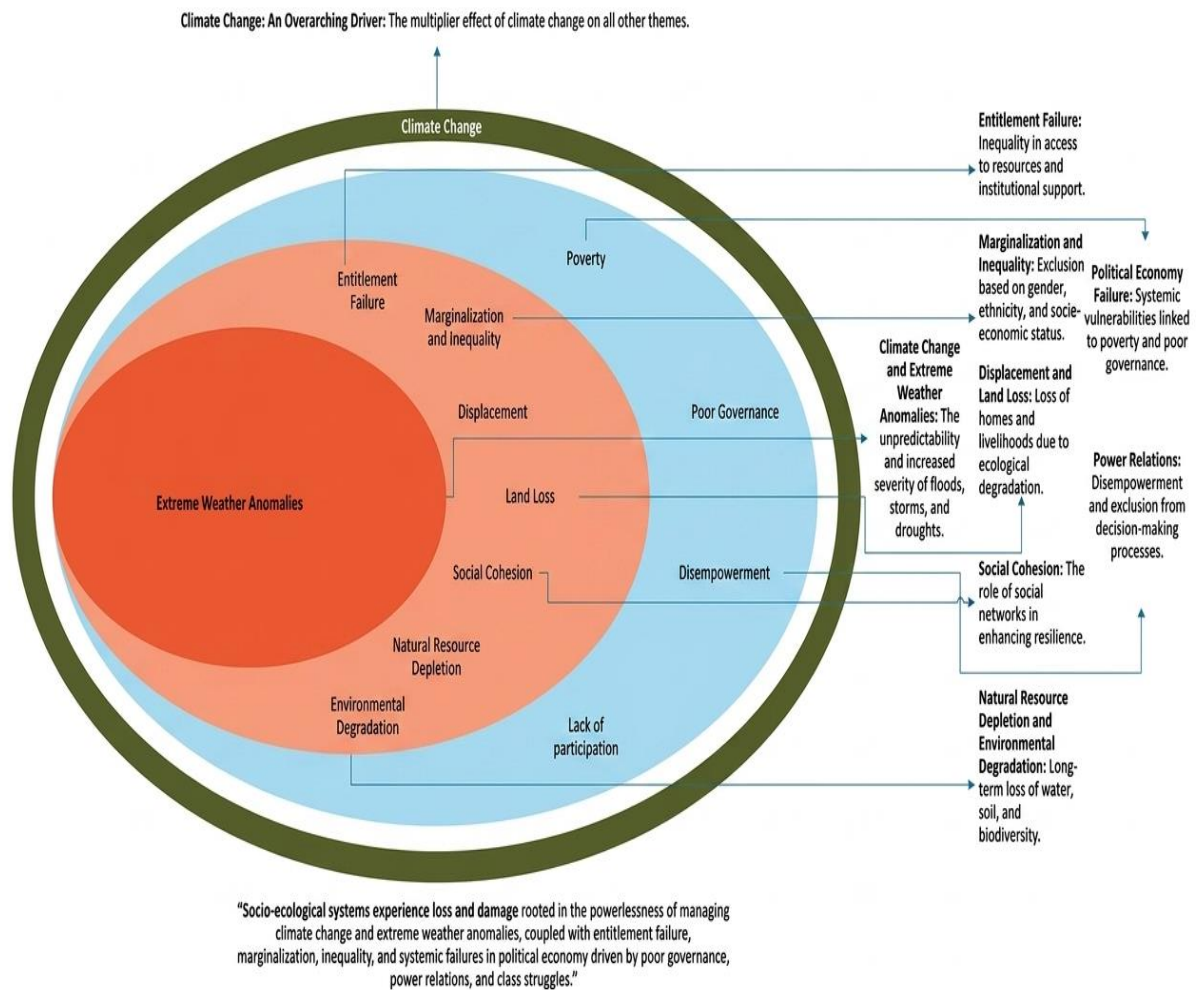


Figure 2. Conceptual Framework- Reframing Loss and Damage from a Systems Perspective

Building on these realizations, Figure 2 offers a conceptual framework that deviates from progressive or linear depictions of loss and vulnerability. The paradigm conceptualizes L&D as a relationally created and dynamically evolving process within linked socio-ecological systems, as opposed to treating it as the result of many layers or pre-existing circumstances. Although the framework is inspired by the Onion Framework, its layered logic is not replicated. Rather, it reworks this genealogy to emphasize power, feedback, and co-production in the development of cascading L&D.

4. IMPLEMENTATION AND EXPERIMENTAL RESULTS

A two-stage purposive sampling technique was used to choose participants (Table 1). First, more than 500 community-level conversations (see Table 2) were held as part of Participatory Rapid Appraisal (PRA) sessions to determine which families were most affected by loss and damage caused by climate change. In accordance with a standardized field investigation guide for climate change loss and damage included in Annex A, a combination of supervised team-based implementation and direct facilitation was used to collect qualitative data.

Table 1. Sampling of Cases on Climate Change Loss and Damage

District	Hazards	Interviewees (Male/Female)
Bagerhat	Cyclones, Coastal flooding, Salinity, Riverbank erosion	18 / 9
Cox's Bazar	Cyclones, Salinity & Water Scarcity	9 / 4
Natore	Drought, Heat stroke, Riverbank erosion, and Deforestation	15 / 8
Shariatpur	Fluvial floods, Riverbank erosion, Pluvial flooding	13 / 9
Sunamganj	Flash floods, Hailstorms, and Riverbank erosion	17 / 3

All subjects gave their informed permission before beginning the study, which was approved by institution ethics. In addition to training a diversified field crew and creating the research design and facilitating protocols, the principal author personally led over fifty interviews and focus groups across the study site. Table 2 shows the regional extent and research engagement scale.

Table 2. Regional Extent and Scale of the Research Engagement by Distributing the Qualitative Interaction Sessions by District

Theme	Bagerhat	Cox's Bazar	Natore	Shariatpur	Sunamganj
Loss and damage (housing, infrastructure, mortality, morbidity)	24	20	24	26	20
Health impacts	15	9	13	14	15
Psychosocial & gender impacts	8	5	3	6	4
Livelihood & economic impacts	9	8	5	6	6
Water, sanitation & environmental stress	12	10	7	9	12
Governance & institutions (disaster management, Upazila KIIs)	11	7	6	18	10
Education	6	7	3	4	5
Other / cross-cutting topics (calendars, mapping, case narratives)	20	35	40	14	30
Total sessions	105	101	101	97	102

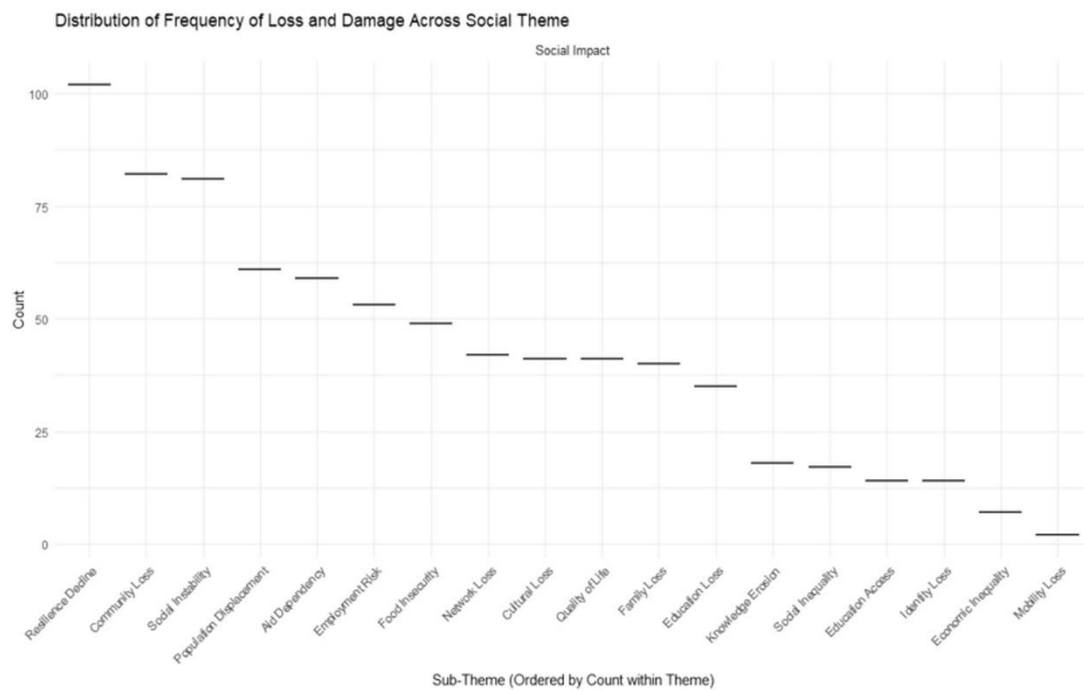


Figure 3. Distribution of Reported Loss and Damage Broken Down

Figure 3 shows the distribution of reported loss and damage broken down by sub-theme under the "Social Impact" category. Disconnection, relocation, and community disturbance are the most commonly reported types of social loss, according to the figure that shows the incidence of coded incidents across 15 sub-themes

L&D typologies are examined using thematic classification (Fig. 4), principal component analysis (PCA) (Fig. 6), and K-means clustering (Fig. 5) of statistically distinct L&D patterns across socio-demographic groups.

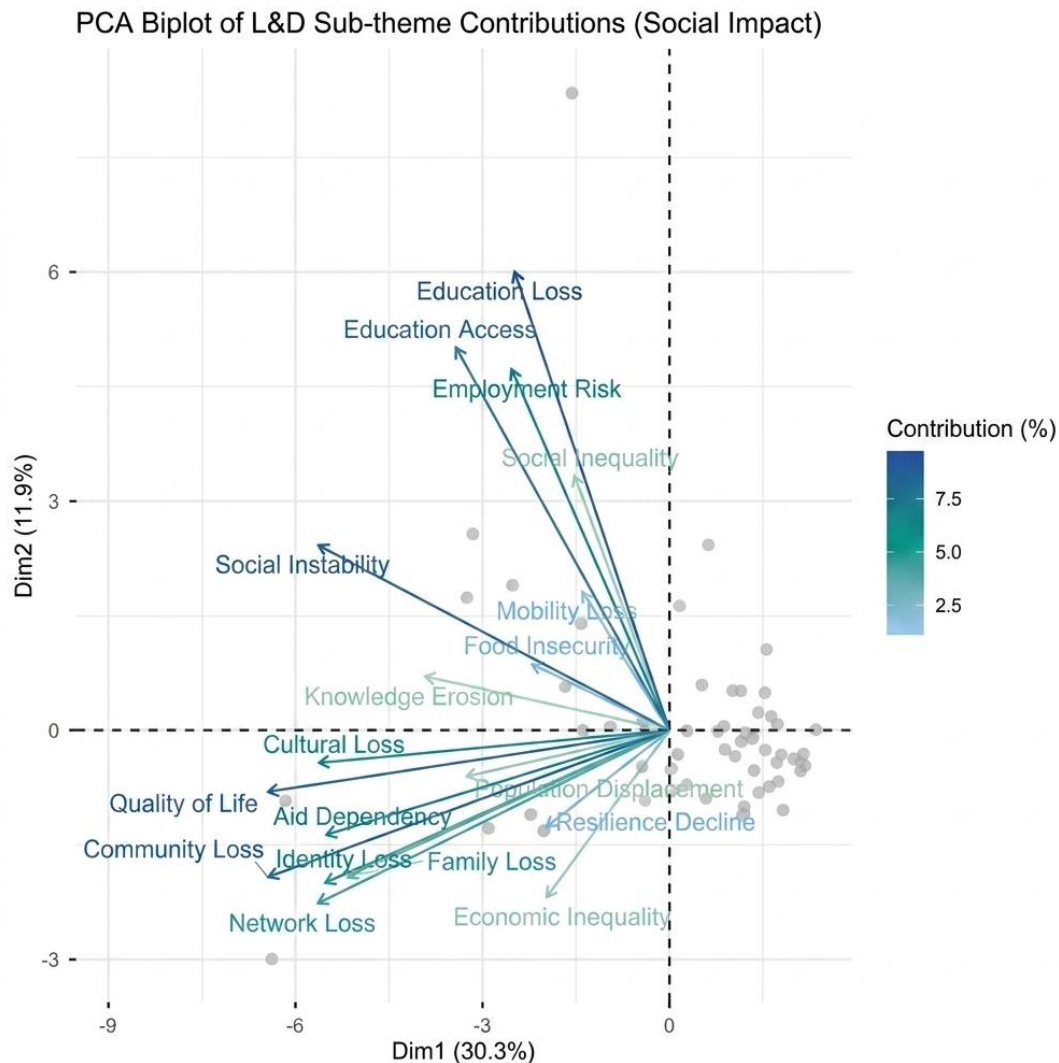


Figure 4. Biplot showing social loss and damage (L&D) sub-theme contributions using Principal Component Analysis (PCA)

We found that structural loss is systemic, showing cross-cutting deficiencies regarding educational access, erosion of resilience, and economic inequality that load heavily on both PCA axes and are central to all clusters, based on the principal component evaluation (PCA) of social L&D typologies displayed in Figure 4.

5. CONCLUSION

This research aimed at observing climate change-triggered loss and damage (L&D) is seen as not just being individual events in their own right but as multifaceted and cascading systems of impact. The study addressed three primary research questions: What are the various types or classifications of L&D that exist? How do these impacts flow or spread through the systems of people and the environment? Finally, what are the factors that create and maintain vulnerability on a systemic basis? Based on a thorough examination of the research completed through extensive fieldwork in five hazard-contingent areas throughout Bangladesh, the results demonstrate that L&D does not simply occur as an effect of one-time events but is instead a systemically structured,

continually replicated, and profoundly shaped by the underlying inequalities and failures within the existing social institutions and systems.

An essential part of this research is creating and applying relational vulnerability theory as a model for understanding and defining vulnerability over time. This framework helps to understand how vulnerability develops through social, economic and environmental interactions that are influenced by seven unique systemic drivers: dependency, entitlement fragility, exposure, fragmentation, marginalisation, inequity, and resilience decline. Through a mixed methods approach incorporating multiple sources of data: ethnographic life histories; principal component analysis; clustering; network analysis; and sequence mining, we describe ways these drivers create high risk pathways connecting social disruption, debt, health burden and infrastructure fragility leading to self-reinforcing cycles of loss. In addition, this research represents both an advancement of theory and a practical diagnostic tool for measuring and assessing cascading risk. Finally, we demonstrate that loss and damage governance needs to shift from responding to compensating for loss after it occurs, to proactive mechanisms of justice that account for symbolic, undocumented, and long-term harm especially experienced by populations that are impassively excluded from current financial technologies.

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