Prakriti Resources Centre

Navigating Loss and Damage Governance in Nepal:

POLICY & INSTITUTIONAL INSIGHTS FROM THE 2021 MELAMCHI RIVER FLOOD

Navigating Loss and Damage Governance in Nepal: Policy and Institutional insights from the 2021 Melamchi river flood

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Acronyms

APF	Armed Police Force
CCMD	Climate Change Management Division
CDO	Chief District Officer
CDRC	Central Disaster Relief Committee
DASS	Depression, Anxiety, and Stress Scale
DCC	District Coordination Committee
DDMC	District Disaster Management Committee
DHM	Department of Hydrology and Meteorology
DoWIDM	Department of Water-Induced Disaster Management
DPRP	Disaster Preparedness and Response Plan
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
ELD	Economic Loss and Damage
FGD	Focus Group Discussion
FCGO	Financial Comptroller General Office
FRLD	Fund for Responding to Loss and Damage
GLOF	Glacial Lake Outburst Flood
KII	Key Informant Interview
LAPA	Local Adaptation Plans of Action
L&D	Loss and Damage
LDMC	Local Disaster Management Committee
LDOF	Landslide Dam Outburst Flood
MIS	Management Information System
MoAC	Ministry of Agriculture and Cooperatives
MoF	Ministry of Finance
MoFAGA	Ministry of Federal Affairs and General Administration
MoFALD	Ministry of Federal Affairs and Local Development
MoFE	Ministry of Forests and Environment
MoHA	Ministry of Home Affairs
MoHP	Ministry of Health and Population
MoIAL	Minister of Internal Affairs and Law
MoPIT	Ministry of Physical Infrastructure and Transport
MoWRI	Ministry of Water Resources and Irrigation
MWSDB	Melamchi Water Supply Development Board
NCDRRM	National Council of Disaster Risk Reduction and Management
NAP	National Adaptation Plan

Acronyms

NDC	Nationally Determined Contribution
NELD	Non-Economic Loss and Damage
NDRF	National Disaster Response Framework
NDRRMA	National Disaster Risk Reduction and Management Authority
NPC	National Planning Commission
ODI	Overseas Development Institute
PCCCC	Provincial Climate Chage Coordination Committee
PDMC	Provincial Disaster Management Council
PDMEC	Provincial Disaster Management Executive Committee
PMDRF	Prime Minister's Disaster Relief Fund
PRC	Prakriti Resources Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WDMC	Ward Disaster Management Committee
WIM	Warsaw International Mechanism

Executive Summary

About the Study

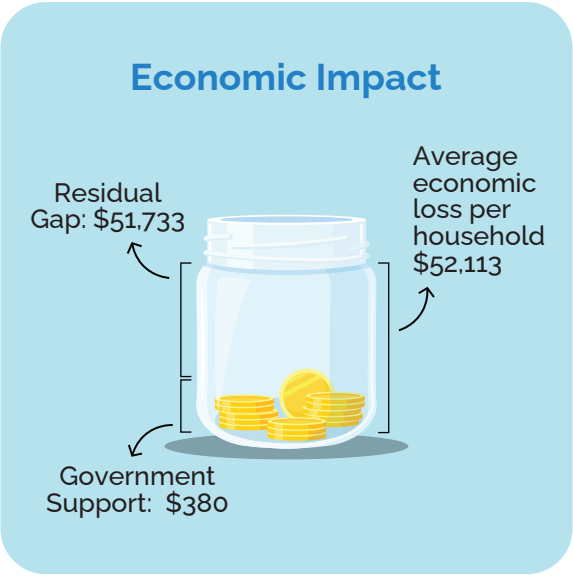
Nepal is experiencing increasingly severe climate-induced disasters in recent years, with the 2021 Melamchi river flood in Sindhupalchok district emerging as a critical case for understanding the country's institutional and financial response and recovery mechanism to loss and damage (L&D) in the face of such disasters. While Nepal has made substantial progress in developing climate change and Disaster Risk Reduction (DRR) policies, major gaps remain in translating these frameworks into effective and equitable recovery, particularly for long-term livelihood impacts and Non-Economic Loss and Damage (NELD), such as cultural loss and psychosocial impacts.

This study adopts a mixed-methods with multi-source approach to examine how L&D is governed and operationalised in Nepal, drawing on the evidences of Helambu and Melamchi municipalities. It integrates four thematic components: (1) a structured policy review, (2) a cultural loss and damage study, (3) a grounded psychosocial impact assessment, and (4) a locally led valuation of economic and non-economic loss across 120 households. Data were collected through policy and institutional analysis, household surveys, focus group discussions, key informant interviews, and validation workshops.

The Melamchi river flood and its Aftermath

The Melamchi river basin is highly exposed to both seismic and climate-related hazards. In June 2021, extreme rainfall, rapid snow, and ice melt triggered cascading geomorphic processes resulting in landslides, which led to the formation of a temporary landslide-dam and subsequently a catastrophic landslide-dam outburst flood. The resulting debris-laden surge destroyed homes, roads, bridges, the Melamchi river water supply infrastructure, agricultural land, and local businesses downstream of Melamchi valley. Scientific studies conducted so far have confirmed that this was a multi-hazard, climate-influenced event driven by intense precipitation and temperature driven snowmelt.

The economic impacts of the disaster were profound. Survey of 120 households reveal extensive loss of agricultural land, seasonal crops, and livestock, with 53% of surveyed households reporting loss of agriculture-related income. Key local livelihoods, such as rice farming, trout aquaculture, and tourism, were severely disrupted. Respondents identified land loss as the most significant category of economic loss (33%), followed by damage to houses (25%), crops (18%), livestock (12%), fisheries (1%), and other assets (11%). On average, affected households lost 0.183 hectares of land in Helambu rural municipality and 0.259 hectares in Melamchi municipality.



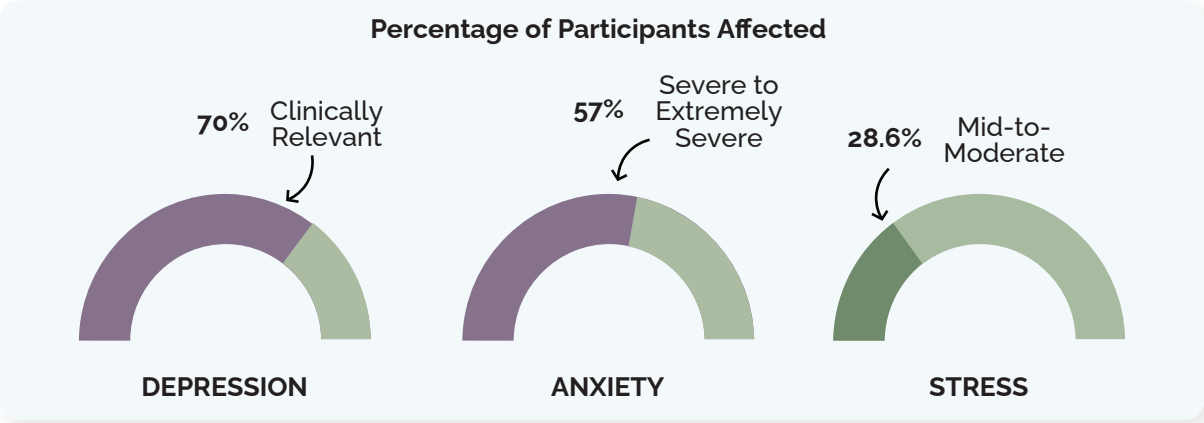
The estimated average economic loss per household reached around USD 52,113. However, households received an average of only USD 380 in support by the government, leaving a residual gap of roughly USD 51,733. At the municipal scale, total economic loss was estimated at USD 436 million in Melamchi and USD 204.56 million in Helambu far exceeding their annual budgets of USD 10.5 million and USD 3.8 million respectively. This disparity underscores the structural inadequacy of existing domestic resources to address large-scale climate-induced disasters and highlights the need for dedicated national and international L&D finance.

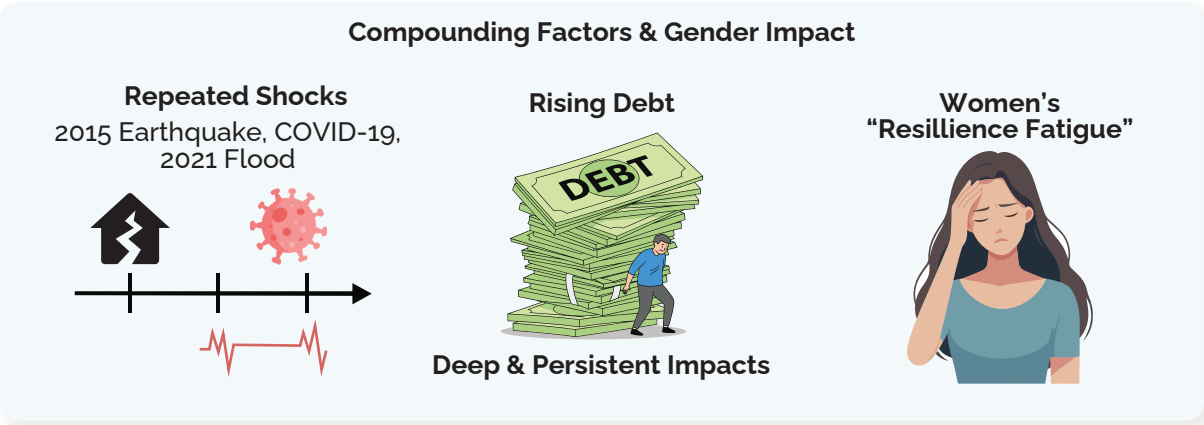
Non-economic Loss and Damage (NELD) owing to the Melamchi river flood has been equally severe but far less recognised and estimated. The flood destroyed and damaged several emples, stupas, cremation sites, community halls, and traditional settlements, disrupting festivals, rituals, and communal gatherings that underpin social cohesion and identity. Sacred sites, such as the Indreshwar Mahadev Temple and its precincts and cremation ghats along the Melamchi river, lost critical infrastructure, disrupting families' ability to conduct dignified last rites. For marginalised communities such as the Majhi, who are already shifting away from their traditional fishing livelihoods, the disaster further eroded their cultural practices and undermined their sense of belonging.

Psychosocial impacts remain deep and persistent. A Depression, Anxiety and Stress Scale - 21 Items (DASS-21) survey in the two areas found that nearly 70% of participants experienced clinically relevant depression, 57% met anxiety thresholds (with nearly a quarter falling within the "severe to extremely severe" range), and 28.6% reported mild-to-moderate stress. These conditions are compounded by repeated earlier shocks, including the 2015 earthquakes, COVID-19, and recurrent flooding, alongside rising debt, forced migration, and uncertain futures. Women, who are often left behind when men migrate, shoulder disproportionate care and preparedness burdens, leading to "resilience fatigue" as they repeatedly prepare for evacuation and rebuild with limited support.

Despite trauma and cultural disruption, communities have demonstrated notable resilience. They have adapted by constructing makeshift cremation platforms, revived festivals in new locations, and mobilised youth groups to restore traditional music and cultural practices. However, these locally driven efforts receive minimal recognition or support within formal DRR and recovery frameworks, which remain heavily focused on physical reconstruction.

Pshychosocial Impact





Policy, Institutional, and Financial implications

On the policy front, Nepal has a relatively robust framework for addressing L&D, including the Environment Protection Act (2019), the National Climate Change Policy (2019), the National Framework on Climate-Induced Loss and Damage (2021), the Disaster Risk Reduction and Management (DRRM) Act (2017) and its Regulation (2019), the National DRR Policy (2018), and various provincial and local laws. These instruments collectively recognise climate-induced disasters and provide multiple entry points for addressing both economic and non-economic loss.

In practice, however, policy and legal provisions remain narrow and relief oriented. Compensation frameworks prioritise housing damage, fatalities, and minimal immediate household needs, while losses related to agricultural land, diverse crops, small-scale infrastructure, private and communal assets, business enterprises, and cultural properties are either weakly covered or excluded altogether. Although non-economic loss is explicitly recognised in the L&D Framework and the Nationally Determined Contribution (NDC) 3.0, they lack clear operational mechanisms, guidance, and financing. Psychosocial support, for instance, is formally mandated but it remains severely understaffed.

Institutionally, Nepal's climate and disaster governance landscape involves multiple bodies at the federal, provincial, and local levels, including the Environment Protection and Climate Change Management Council under the Ministry of Forests and Environment and DRRM structures under the Ministry of Home Affairs and the National Disaster Risk Reduction and Management Authority (NDRRMA). However, the Melamchi case demonstrates that climate coordination councils were slow to activate and did not prioritise the flood, while disaster management committees though more responsive operated largely within conventional relief-first paradigms. Overlapping mandates, unclear focal responsibilities for L&D, and political interference continue to undermine coherent coordination and equitable support.

Financially, Nepal relies on a fragmented mix of funds and budget lines. National standards provide limited relief (e.g., NPR 15,000–20,000 per affected household and NPR 200,000 per death) while local instruments, such as the Melamchi Disaster Management Fund and the Environment and Natural Resource Conservation Fund of Melamchi municipality, offer modest support for housing, livestock, and selected non-economic services. Sectoral ministries finance infrastructure repair from their own budgets. The blanket policy of providing a maximum of NPR 500,000, regardless of the scale of loss and damage, is widely contested. This is reflected in the nearly 78% dropout rate among households receiving the third instalment of financial relief in Melamchi, indicating serious lapses in implementation that warrant critical review.

Notably, there is no provision for providing financial support for land loss and loss of private business enterprises, arguably the most critical livelihood asset, leaving major dimensions of L&D unaddressed. Complex procedures, weak information systems, shifting government priorities, and the underestimation of cultural loss further constrain recovery that is effective, timely, and fair.

Looking Forward and Areas for Improvement

The Melamchi river flood case study demonstrates how climate-induced disasters cause interconnected economic and non-economic loss and damage. It also highlights the need for a tailored, context-specific understanding of the related socio-economic, cultural, and gender dimensions.

Looking forward, the Government of Nepal plans to designate the Ministry of Forests and Environment (MoFE) as the national authority for L&D and focal point to the Fund for Responding to Loss and Damage (FRLD), working through the Climate Change Management Division. The proposed approach aims to: (1) use existing DRRM structures and funds to channel L&D finance; (2) mobilise resources via the Ministry of Finance and nationally accredited entities; and (3) support immediate- and longer-term interventions, including building resilient infrastructure, early warning systems, social protection, and inclusive insurance.

But the Melamchi experience has demonstrated that this emerging framework must go beyond the existing narrow, relief-based paradigm. To ensure just and comprehensive recovery, Nepal needs:

1. Clear strategies and action plans to implement the National L&D Framework at all levels, with explicit attention to both economic and non-economic losses.
2. Stronger, well-defined institutional coordinationalnd role clarity across climate and DRR agencies, particularly through a decentralised and localised institutional modality that is more vibrant and responsive.
3. A dedicated and transparent L&D financing window that addresses livelihood assets, cultural heritage, and psychosocial well-being that draws on international, domestic, private, and innovative sources.
4. Improved data tracking, and Management Information System (MIS) software to enable transparent, timely, and accountable fund allocation.
5. Inclusive risk-transfer mechanisms and capacity-building measures to enhance local resilience.
6. A multistakeholder platform for enhance co-creation and knowledge exchange among major government bodies and other stakeholders.

Without these reforms, communities such as those in Melamchi and Helambu that are at imminent risk of climate-induced disasters will remain trapped in a cycle of disaster and inadequate recovery, and Nepal's efforts to access and utilise global L&D finance will fall short of delivering equitable and transformative outcomes for its most vulnerable citizens.

Introduction

1.1. Background

Vulnerable and developing countries face the greatest risks from climate extreme events (WRI, 2022)[1], as they often lack the financial, technical, and institutional capacities to cope with and recover from economic and non- economic losses and damages (Warner & van der Geist, 2013)[2]. In South Asia, countries like Nepal are already experiencing shifting rainfall patterns, glacier retreat, increased flooding and landslides, and prolonged droughts that threaten livelihoods, food security, and critical infrastructure (ICIMOD, 2022)[3]. These compounding stresses underscore the urgency of addressing loss and damage as a governance and policy challenge, rather than merely the outcome of climate change.

The term 'Loss and Damage', or 'L&D', has gained significant traction in global climate discussion representing the adverse impacts of climate change that exceed the limits of mitigation and adaptation (Roberts & Pelling, 2018)[4]. These impacts range from the destruction of physical assets to irreversible cultural and ecological loss, increasingly shaping the global discourse on climate justice and responsibility (Mechler et al., 2019)[5]. The institutional evolution of L&D lies at the intersection of disaster risk management (DRM) and climate change, reflecting both immediate- and long-term impacts[6]. Broadly, it encompasses both irreversible losses (e.g., biodiversity and cultural heritage loss) and damages that can be recovered (e.g., damage to infrastructure). At its core, L&D focuses on protecting communities, ecosystems, and livelihoods while promoting climate justice (Huggel et al., 2022)[7]. However, there is an absence of a universally accepted definition of L&D. Scholars such as Boyd et al. 2017[8] describe loss and damage as the residual impact that remains after all mitigation and adaptation options have been exhausted[9].

Under the United Nations Framework Convention on Climate Change (UNFCCC), L&D is recognised as arising from both, extreme events (such as floods, storms, and heatwaves) and slow-onset processes (such as glacier melt, land degradation, and desertification). It is commonly categorised into two broad types: (1) Economic loss, which can be monetised or measured in financial terms, including damage to infrastructure, crops, and livelihoods; and (2) non-economic

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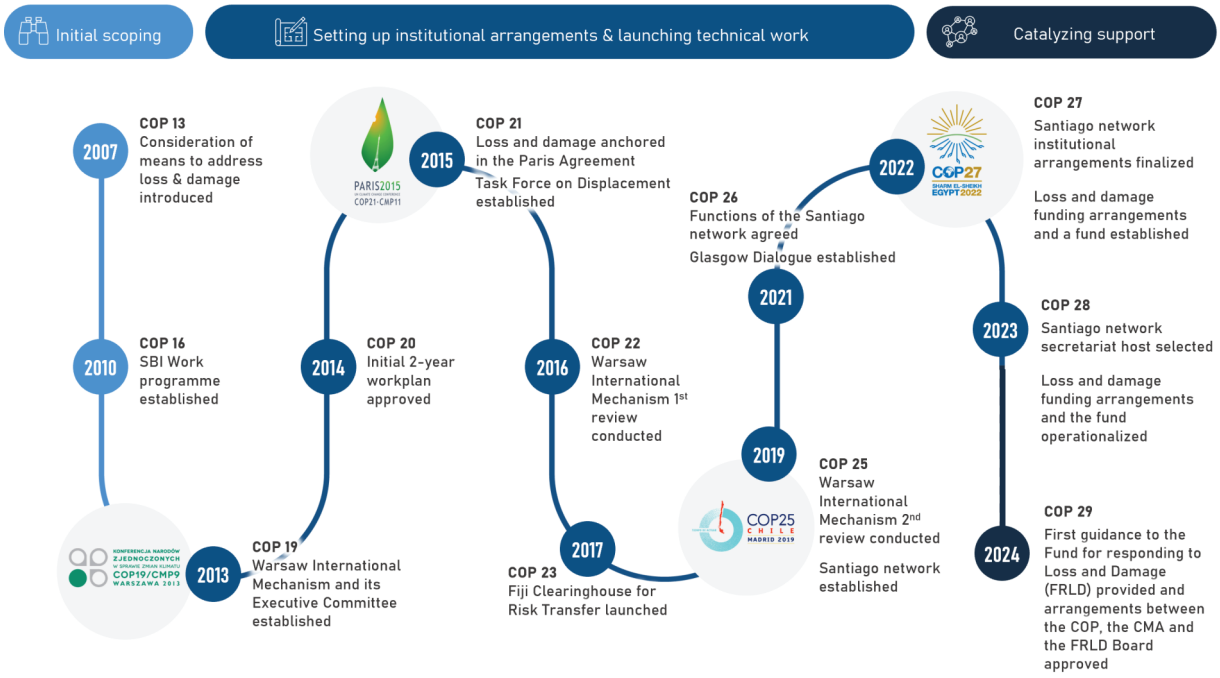
[1]*Intergovernmental Panel on Climate Change (IPCC). (2022). Climate change 2022: Impacts, adaptation and vulnerability. Cambridge University Press.*
[2]*Warner, K., & van der Geest, K. (2013). Loss and damage from climate change: local-level evidence from nine vulnerable countries. International Journal of Global Warming, 5(4), 367–386.*
[3]*ICIMOD. (2022). Impacts of climate change on the cryosphere, hydrological regime and glacial hazards in the Hindu Kush Himalaya. International Centre for Integrated Mountain Development. https://www.icimod.org/resource/impacts-of-climate-change-on-the-cryosphere/*
[4]*Erin Roberts & Mark Pelling (2018) Climate change-related loss and damage: translating the global policy agenda for national policy processes, Climate and Development, 10:1, 4-17, DOI: 10.1080/17565529.2016.1184608*
[5]*Mechler, R., Bouwer, L. M., Schinko, T., Surminski, S., & Linnerooth-Bayer, J. (2019). Loss and damage from climate change: concepts, methods, and policy options. Springer Nature.*
[6]*Calliari, E. (2018). Loss and damage from climate change impacts: a political science perspective.*
[7]*Huggel, C., Bouwer, L.M., Juhola, S. et al. The existential risk space of climate change. Climatic Change 174, 8 (2022). https://doi.org/10.1007/s10584-022-03430-y*
[8]*Boyd, E., James, R. A., Jones, R. G., Young, H. R. and Otto, F. E. L. (2017) A typology of loss and damage perspectives. Nature Climate Change, 7. pp. 723-729. ISSN 1758-678X doi: 10.1038/nclimate3389 Available at https://centaur.reading.ac.uk/81728/*
[9]*van der Geest, K., & Warner, K. (2020). Loss and damage in the IPCC Fifth Assessment Report (Working Group II): a text-mining analysis. Taylor and Francis. Climate Policy, 20(6), 729–742. https://doi.org/10.1080/14693062.2019.1704678*

loss, which are more difficult to quantify but often more profound, encompassing the loss of lives, health, ecosystems, cultural heritage, identity, and traditional knowledge systems (Steadman et al., 2022)[10].

The concept of L&D emerged at the 11th edition of the Conference of the Parties, or COP11, in Montreal, Canada, as a mechanism for compensation for climate-related damages. In 2013, at COP19, the Warsaw Mechanism was established to enhance knowledge, coordinate efforts, and mobilise support for developing countries. In 2016, at COP21, L&D was recognised as the "third pillar of climate change" in the Paris Agreement. Then in 2019, the Santiago Network was established during COP25 to provide technical support to developing countries for L&D risk assessment, policy, and recovery planning. For financial support, the Fund for Responding to Loss and Damage (FRLD) was approved at COP28 (2023, Dubai) with initial pledges totalling USD 700 million. However, this accounts for less than 0.2% of the estimated annual funding needs (Pill & Hammersley, 2024)[11]. As per recent updates, COP30 further advanced the FRLD by issuing a USD 250 million call for funding requests for its 2025-2026 start-up phase, creating a concrete pathway for vulnerable countries to submit proposals.

Loss and damage milestones under the UNFCCC process



Source: https://unfccc.int/process-and-meetings/bodies/constituted-bodies/wim-excom/chronology

While international debate around L&D has focused on global finance mechanisms and compensation, the national and local governance of L&D funds is equally crucial. Governance of L&D involves institutional arrangements, policies, and coordination mechanisms that enable countries to anticipate, assess, respond, and recover from climate-induced losses (Roberts et al, 2013)[12].

In Nepal, L&D has gained prominence as climate-induced disasters become more frequent and intense. The country's mountainous terrain, fragile ecosystems, and socio-economic vulnerabilities expose communities to both sudden and slow-onset losses. Although Nepal has frameworks for L&D, disaster risk reduction and climate adaptation, significant institutional, policy, and implementation gaps remain in addressing residual losses that exceed adaptive capacity.

The Melamchi river flood is a critical case for understanding these governance challenges. The flood and debris flow that struck the Melamchi valley destroyed infrastructure and communities, exposing weakness in institutional coordination, policy implementation, and existing mechanisms for addressing residual losses that could not be prevented or recovered. As such, the Melamchi river flood case offers important insights into how Nepal's policy landscape conceptualises and responds to L&D, and what institutional capacities and financial resources are required to strengthen governance in this emerging area of climate policy.

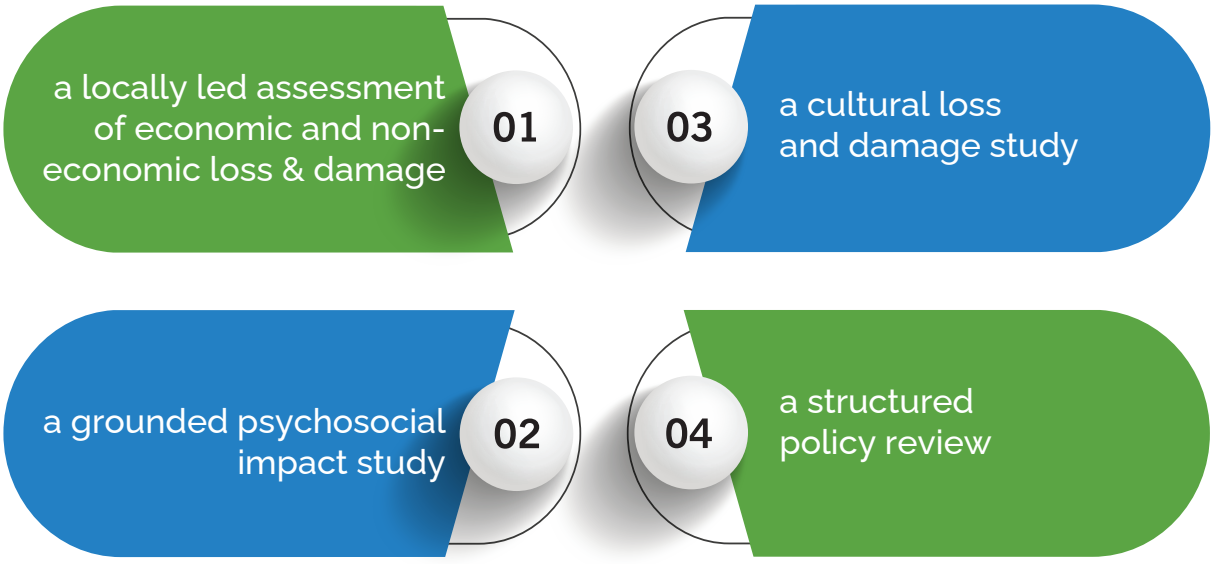
Source: Onlinekhabar

Methodology and Approach

This study employed a mixed-methods with multi-source design to assess L&D to guide institutional strengthening and financial mobilisation for more effective future response and recovery. Fieldwork was conducted in the most affected areas of Helambu and Melamchi municipalities, following ethical protocols such as informed consent, trauma-sensitive engagement, and local-language facilitation. Stakeholder consultations and validation workshops triangulated findings across data sources.

A multifaceted analytical approach was adopted, incorporating thematic and content analysis, a grounded theory approach[13], policy mapping, and quantitative valuation. The research framework (outlined in Figure 1) integrates multiple thematic components, supporting the development of an evidence-based final report. In addition, an assessment of existing policies and institutional structures clarifies how they facilitate or hinder effective response and recovery in the case Melamchi river flood. This comprehensive approach not only identifies key challenges but also reveals opportunities to strengthen resilience and improve governance in the face of climate change impacts.

The findings are drawn from institutional and policy analysis, with reference to lessons learned from the 2021 Melamchi river flood. The results are the synthesis of four thematic studies conducted on the Melamchi and Helambu between December 2023 and December 2025:



Together, these studies provide comprehensive evidence on governance frameworks, lived experiences, cultural disruptions, community trauma, and financial gaps following the flood.

2.1. Data Sources and Verification

The policy review used structured content analysis of key documents, including the Environment Protection Act (2019), the National Climate Change Policy (2019), the National Framework on Climate-Induced Loss and Damage (2021), the Disaster Risk Reduction and Management (DRRM) Act (2017) and the DRRM Regulation (2019), the National Policy for Disaster Risk Reduction (2018), the Disaster Victim Rescue and Relief Standards (2020), the DRRM and Climate-Resilient Municipal Development Act (2018), the Melamchi Disaster and Management Fund (Operation) Procedure (2021), the Local Government Operationalization Act (2017), including provincial and local level acts, policies, and guidelines.

A matrix-based tool was used to assess coherence and to identify policy-level, institutional, and financing gaps by systematically mapping policy objectives, responsible institutions, and implementation mechanisms. This was complemented by key informant interviews with four experts and a National Loss and Damage Policy Lab (LDPL) programme that validated findings and captured contextual nuances.

The study also integrated cultural, psychosocial, and locally led L&D assessments to capture the flood's multifaceted impacts. The cultural assessment of tangible, intangible, and natural heritage followed Overseas Development Institute Global (ODI Global) and United Nations Educational, Scientific and Cultural Organization (UNESCO) frameworks and used focal group discussions (FGDs) and semi- structured interviews. The psychosocial study examined mental and emotional well-being through interviews, FGDs, a Depression, Anxiety, and Stress Scale-21 (DASS-21) survey, and hospital record reviews. The L&D finance assessment combined surveys, mapping, and consultations to estimate economic loss across 120 households. Figure 1 outlines the overall methodology.

Multi-faceted analytical approach

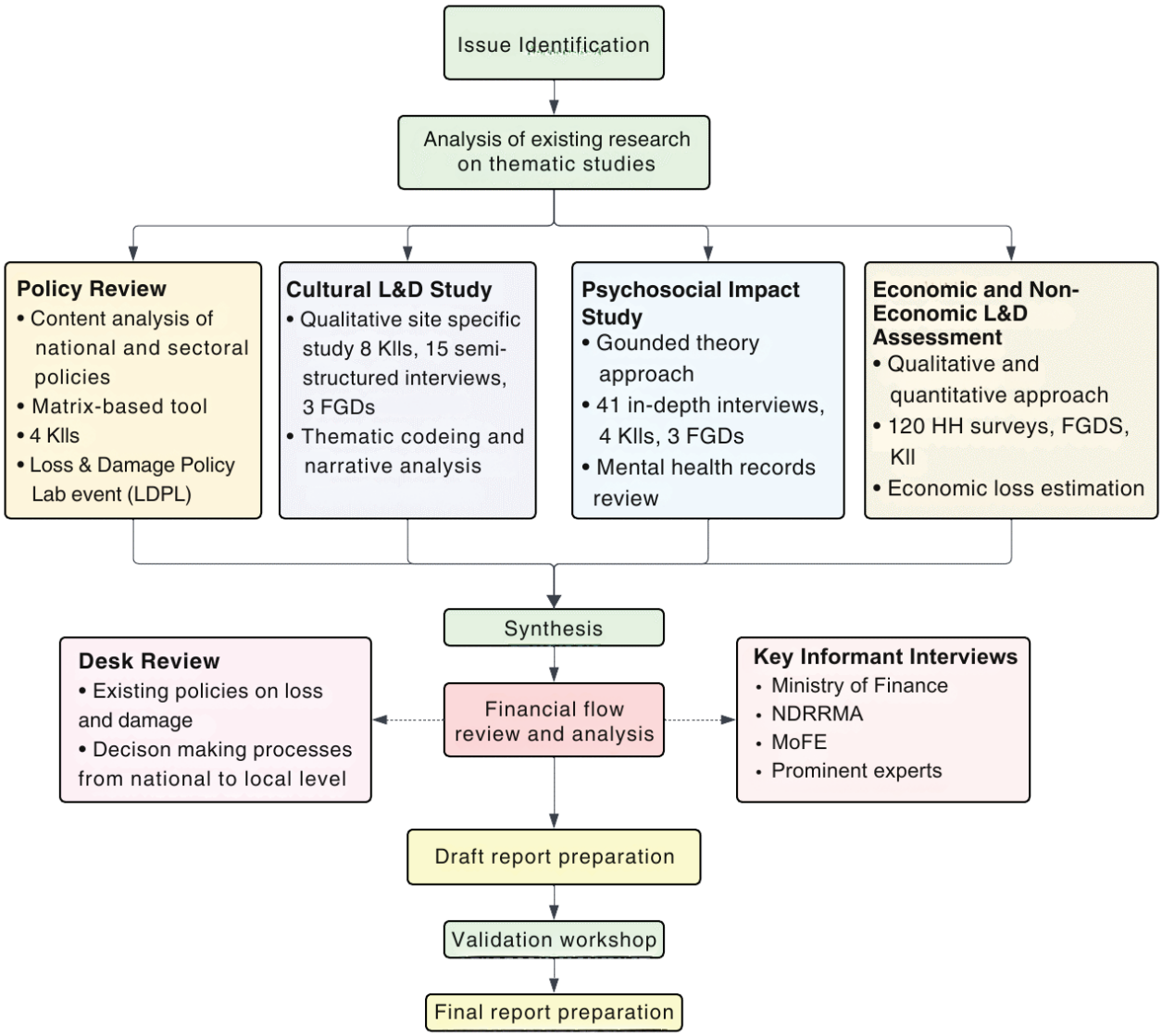


Figure 1: Methodological flowchart

3. Loss and Damage: A Case of the Melamchi River Flood

The study's findings are organised around three complementary and interrelated assessments conducted by Prakriti Resources Centre (PRC): (1) a qualitative assessment of cultural heritage loss, (2) a grounded analysis of psychosocial impacts, and (3) a locally led assessment of economic and non-economic loss. This integrated approach provides a comprehensive understanding of the physical, social, and economic dimensions of loss and damage from the Melamchi river flood.

3.1. Melamchi River Flood

The Melamchi river flows through the Melamchi and Helambu municipalities in Sindhupalchok district, Bagmati Province. These municipalities span a wide range of climatic zones, from alpine areas at high altitudes to subtropical zones. The river originates from the snow-fed Langtang and Jugal Himal ranges, making it a vital water resource for the Melamchi Valley. The valley receives peak rainfall during the monsoon season (June–August), while January and February receive the least rainfall. During the monsoon, the Melamchi river basin receives more than 12 mm of rainfall per day (DHM, 2021)[14].

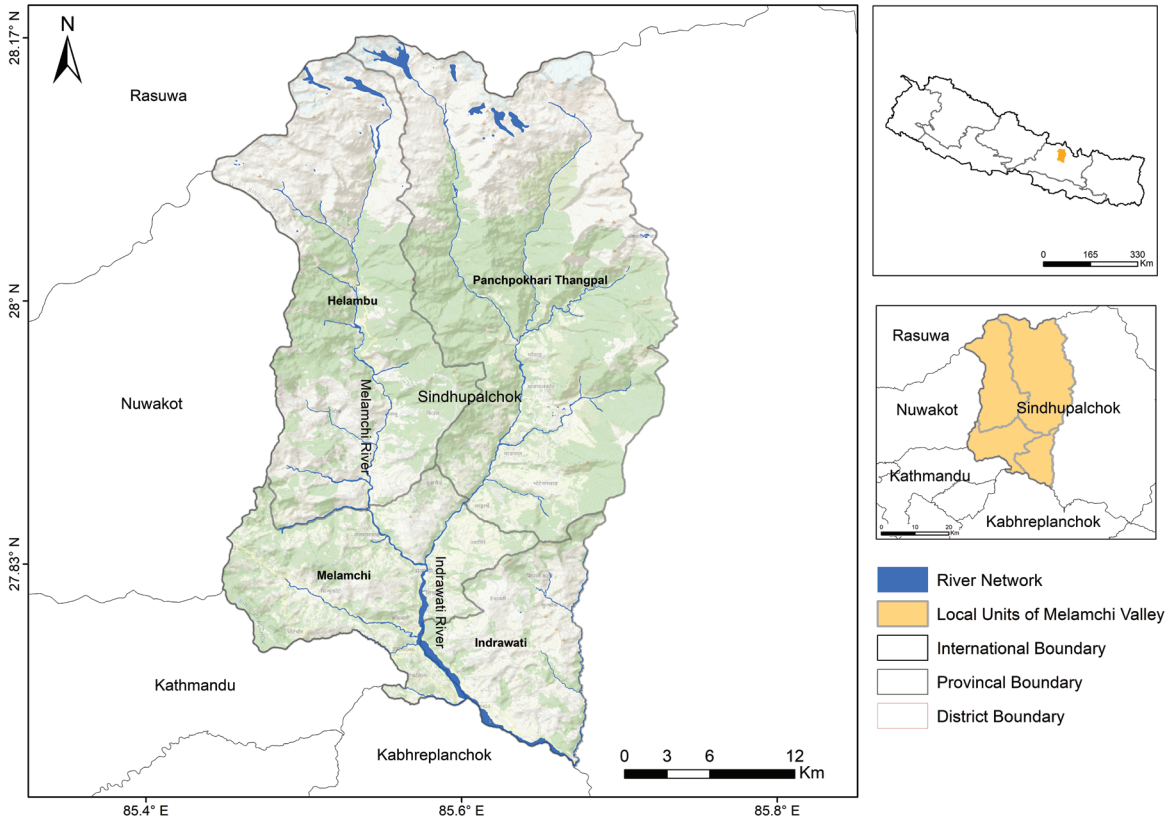


Figure 2: Four local governments of Sindhupalchok district that form the Melamchi Valley

The region is highly vulnerable to extreme events, a reality that has become increasingly evident in recent years. In 2015, it suffered severe damage in the eart quakes that rattled Nepal. Again, in 2021, the region was devastated by flash floods, debris flows, and landslides that destroyed homes, infrastructure, and livelihoods. These repeated disasters underscore the region's exposure to both seismic and climate-related hazards, making it a disaster hotspot[15]. A recent study

Baniya et al. (2024), examining precipitation, temperature, snow depth, and discharge data from 1992–2021, confirms that the basin's annual rainfall exceeds the national average. The study also showed that there is a positive correlation between rising temperature and temperature driven snowmelt, indicating that precipitation is the primary climatic driver, with snowmelt acting as a secondary driver (Baniya et al 2024)16. Another study by Chen et al. (2023) suggests that the 2021 flood caused 1,529 mass movements in headwater areas, including gullying, debris flows, and incision of ancient glacial and valley-fill deposits. Thus, a combination of extreme hydrometeorological conditions and cascading geomorphic processes in the Melamchi Valley unfolded as a multi-hazard disaster, largely due to multiple climatic and human-induced factors at different locations along the river system (Maharjan et al., 2021)[18]. Figure 2 below depicts the Melamchi river along the Helambu and Melamchi municipalities.

3.2. Cascading nature of the Melamchi river flood

On 15 June 2021, the Melamchi river experienced a catastrophic flood accompanied by debris flow, triggered by extreme rainfall and an outburst flood from a landslide dam. The incident triggered major destruction across Helambu and Melamchi municipalities, affecting infrastructure, livelihoods, cultural heritage, and the overall well-being of the communit (Figure 3). This flood disaster in June 2021 highlighted the dual challenge of mitigating loss that could have been prevented alongside those that were beyond human control.

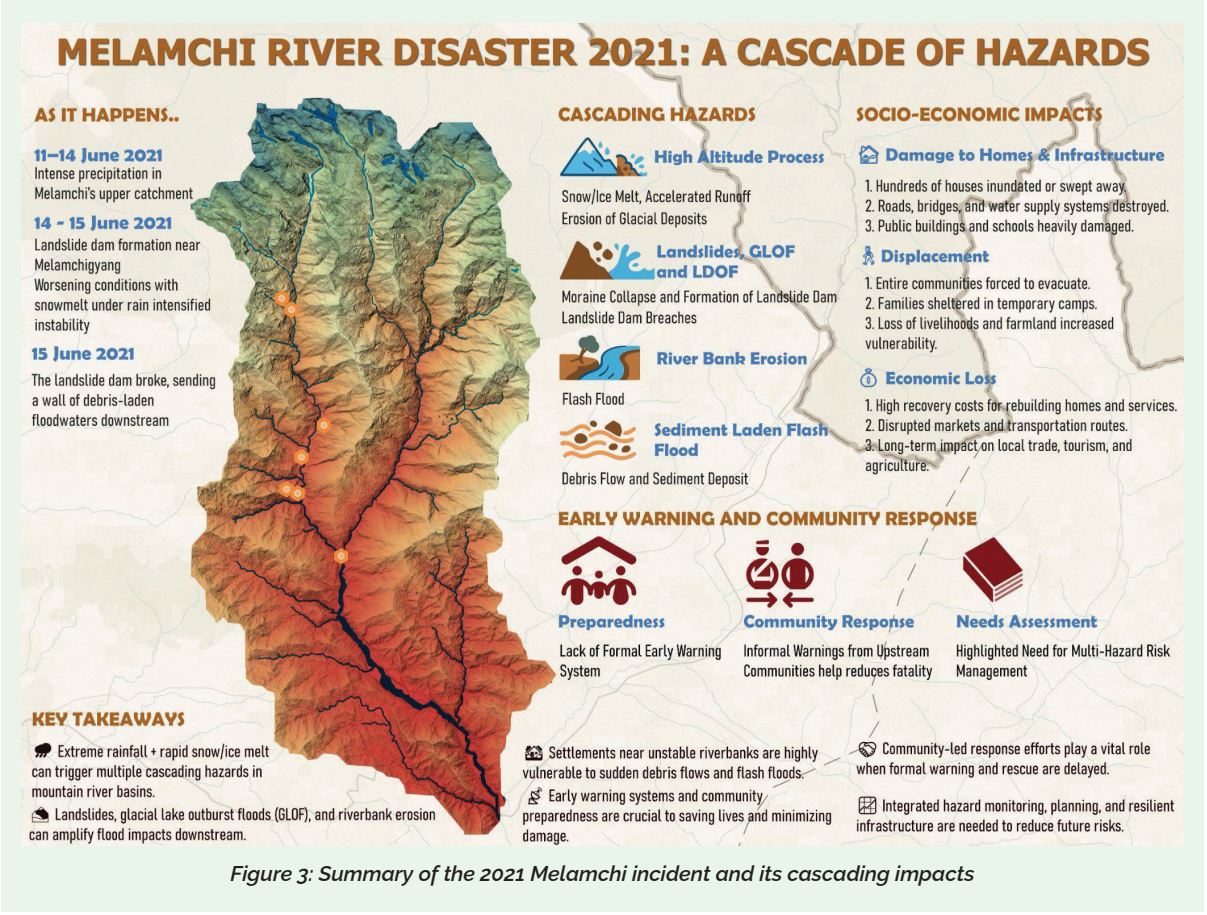


Figure 3: Summary of the 2021 Melamchi incident and its cascading impacts

The flood incident represents a cascade of interconnected hazards initiated by intense rainfall between 11 and 14 June 2021 and rapid snow and ice melt in the upper catchment. Prolonged heavy precipitation triggered multiple landslides, leading to the formation of a temporary dam

between 14 and 15 June. The subsequent breach of this dam on 15 June released a massive, sediment-laden flash flood downstream (Maharjan et al., 2021)[19]. This sequence of high-altitude processes and interactions, including landslides, glacial lakes, landslide dam outburst floods (LDOF), riverbank erosion, and debris flow, resulted in extensive erosion of glacial deposits, severe infrastructure damage, and widespread sediment deposition downstream.

A study by Adhikari et al. (2023)[20] attributes of the cascading Melamchi river flood to increasing climate variability, noting that rising temperatures have accelerated glacial melt while intensifying precipitation patterns. Model-based estimates indicate that an upstream discharge during the LDOF event reached approximately 9,033.6 m^3/s. On 11 June alone, hourly rainfall increased by 37 mm, while daily totals exceeded 100 mm at Sermathang (Maharjan et al., 2021)[21]. This extreme rainfall, combined with rapid snowmelt, destabilised loose glacial and permafrost deposits in the upper catchment, and likely triggered the breach of a small moraine-dammed lake. The resulting surge of water, boulders, and sediment travelled downstream to Bhemathang, where large volumes of debris accumulated. In the absence of formal early warning systems, information about the floods was shared primarily through informal phone calls from upstream communities. This communication, though helpful, was largely untimely and uncoordinated, limiting households' ability to protect their assets and reduce loss (PRC, 2025)[22].

3.3. Economic Loss and Damage: A Locally Led Assessment of Loss and Damage

The 2021 Melamchi river flood caused extensive destruction across Helambu and Melamchi municipalities, affecting particularly Melamchi Bazaar. The flash flood resulted in 5 deaths and 20 missing persons along with heavy damage to the Melamchi water supply project and road access (Maharjan et al., 2021)[23]. Other economic L&D include impacts on infrastructure, agriculture, education, businesses, tourism, and livelihoods. Among these, infrastructure damage and landloss were particularly severe, resulting in large-scale economic disruptions. Many households in the region rely on agriculture, trade, and tourism, and consequently lost their primary income sources.

Survey data of 120 households indicate that most respondents experienced loss to agricultural land, seasonal crops, and livestock. Furthermore, 53% of surveyed households reported a loss of agriculture-related income, indicating a long-term impact on their main sources of livelihoods. Key local income streams, such as rice cultivation, trout farming, and tourism, were significantly affected, illustrating the cascading impacts of infrastructure damage and land degradation. According to respondents, the highest economic loss was owing to damages to land (33%), followed by houses (25%), crops (18%), livestock (12%), fisheries (1%), and other loss (11%). On average, each affected household in Helambu lost 0.183 hectares of land, while households in Melamchi lost an average of 0.259 hectares.

In many cases, productive land was either washed away or converted into unstable riverbanks. The loss of crops, livestock, and irrigation facilities led to temporary food insecurity and reduced income. Land loss due to sedimentation has emerged as a long-term challenge that

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[19]*Sudan Bikash Maharjan, J. F. S. (2021). The Melamchi flood disaster: Cascading hazard and the need for multihazard risk management. International Centre for Integrated Mountain Development (ICIMOD). https://doi.org/10.53055/ICIMOD.981*

[20]*Adhikari, T.R., Baniya, B., Tang, Q., Talchabhadel, R., Gouli, M.R., Budhathoki, B.R., Awasthi, R.P. (2023). Evaluation of post extreme floods in high mountain region: A case study of the Melamchi flood 2021 at the Koshi River Basin in Nepal. Natural Hazards Research, 3(3). 437- 446.*

[21]*Sudan Bikash Maharjan, J. F. S. (2021). The Melamchi flood disaster: Cascading hazard and the need for multihazard risk management. International Centre for Integrated Mountain Development (ICIMOD). https://doi.org/10.53055/ICIMOD.981*

[22]*SPrakriti Resources Centre (PRC). (2025). Loss and Damage Booklet: Nepal.*

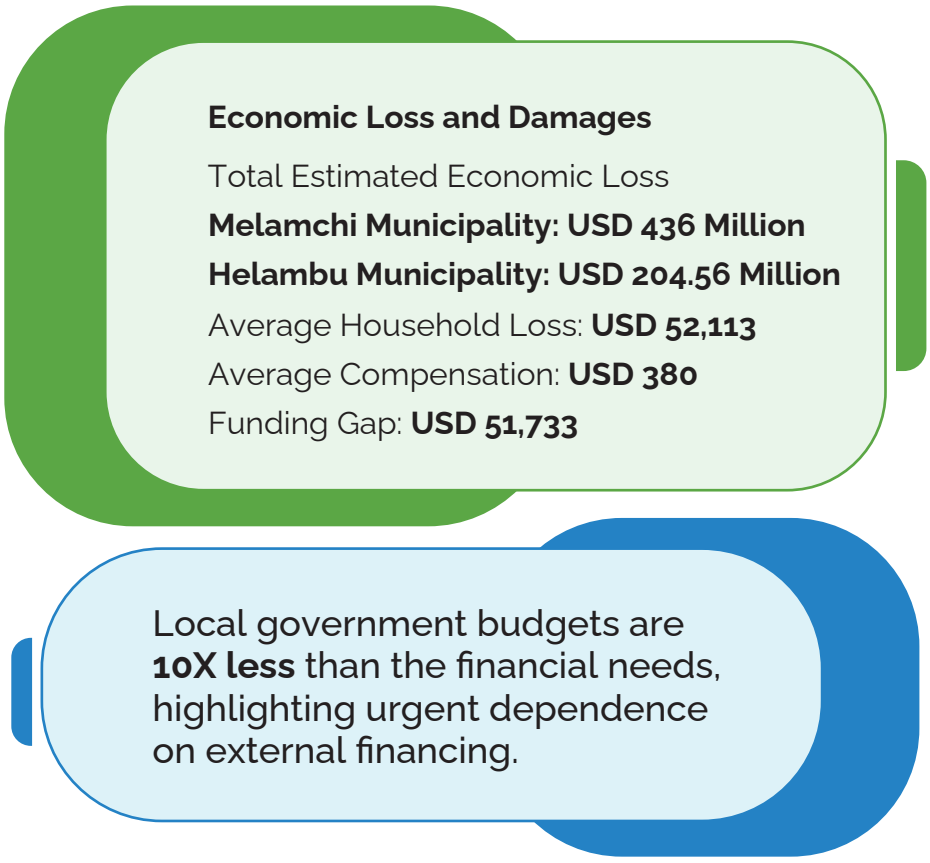
[23]*Sudan Bikash Maharjan, J. F. S. (2021). The Melamchi flood disaster: Cascading hazard and the need for multihazard risk management. International Centre for Integrated Mountain Development (ICIMOD). https://doi.org/10.53055/ICIMOD.981*

extends beyond immediate economic valuation, carrying significant environmental implications alongside the direct monetary value of land. Many households not only lost cultivable land but also experienced soil degradation, rendering remaining land unsuitable for future agricultural production.

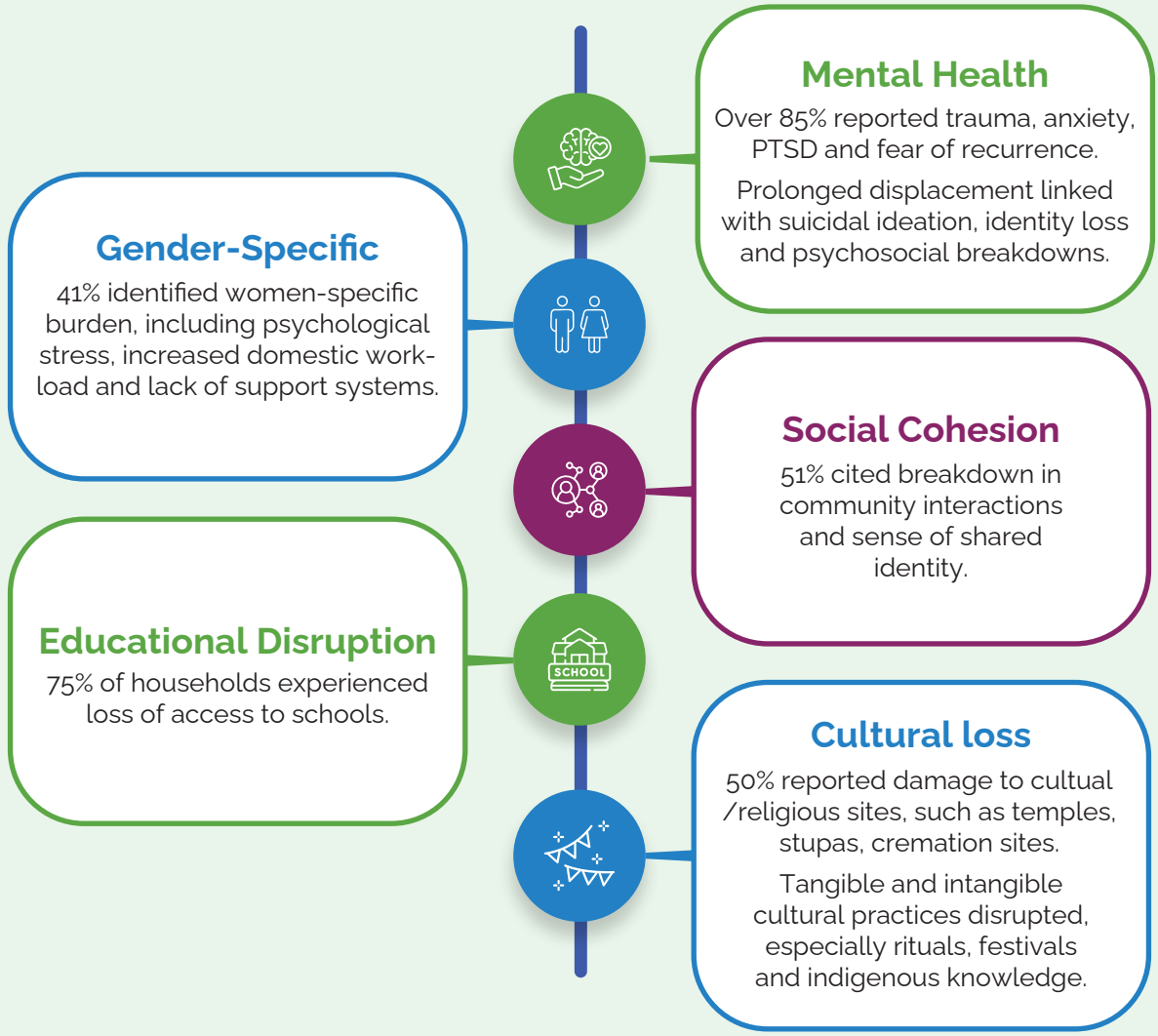
Owing to the damage, businesses, shops, and hotels in Melamchi Bazaar and surrounding areas were forced to close. The collapse of bridges and roads not only obstructed mobility but also restricted access to essential services and commercial activities. Additional loss included damage to agricultural and livestock enterprises, wholesale and retail businesses, hotels, and household assets such as beds, clothing, jewellery, refrigerators, and private vehicles.

An earlier study by PRC estimated that each affected household incurred an average economic loss of USD 52,113, with loss ranging from USD 91 to USD 408,383. However, households received an average of USD 380 in government support, with assistance ranging from USD 76 to a few up to USD 3,800, leaving a substantial gap. The residual loss was therefore estimated at USD 51,733 per household.

In Melamchi municipality, the total estimated financial loss for houses, land, and livestock was approximately USD 436 million. Similarly, in Helambu rural municipality, the total economic loss was estimated at USD 204.56 million (Figure 4). By comparison, the annual budgets of these municipalities in 2022 were significantly lower, amounting to USD 10.5 million and USD 3.8 million respectively. This stark gap between estimated loss and available budgets underscores the urgent need for external financial assistance, particularly through international funding mechanisms, to address loss and damages, support comprehensive recovery, and strengthen long-term resilience in the region.



Non-Economic Loss and Damage



Systemic and Institutional Gaps

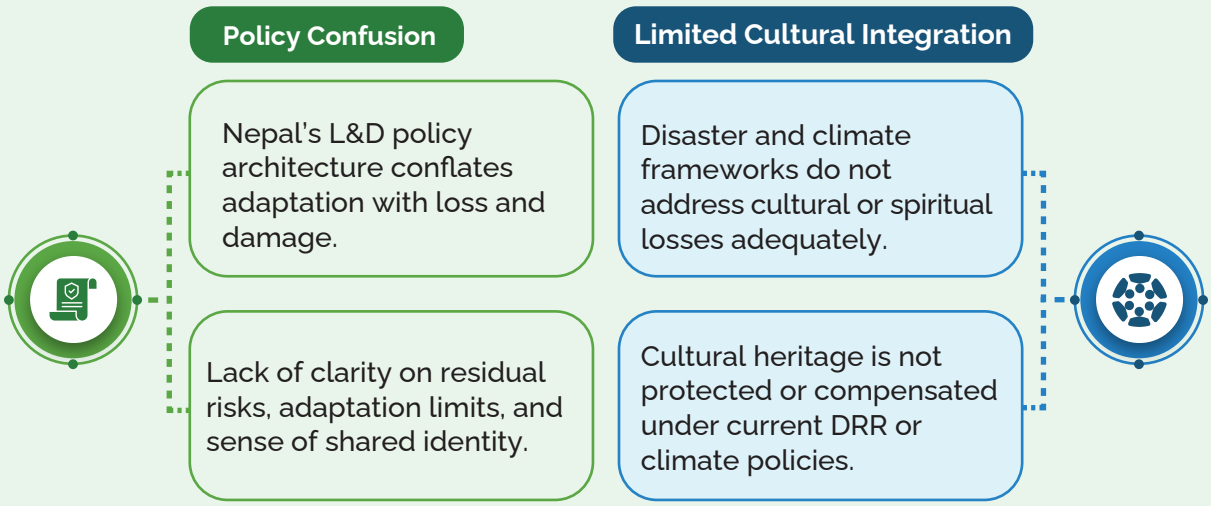


Figure 4: Infographics for the losses and damages incurred in the 2021 Melamchi river flood

3.4. Non-Economic Loss and Damage: A qualitative investigation into Cultural loss and a grounded analysis of Psychosocial impacts

The 2021 Melamchi river flood is often remembered for its economic impacts; however, its deeper non-economic consequences remain largely overlooked. Beyond visible physical destruction, affected communities experienced profound loss of cultural heritage, including temples, stupas, cremation grounds, collective identity, spiritual practices, and psychological wellbeing. In Chanaute, the entire village was destroyed and residents were displaced, disrupting festivals, rituals, and communal gatherings that had long sustained social cohesion and shared identity. These forms of non-economic loss and damage are highly context-specific, shaped by local meanings and belief systems, and are therefore difficult to quantify.

In Helambu and Melamchi, cultural and psychosocial impacts emerged as some of the most significant forms of non-economic loss and damage. The destruction of cultural heritage, discotinuation of religious festivals, and fragmentation of cultural life, alongside widespread trauma, anxiety, sleep disturbances, and fear of future floods, underscore the need to better understand these often-neglected aspects of loss and damage in Nepal. Recognising these impacts, PRC published an in-depth study examining how the flood and its aftermath affected cultural practices and the psychological well-being of communities in Melamchi and Helambu (Rai, 2025)[24].

Key findings from the study are presented below:

a. Living with Loss: Psychosocial impacts

Results from the DASS-21 survey reveal severe psychological toll. Nearly 70% of participants reported experiencing signs of depression, most commonly at moderate severity levels. Over half (57.1%) met the threshold for anxiety, with 23.8% falling within the severe to extremely severerange, while 28.6% reported mild-to-moderate stress. Together, these findings point to a persistent un dercurrent of emotional distress within affected communities.

These results indicate that while acute stress may subside following the initial shock of displacement or disruption, depression and anxiety often persist long after physical damage has been addressed. The situation was particularly acute for residents living close to riverbanks, whose anxiety levels reportedly increased by 93% after the floods.

This distress reflects cumulative exposure to overlapping crises, including the 2015 earthquake, the COVID-19 pandemic, the 2021 flood, and subsequent recurrent flooding. These events have been compounded by rising debt, forced migration, uncertain futures, and limited access to support systems. Personal narratives collected during the study illustrate how these pressures accumulate into long-term psychological trauma.

In Melamchi and Helambu, many communities described being trapped in a “loop of suffering”, repeatedly cycling between disaster and recovery. One respondent recalled her child experiencing sato gako, which translates from Nepali to “a state of intense, paralysing fear” in English, during the flood. Another shared that her daughter had lost interest in school and instead preferred to work to help support the family. The loss of ancestral homes and agricultural land ruptured generational

[24]*Rai, S. (2025). Bringing non-economic loss and damage (NELD) to the center of disaster governance in Nepal. Policy Brief. Prakriti Resources Centre.*

identity and pushed households into debt As one elderly man explained, “This wasn’t just a house; it was my ancestors’ home.”

> **This wasn’t just a house; it was my ancestors’ home.**

Another respondent said, “The house I worked so hard to build still had an unpaid loan, and now I am in debt for this new house too.”

> **The house I worked so hard to build still had an unpaid loan, and now I am in debt for this new house too.”**

The psychological burden of the disaster is also deeply gendered. Women, who often remain behind when men migrate for work, have assumed central roles in coping and preparedness. “I always keep an emergency bag ready now, with documents, clothes, food everything we might need if the flood reoccurs,” one woman shared. However, this constant state of preparedness has produced “resilience fatigue”, the exhaustion of repeatedly preparing to flee and rebuilding lives without meaningful institutional support. This fatigue should not be understood as a weakness but rather as a symptom of prolonged, unsupported strain.

> **I always keep an emergency bag ready now, with documents, clothes, food everything we might need if the flood reoccurs,” one woman shared.**

Four years after the flood, psychosocial wounds remain largely unhealed. These impacts are not isolated incidents, but part of a persistent cycle sustained by silence and neglect. Recovery frameworks continue to prioritise visible physical damage, leaving less tangible emotional and psychological harms insufficiently addressed. For recovery processes to be both just and transformative, mental and emotional well-being must be recognised as central to loss and damage responses. Without this shift, recovery remains incomplete, and justice remains out of reach.

Psycolosocial Toll Of 2021 Flood: DASS-21 Results

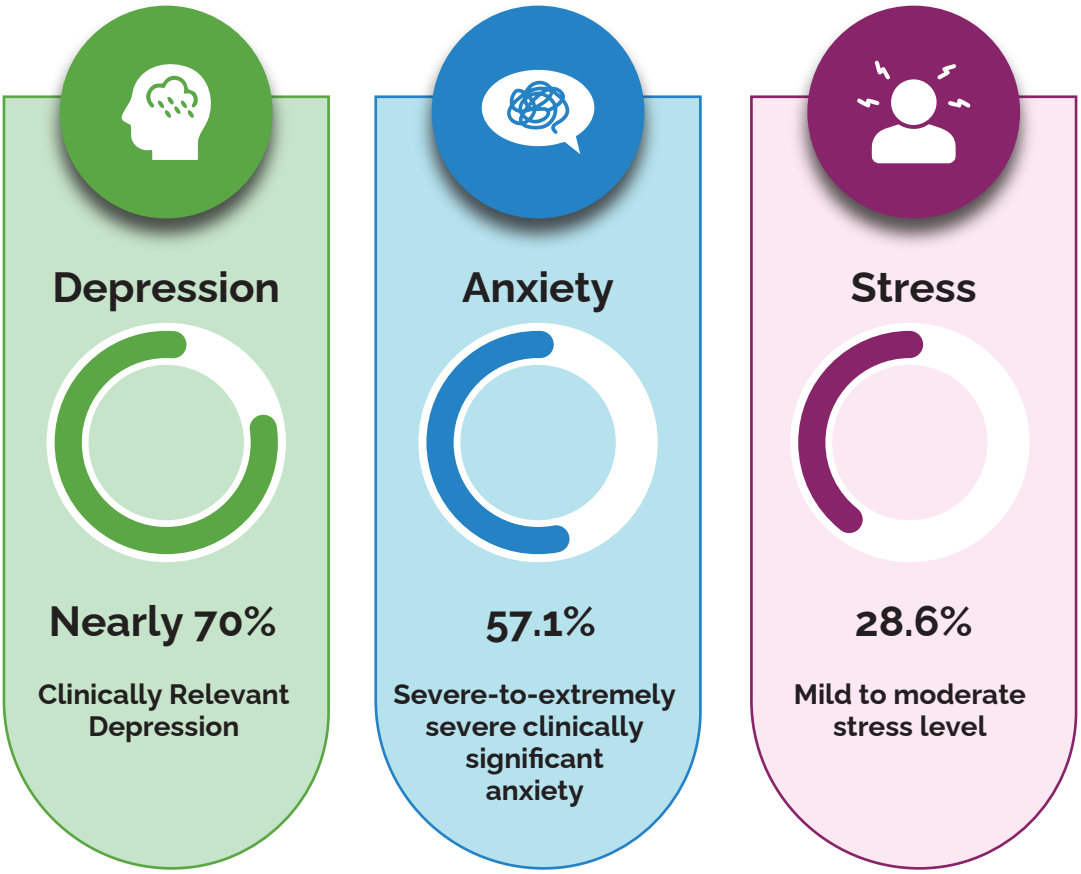


Figure 5: Psychosocial Toll of 2021 Flood: DASS-21 Results

b. Living with Loss: Cultural impacts

The 2021 flood revealed the deep interconnections between tangible and intangible cultural heritage, as the loss of temples, stupas, cremation sites, and communities accelerated the erosion of rituals, festivals, and collective identity.

Sacred sites such as the Indreshwar Mahadev Temple, the Seto Mane stupa, and Chanaute Bazaar once central spaces for worship, social gathering, and livelihoods suffered extensive damage, including the destruction of funeral shelters, cremation sites, and community halls. As communities were displaced, the ritual cycles that sustained spiritual and social life were disrupted. The loss of cremation sites left families unable to perform dignified last rites, while festivals like Teej, Buddha Jayanti, and Shivaratri were increasingly observed in private spaces due to displacement, trauma, and livelihood pressures, weakening their communal significance.

For the Majhi communities in particular, the flood intensified an already fragile shift away from their traditional fishing-based livelihoods. What remained was not just physical ruin but a deep rupture in in cultural continuity, belonging, and identity, as older generations expressed concern over the younger generation's growing disconnect from ancestral cultural practices.

Box A: Loss of sacred funeral spaces

Cremation site washed away by the 2021 Melamchi river flood

Cremation sites along riverbanks near temples have served as the final resting place for generations. Deeply rooted in Hindu customs, these sacred grounds are more than physical locations: they are spaces where fire i believed to purify the soul, and scattering ashes into the river symbolises the release and spiritual cleansing of the deceased. These sites have been carefully chosen over generations for cremation rituals. While some temples remained intact after the flood, essential funeral infrastructure, including cremation platforms (ghāṭas), mourning houses (kriyāghars), and funeral shelters (masāne pāṭīs), was swept away. These spaces once supported not only grieving families but also the collective rhythms of ritual and remembrance. Their loss has significantly affected how communities process death, as designated cremation spaces that were carefully maintained prior to the disaster were destroyed.

The destruction of kriyāghars, particularly for economically disadvantaged families, was deeply felt. These spaces enabled the performance of the 13-day mourning ritual, offering shelter, privacy, and communal care. In the absence of these houses, many families have had to resort to holding ceremonies in private homes. As one elderly resident noted, "Even death has become uncertain; rituals feel incomplete, and the grieving process is fragmented."

Despite these challenges, communities are beginning to adapt. Survivors have constructed makeshift platforms, repurposed remnants of old spaces, and reimagined ritual practices to accommodate post-flood realities. These adaptations reflect both resilience and quiet grief, serving as a testament to the persistence of cultural continuity even profound disruption.

Amid the loss, resilience emerged as communities adapted practices, relocated rituals, and pooled household contributions to revive ceremonies and festivals. Youth groups reintroduced traditional music and songs, while cultural committees worked to safeguard local culture and traditions (Boxes A and B). These efforts demonstrate cultural resilience, even as formal recovery frameworks often overlook the emotional and cultural dimensions of loss. The findings underscore that culture is central to recovery, weaving the social fabric that holds people together. Unless cultural loss is recognised as a critical dimension of NELD, recovery will remain incomplete, focused only on material reconstruction.

Box B: Reclaiming rhythm: Youth-led cultural revival through music

Youth kick off dhimay baja

As the cultural landscape of the Melamchi Valley grappled with silence, a group of young people began the quiet work of revival through rhythm. The Hamro Team Melamchi Group, with support from Melamchi municipality, received five dhimay bājās (traditional Newar drums) and a jhyāli (cymbal), and enlisted a music teacher from Thimi to guide their learning. On the first day prior to starting the lesson, the young gathered at the Indreshwar Mahadev Temple to worship Nṛtyeśvara, the deity of dance and music, before striking the drums. This spiritual and symbolic act reflected more than a return to musical practice: it represented a community's effort to reclaim cultural space, reanimate tradition, and restore the sounds that once echoed through festivals and celebrations.

At a time when many cultural structures remain in ruins, this act of musical revival embodies resilience. Healing, in this context, comes not only through rebuilding physical infrastructure but also from reawakening the intangible threads of identity that sustain communities.

c. Cascading socio-structural issues

The Melamchi river flood has triggered cascading socio-structural challenges, with interconnected impacts that exacerbate non-economic loss and damage. Consultations revealed that many households have migrated to cities or abroad for work, leaving children and the elderly behind. This has contributed to an increasing school dropout rate among children. Women's burdens have also intensified, with increased workloads, greater drudgery, and heightened psychosocial stress.

Participants also highlighted how loss and damage have disrupted local businesses and trade, increased households' financial burdens, and contributed to family breakdowns and other social problems. For example, one respondent reported a sharp decline in the value of his land, which disrupted his plans to sell it to fund his children's education.

4. Legal and Policy mandates and Institutional mechanisms for inter-agency coordination on responding to loss and damage

The previous section highlighted the scale and severity of economic and non-economic L&D in Melamchi and Helambu, underscoring the importance of recognising their different dimensions. This section organises the findings around existing policy and institutional mechanisms at the federal, provincial, and local levels, and examines their implications for economic and non-economic loss and damage.

4.1. Legal and Policy provisions on responding to loss and damage

4.1.1. Responsiveness of Local and Provincial Policies and Plans

The Act on Environment and Natural Resource Conservation by Melamchi municipality (2019)[25] authorises the executive body to create adaptation plans to reduce climate change risks, with priority given to vulnerable groups, including women, dalits, minorities, children, the elderly, people with disabilities, and the economically disadvantaged. All adaptation efforts and project plans must be developed according to national standards, prioritising the management of climate-related risks and adverse effects. Similarly, the provincial Disaster Risk Reduction Act and guidelines, namely the Bagmati Provincial Disaster Management Act (2018) and the Provincial Disaster Management Policy (2019)[26], clearly outline the policy direction and legal mandate for disaster response and rehabilitation. However, they provide little guidance on preparedness and on building back better.

Table 1 below provides an analysis of policy provisions of various provincial and local policies and plans regarding economic loss and damage, particularly incentives mechanisms. These policy provisions show that economic loss and damage are partially addressed in various climate and disaster acts and policies at the federal, provincial, and local levels. Incentive and compensation mechanisms in terms of relief and rehabilitation are primarily covered under disaster-related acts and policies. Existing provisions focus largely on rapid relief for housing damage, fatalities, and immediate household needs, while economic loss critical to livelihoods, such as agricultural

land, crops, livestock, and productive assets, are minimally recognised or excluded from compensation frameworks. Furthermore, according to government officials, in practice, not all aspects of economic loss and damage are accounted for: major reporting tends to cover only personal fatalities, loss to agriculture and livestock, and damage to major infrastructures. Loss affecting a wider range of crops, smaller infrastructure, and other private and public assets are often unreported.

[44]*Government of Nepal. (2021). National Disaster Risk Financing Strategy. Ministry of Home Affairs. National Disaster Risk Reduction and Management Authority (NDRRMA).*

Table 1: Provincial and Local-level Policy provisions on Economic loss and incentive modalities

Policy / Instrument	Scope and Intent	Types of Economic Loss Covered	Compensation Amount/ Modalities
Local-level Disaster Risk Management Acts (e.g., Disaster Risk Management and Climate-Resilient Municipal Development Act, 2018 of Melamchi):	Supports municipal-level disaster governance and climate resilience building/s		
Melamchi Disaster Management Fund (Operation) Procedure, 2021	Establishes a dedicated local financing mechanism for emergency response and compensation	Immediate relief and housing damage	Largely mirrors national compensation provisions
District Disaster Preparedness and Response Plans (DPRP) and Local DRRM Plans (Melamchi)	Facilitate context-specific disaster preparedness, response, and recovery planning at district and municipal levels	Housing damage; limited livestock loss; immediate emergency relief	NPR 15,000 for fully destroyed houses; NPR 10,000 for partially damaged houses; NPR 10,000 for a milking cow; emergency disbursement up to NPR 50,000 (immediate) and NPR 500,000 (response)
		Varies by locality; generally aligned with national relief standards	No separate or guaranteed compensation ceilings beyond national guidelines

The policy requiring the demolishing of disaster-damaged houses before eligibility for new housing has been controversial. An official from Melamchi stated:

> "In my view, the criteria that require people to demolish their old, damaged houses are not fair. It seems like people are being forced to seek compensation only after destroying what little they have left. Since demolishing a house itself is expensive, how can people afford to request compensation if they must spend so much money just to tear it down?
> I believe people should be allowed to build new houses without having to demolish the old ones."

In terms of economic loss and damage from operational issues, agricultural land loss has been a persistent problem in Melamchi and Helambu, both during the 2021 flood and recurring monsoon floods since. A local official said

> "The community constantly raises concerns about the loss of agricultural land and the washing away of ancestral lands. Complaints are regularly brought to us, but what can we do? There is no provision for compensation for agricultural land loss in our local-level procedures, and I don't think it's included in national procedures either."

However, non-economic loss, including loss of cultural heritage, social cohesion, psychosocial well-being, and place-based identity, are largely absent from these policies. Based on the policy analysis presented in Table 2, it can be concluded that there is a stronger focus on recognising economic loss and damage, which forms the basis for relief, rehabilitation, and other incentive mechanisms. This narrow perspective has direct consequences in disaster contexts, such as the Melamchi river floods, where extensive land degradation and livelihood loss resulted in both long-term economic and non-economic harm that remained legally uncompensated.

Table 2: Provisions within Provincial and Local policies related to Non-economic loss and damage

Policy/Procedure	Non-Economic Loss and Damage Provision
Melamchi Disaster Management Fund (Operation) Procedure, 2021	Provide psychological treatment and counselling for disaster-affected populations; clean up the waste and pollution caused by the disaster
Provincial disaster law and policies (e.g., Province Disaster Management Policies and Strategic Action Plan, Bagmati Province 2019-2030)	Establishment of trauma centres; protection of social sites, vulnerable ecological areas, and cultural heritage

The operational aspects of addressing non-economic loss and damge, as outlined in these policies and plans, are highly problematic. Although the DRR Act and municipal procedures of Melamchi formally mandate psychosocial counselling, local consultations revealed that only one counsellor was deployed, and that was through a separate labour migration project, not via the National Disaster Risk Reduction and Management Authority's (NDRRMA) disaster response channels. There is no operational guidance for addressing the psychosocial well-being of the broader population as part of disaster response.

This lack of psychosocial support mechanisms points to a deeper policy limitation: disaster recovery frameworks in Nepal remain focused on physical reconstruction rather than human recovery. The Melamchi example underscores the need to redefine "recovery" to go beyond physical rebuilding and recognise psychosocial well-being as a vital component of loss and damage response.

4.1.2. Responsiveness of National Policies and Plans in relation to disasters like the Melamchi river flood

At the national level, the Government of Nepal has introduced various policies and strategies addressing climate change and disaster risk reduction. Climate change efforts are primarily guided by the Environment Protection Act (2019)[27] and the National Climate Change Policy (2019). Similarly, disaster risk reduction and management are governed by the Disaster Risk Reduction and Management Act (2017)[29], along with the National Disaster Risk Reduction and Management Strategy and Action Plan (2018) and Local Governance Act (2017)[31].

Nepal's climate and disaster risk management framework comprises several key policies and legal instruments that address aspects of L&D. The Environment Protection Act (2019) establishes a legal mandate to address the impacts of climate-induced disasters, with particular attention to vulnerable populations. In terms of policy direction on climate change, the National Climate Change Policy (2019) provides a broad foundation for addressing climate impacts, often incorporating L&D within its primary objectives. The National Framework on Climate-Induced Loss and Damage (2021)[32] provides a direct approach to tackling climate-induced L&D. Likewise, the Disaster Risk Reduction and Management (DRRM) Act of 2017 and its Regulation of 2019 form the primary legal basis for disaster response, relief, and rehabilitation, essential for addressing L&D, while the National Policy for Disaster Risk Reduction (2018) guides the implementation of DRRM initiatives. At the federal level, Nepal has an integrated set of instruments that recognise L&D, providing entry points for both economic and non-economic impacts.

Specifically, the national framework on L&D highlights the need to enhance the National Framework on Climate Change-Induced Loss and Damage to ensure comprehensiveness (including non-economic as well as hazard-specific loss and damages) and to establish a robust implementation mechanism. Likewise, the National Climate Change Policy (2019), Nationally Determined Contributions (2025)[33], and the National Adaptation Plan (NAP 2021–2050)[34] promote research, assessment, and mainstreaming of climate impacts across sectors, encouraging mesures to reduce climate-driven loss in areas such as agriculture, infrastructure, and livelihoods. Although adaptation plans such as the National Action Plan (NAP) are crucial for their interlinkages with L&D, the current NAP refers to L&D in only three areas, focusing on infrastructure and health. This represents a significant missed opportunity to fully integrate L&D considerations across sectors.

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[27] *Government of Nepal. (2019). Ministry of Forests and Environment. The Environment Protection Act, 2076 (2019). https://www.mofe.gov.np/content/62/environment-protection-ann--2076/*
[28] *Government of Nepal. (2019). Ministry of Forests and Environment. The Environment Protection Act, 2076 (2019). https://www.mofe.gov.np/content/62/environment-protection-ann--2076/*
[29] *Government of Nepal. (2019). Ministry of Forests and Environment. National Environment Policy, 2076 (2019). https://www.mofe.gov.np/content/34/national-environment-policy--2076/*
[30] *Government of Nepal. (2018). National Policy for Disaster Risk Reduction 2018. http://drrportal.gov.np/uploads/document/1476.pdf*
[31] *Government of Nepal. (2017). (2017). स्थानीय सरकार सञ्चालन ऐन, २०७४ [Local Government Operation Act, 2074]. Ministry of Federal Affairs and General Administration. https://mofaga.gov.np/detail/1697*
[32] *MoFE. (2021). National Framework on Climate Change Induced Loss and Damage (L&D). Ministry of Forests and Environment, Government of Nepal. Kathmandu, Nepal.*
[33] *Government of Nepal. (2025). Nationally Determined Contribution (NDC) 3.0. Ministry of Forest and Environment*
[34] *Government of Nepal, 2021. National Adaptation Plan of Nepal. Singhdurbar, Kathmandu Nepal*

Likewise, the DRRM Act outlines processes for disaster prevention, relief, compensation, and recovery, thereby addressing various types of economic L&D and providing administrative compensation mechanisms. Meanwhile, the National Framework on Climate-Induced Loss and Damage guides the assessment, classification, and governance of L&D, explicitly recognising non-economic L&D, such as damage to cultural sites, displacement, loss of identity, and psychosocial harm, and linking L&D assessment to planning and financing.

Table 3 below provides an analysis of policy provisions in various national policies and plans regarding economic L&D, particularly focusing on incentive mechanisms.

Table 3: National Policy Provisions on Economic loss and incentive modalities

Policy / Instrument	Scope and Intent	Types of Economic Loss Covered	Compensation Amount/ Modalities
National Climate Change Policy, 2019	Provides policy directives on climate financing	Not specified	Mentions that 80% of funds received from external sources for adaptation are spent at the local level
Disaster Risk Reduction and Management (DRRM) Act, 2017 (1st Amendment); DRRM Rule (2nd Amendment), 2019; DRR National Policy, 2018	Establishes national and sub-national disaster institutions (NDRRMA, committees, funds) and provides legal basis for relief, compensation, and livelihood support	Housing damage; death and injury; minimum household relief; compensation for requisitioned land with harvests (in principle); livelihood support through self-employment or income generation	Relief-oriented compensation; no clear valuation or entitlement mechanisms for livelihood losses
Standards for Disaster Victim Rescue and Relief, 2020	Operational framework detailing standard amounts and procedures for immediate rescue and relief	Immediate household relief; death compensation	NPR 15,000-20,000 per affected household; NPR 200,000 per death
Disaster-Affected Private Housing Strengthening, Reconstruction,and Resettlement Grant Procedure 2081 (1st Amendment)	Provides guideline for grants to disaster-affected private housing	Strengthening, reconstruction and reconstruction grants	Category A district: NPR 500,000; Category B district: NPR 400,000; Category C: NPR 300,000 (paid in three instalments for all categories)

In terms of policy provisions on non-economic L&D, national policies partially address certain aspects, with greater emphasis on protecting cultural heritage and ecosystems. Nepal's Loss and Damage Framework (2021) explicitly identifies non-economic loss, including psychosocial well-being and cultural heritage.Additionally, the NDC 3.0 highlights the need to enhance the National Framework on Climate Change-Induced Loss and Damage to ensure comprehensiveness covering both non-economic as well as hazard-specific L&D and to establish a robust implementation mechanism. Table 4 outlines the provisions on non-economic loss and damage within national policies and plans.

Table 4: National-Level Policy provisions on Non-Economic Loss and Damage

Policies and Plans	Provisions
Nepal's Loss and Damage Framework, 2021	Recognises non-economic losses, including psychosocial well-being and cultural heritage
Nationally Determined Contributions 3.0, 2025	Aims to establish a robust implementation mechanism for non-economic loss and damage
DRRM Act, 2017, Standards, and Local Procedures (2019)	Focuses on risk assessment of cultural assets

Despite progress, significant policy gaps remain, particularly in compensating for livelihood assets damaged by disasters. The Disaster-Affected Private Housing Strengthening, Reconstruction, and Resettlement Grant Procedure (2081, First Amendment)[35] primarily addresses housing reconstruction by setting guidelines for collecting household- and local-level disaster impact data, but it focuses almost exclusively on compensation, relief, and rehabilitation for housing reconstruction, neglecting other livelihood and cultural assets. Loss of land, particularly productive agricultural land, and implications to business and trade are not included in the compensation, relief and rehabilitation guidelines and standards. Locals identify this as a major policy lapse and barrier to building households resilience.

4.2. Inter-Agency coordination on responding to Loss and Damage

4.2.1 Institutional structure at the Provincial and Local level

At the provincial level, the Provincial Climate Change Coordination Committee (PCCCC) was recently established, comprising representatives from the Federation of Urban Municipalities and the Federation of Local Municipalities. However, the composition and functioning of PCCCC structures vary across provinces. For example, Bagmati Province has ensured the participation of Indigenous groups, civil society, and municipal federations in its PCCCC. While the Ministry of Forests and Environment is mandated to address environmental and climate change issues, its specific responsibilities concerning loss and damage are not clearly defined.

[35]*Government of Nepal. (2078). Disaster Preparedness and Response Plan (DPRP) 2078 (model). https://www.dpnet.org.np/resource-detail/2078*
[36]*Government of Nepal (2019). First Amendment (2019) of the Disaster Risk Reduction and Management (DRRM) Act, 2017.*

The DRRM Act established both a Provincial Disaster Management Council (PDMC) and a Provincial Disaster Management Executive Committee (PDMEC) for each province[36]. The PDMC is chaired by the Chief Minister, while the PDMEC is led by the Minister of Internal Affairs and Law (MoIAL). Both bodies are responsible for coordinating and leading disaster response efforts.

At the municipal level, the DRRM Act requires each municipality to establish Local Disaster Management Committees (LDMCs). The Constitution and the Local Government Operationalisation Act (2017) allow local governments to develop their own DRRM Acts, based on a template from the Ministry of Federal Affairs and General Administration (MoFAGA)[37].These local acts also establish Ward Disaster Management Committees (WDMCs). Additionally, the DRRM Act maintains District Disaster Management Committees (DDMCs), chaired by the Chief District Officer and including local government heads, District Coordination Committee (DCC) members, and district-level vfederal officials.

The PDMCs, DDMCs, and LDMCs share three primary coordination responsibilities[38]:

Coordinating responsibilities at province, district and local level

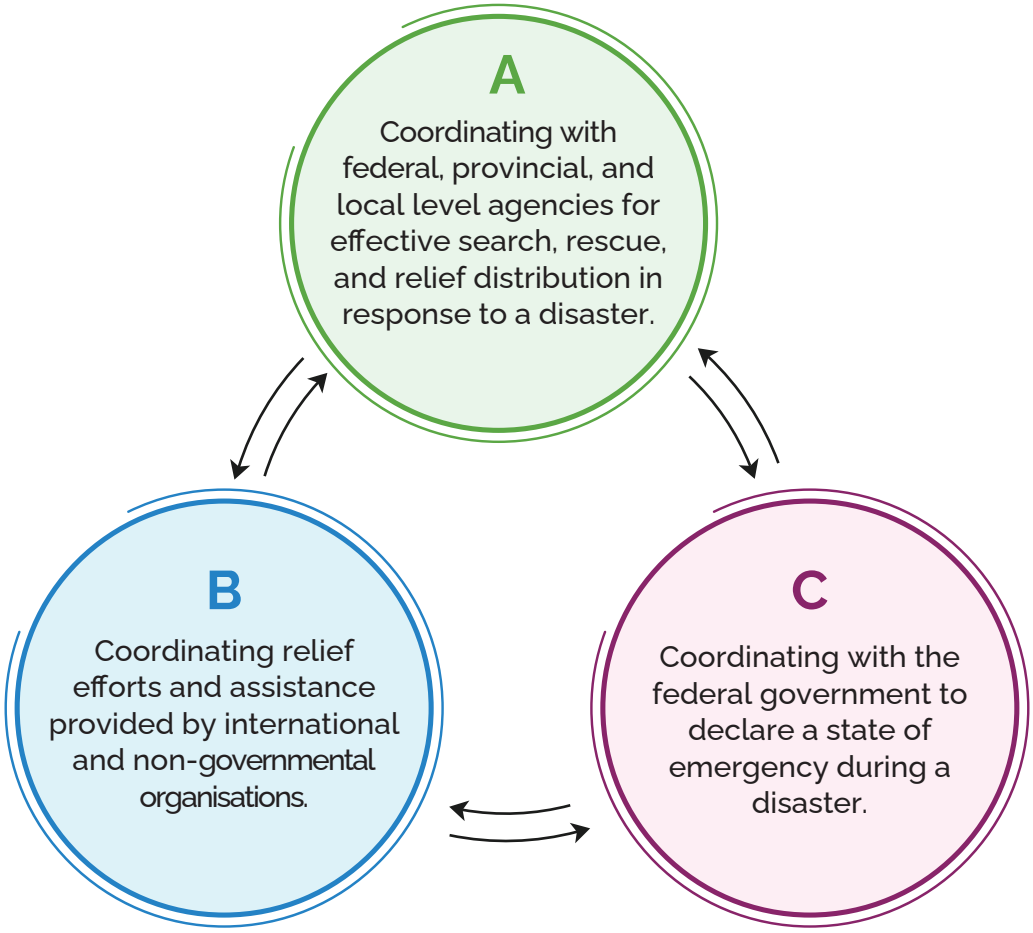

Figure 6: Coordinating responsibilities at province, district and local level

[37]*Government of Nepal.(2018). Model Act on Disaster Risk Reduction and Management (draft). Ministry of Federal Affairs & General Administration (MoFAGA).*
[38]*Section 2.1: Understanding the Jurisdiction in DRRM of the PEA Economy Analysis of DRRM*
[38]*Nepal, P., Khanal, N.R., & Pangali Sharma, B.P. (2018). Policies and Institutions for Disaster Risk Management in Nepal: A Review. The Geographical Journal of Nepal, 11, 1–24.*

Table 5 summarises the roles and responsibilities of provincial, district, and local-level climate and disaster management committees.

Table 5: Roles and Responsibilities of Provincial, District, and Local-Level committees[39]

Provincial Climate Change Coordination Committee (PCCCC)	Provincial Disaster Management Committee (PDMC)	District Disaster Management Committee (DDMC)	Local Disaster Management Committee (LDMC)
Coordinate between provincial and local governments to ensure climate change is integrated across the sectoral policies and plans	Implement disaster-related short- and medium-term policies, plans, and programmes at the provincial level	Implement policies, plans, and programmes approved by the council, executive committee, and province committee	Design and implement the local disaster management plan
Provide support to local governments to implement priority climate actions at the grassroots level	Facilitate and coordinate LDMC preparedness activities	Prepare and implement the District Disaster Response Plan	Allocate budgets for disaster risk reduction activities
Advise provincial and local government to devise necessary policy and guidelines	Coordinate with national, provincial, and local-level bodies to ensure the effectiveness of search and rescue operations	Mobilise the district emergency operations centre	Coordinate public, private, NGO, local volunteer participation in disaster management activities
	Manage essential supplies, such as drinking water, food, clothing, and medicines in disaster-affected areas	Conduct search and rescue operations in affected areas	Implement building codes & standards/ guidelines
	Facilitate the safe relocation of people from unsafe to safe areas during disasters	Manage essential supplies, such as drinking water, food, clothing, and medicines in disas-ter-affected areas	Form disaster preparedness committees at ward and community levels
		Maintain security forces and public order during disasters	Manage rescue and relief operations in affected areas
		Coordinate national and international assistance during disasters	
		Ensure timely flow of disaster-related information	

4.2.2. Institutional mechanisms for Interagency coordination at the National level

To ensure effective coordination, Nepal has established a multi-tiered institutional framework. At the highest level is the National Environment Protection and Climate Change Management Council, chaired by the Prime Minister. The council brings together federal ministers, the chief ministers from all seven provinces, and selected experts. Supporting this council is the Climate Change Steering Committee, chaired by the Minister of Forests and Environment, which comprises secretaries from key line ministries. Additionally, the Inter-ministerial Climate Change Coordination Committee, led by the Secretary of the Ministry of Forests and Environment, includes joint secretaries from relevant government agencies.

According to the Government of Nepal Allocation of Business Rules (2018) , the Ministry of Forests and Environment (MoFE) oversees climate response functions at the federal level. To facilitate localisation, MoFE leads the formulation of related policies, laws, and essential requirements under the United Nations Framework Convention on Climate Change (UNFCCC) processes. MoFE has a dedicated Climate Change Management Division (CCMD), which includes sections for adaptation, climate technology, mitigation, clean mechanisms, and emissions measurement. The CCMD acts as the central agency for climate change, leading the development of policies, plans, and programmes, coordinating their implementation with governmental and non-governmental organisations, and monitoring outcomes. It also serves as the UNFCCC focal point for Nepal.

An institutional analysis of the disaster management landscape shows that the Disaster Risk Reduction and Management Act (2017) outlines mechanisms at the federal, provincial, and local levels. Nationally, the National Council for Disaster Risk Reduction and Management (NCDRRM), chaired by the Prime Minister, directs disaster management policy and strategy. At the federal level, executive and expert committees can be formed to provide guidance, while management committees operate at the provincial and local levels to implement policies and coordinate response efforts.

Institutional landscape governing climate and disaster risk reduction and management.

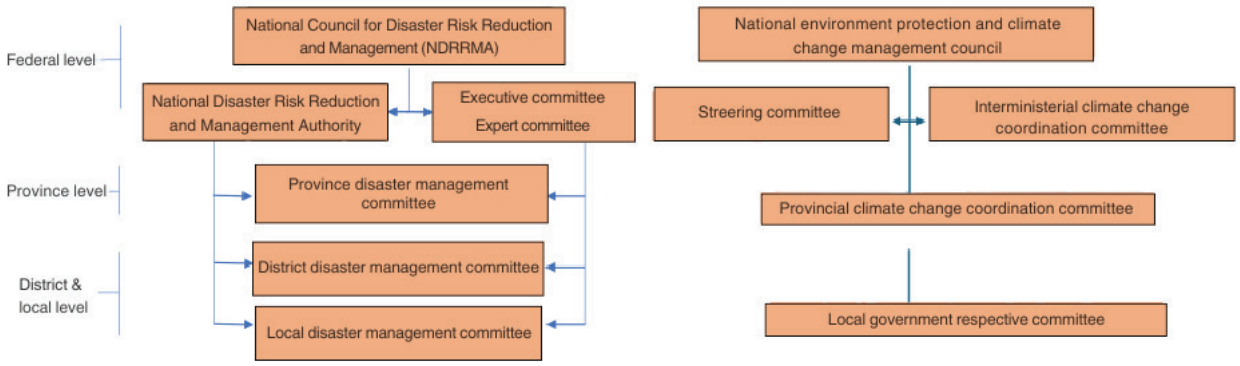

Figure 7: Institutional landscape governing climate and disaster risk reduction and management.

The National Council for Disaster Risk Reduction and Management (NCDRRM) oversees and approves all national disaster management plans and policies. The committee is chaired by the Prime Minister. The National Disaster Reduction and Management Authority (NDRRMA) serves as the secretariat of the NCDRRM and is headed by a Chief Executive. The NDRRMA is responsible for developing and implementing the plans, programmes, and decisions set by the NCDRRM. An Executive Committee of the NCDRRM, chaired by the Home Minister, directs DRRM policy and its implementation. Other key federal-level institutions for disaster management include the Ministry of Home Affairs (MoHA) and various Emergency Operations Centres (EOCs). Coordination is further strengthened through mechanisms such as humanitarian cluster groups, the National Disaster Response Framework (NDRF), and platforms that facilitate collaboration between government and non-government actors.

Local government officials have emphasised that clear legal mandates and well-defined roles are crucial to preventing policy obstacles. Regarding institutional responsibility for L&D, the MoFE is the designated UNFCCC focal agency and has proposed that the Climate Change Management Division (CCMD) take this role, as recommended by a cabinet decision. Nonetheless, the primary responsibility for addressing both economic and non-economic L&D rests with the NDRRMA under the DRRM Act. Neither the Environment Protection Act nor the National Climate Change Policy explicitly assigns MoFE as the primary agency for L&D response, although they reference climate-induced disasters. Furthermore, opinions differ on which institution should serve as the focal point for L&D, but the responsibility arguably aligns more closely with the Ministry of Home Affairs and NDRRMA.

4.2.3. Functionality of Local, Provincial, and Federal Committees during the Melamchi river flood

A review of the response by national and federal-level climate change coordination committees during the Melamchi disaster revealed critical gaps. The National Environment Protection and Climate Change Management Council was only activated in August 2022, nearly three years after its provision in the Environment Protection Act (2019). Since its activation, it has convened three times, yet none of the meeting records reference the Melamchi river flood. Similarly, the Interministerial Climate Change Council, established in 2019 under the National Climate Change Policy, met several times in 2021 and afterwards. While it supported the endorsement of the National Framework on L&D in 2021, its meetings did not address the Melamchi disaster response. Overall, there was little communication or functional collaboration between climate-focused institutional bodies and disaster committees at the national and provincial levels during the Melamchi river flood.

In contrast, the national disaster management committees demonstrated strong functionality and responsiveness during the Melamchi river flood emergency. Ahead of the June 2021 flood, the Executive Committee of the NCDRRM approved the Monsoon Preparedness and Response Action Plan ensuring readiness. On 16 June, 2021, the committee promptly resolved to provide relief to affected families. The committee also underscored the importance of a unified government programme addressing both short and long-term disaster preparedness and response, acknowledging the increasing severity of climate change-driven disasters. The National Disaster Risk Reduction and Management Authority (NDRRMA) also organised various national consultations, engaging development agencies, experts, and civil society organisations in develop coordinated strategies to respond to the Melamchi flood.

The local government was also slow to act. Local officials from Melamchi reported that its Disaster Management Committee became fully active only after the 2021 flood. However, since then, the local government has strengthened governance, coordination, and institutional capacity, helping to establish strong leadership, clear roles, and accountability for disaster management. This includes forming a disaster management and response task force, a dedicated rescue committee, and ward-level disaster management committees, while coordinating with other government bodies and experts. Cost-sharing arrangements with the NDRRMA and the Melamchi municipality were also implemented, for instance, to protect

bridges. According to local government meeting minutes, the Melamchi municipality also carried out risk assessments, studies, and evidence generation. Expert teams for on-site studies of floods and landslides, employed drones to produce detailed footage to bolster reports, conducted geological studies of 48 high-risk sites, and analysed river control measures, settlement reconstruction, and related issues, collecting necessary data and statistics. The municipality also strengthened its information systems and knowledge management by operating a disaster portal and installing early warning systems to support transparent, data-driven decision-making.

Table 6 below summarises Melamchi municipality's core areas of decisions since the 2021 flood. Most decisions still focus on traditional humanitarian action, especially emergency response and relief; recovery and social protection; and providing evacuation services, temporary shelters and cash relief. However, there is a strong and growing emphasis on resilience building, reflected in key areas such as preparedness and risk reduction; river management and critical infrastructure protection; resettlement, relocation and land management, and reconstruction; and long-term resilience building. Overall, the municipality's portfolio is gradually shifting from a response-heavy approach toward a more balanced strategy, with roughly half of the actions now contributing directly to long-term resilience rather than only short-term humanitarian relief[41].

Table 6: Major Decisions taken by Melamchi municipality in response to the flood

Key Areas	Decisions of the municipality
Preparedness & Risk Reduction	Actions taken before or between disasters to reduce future risk, including pre-monsoon preparedness activities; community-based early warning system project; simulation/drill exercises for disaster events; and management of disaster-related materials and equipment
Emergency Response and Life-Saving Actions	Immediate actions during and immediately after disasters, including observation of high-risk houses and evacuation of residents; and arrangement of temporary shelter in school buildings
Relief, Recovery and Social Protection	Short- to medium-term support for affected populations, including provision of cash relief packages; preparation and submission of beneficiary schedules to the DDMC; and protection/preservation of flood-damaged structures
River Management and Critical Infrastructure Protection	Physical interventions to stabilise rivers and protect connectivity
Resettlement, Relocation and Land Management	Reducing long-term exposure through spatial planning, including demarcation of risk areas and initiation of relocation; relocation of riverbank settlements to safer locations; and facilitation of housing reconstruction on alternative registered land
Reconstruction and Long-Term Resilience Building	Transition from recovery to sustainable development, including permanent reconstruction for disaster-affected beneficiaries; and preparation of sample design models for housing reconstruction approval

[41]*Meeting minutes of Melamchi Municipality for major flood relief and rehabilitation decisions.*

Key institutions involved in the Melamchi disaster response

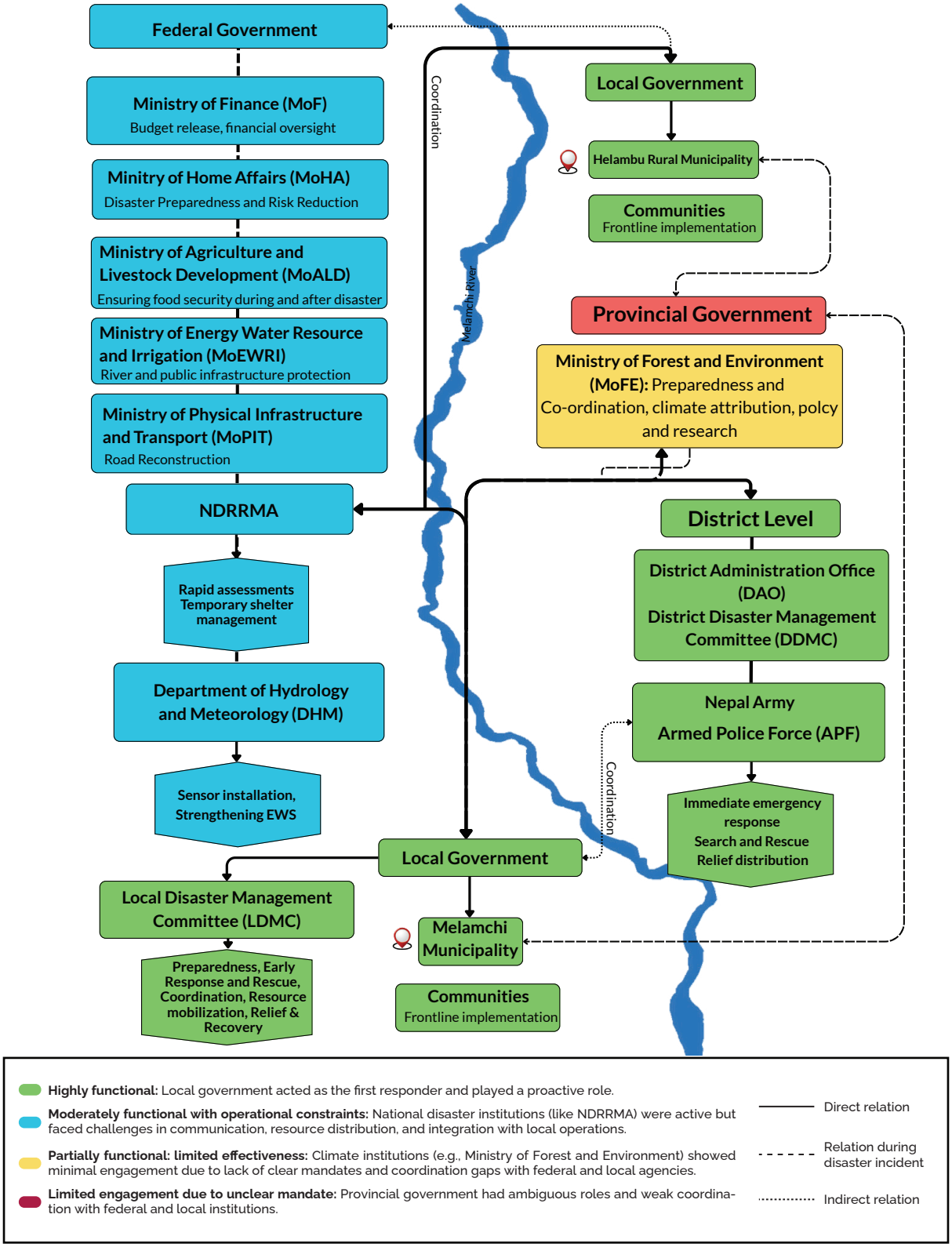

Figure 8: Key institutions underpinning the Melamchi case and the coordination mechanism

In addition, Figure 8 illustrates the institutions involved in the Melamchi disaster response, with solid lines representing a direct relation, while dotted lines indicating an indirect one. Although policies mandate coordinated action, the response in practice was often fragmented. Agencies such as the Ministry of Home Affairs (MoHA), the NDRRMA, the Nepal Army, the Armed Police Force (APF), and district-level committees are expected to work in close coordination, with local governments and communities acting as first responders. However, the response revealed significant gaps. While the NDRRMA coordinated efforts at the national level, support on the group remained disjointed, and many affected families have yet to receive full reconstruction payments. The Department of Hydrology and Meteorology issued updates only after the incident and installed sensors retrospectively.

The Nepal Army, the APF, and Nepal Police were rapidly mobilised for search and rescue operations and debris clearance under the command of district authorities. Meanwhile, the Melamchi Water Supply Development Board (MWSDB) focused on assessing and repairing damage to the Melamchi Drinking Water Project infrastructure, prioritising the restoration of water supply to Kathmandu. At the district and local levels, the DDMCs and municipal governments were responsible for relief distribution and damage assessments. However, unclear role delineation and weak communication with federal agencies led to frequent duplication of efforts and delays. Despite the presence of multiple institutions on the ground, the absence of a coherent and shared response strategy significantly reduced efficiency.

Another critical dimension of effective coordination involves the incentives of political leaders. Field consultations revealed that political parties frequently sought to influence post-disaster interventions in their favour, leveraging networks across federal, provincial, and local agencies to attract assistance and channel it towards preferred groups. According to local community members interviewed, although a formal process existed for updating data on casualties and physical damage, agencies lacked a unified and transparent approach. Nearly all major political parties were reported to have manoeuvred public institutions and resources to serve their own interests, particularly to gain favour with local populations in the aftermath of the disaster.

5 . Financial Mechanisms related to Loss and Damage with reference to the Melamchi river flood

Financing L&D is essential to support community recovery and to build back better, thereby strengthening the resilience of people and livelihoods. The scale and nature of L&D experienced in Melamchi highlight the need to examine financial allocation and mobilisation across all levels of government to adequately support vulnerable communities. This section examines existing financial provisions at the local, provincial, and federal levels and draws lessons for the future design of L&D financing mechanisms that are more localised, responsive, and inclusive.

5.1. Existing Financial Provisions

In Nepal, the channelling of disaster relief funds is governed by a multi-tiered institutional mechanism established under the Disaster Risk Reduction and Management (DRRM) Act, 2017. This federal framework is designed to ensure that resources flow from the central level to the provincial and local governments, ultimately reaching communities most affected by disasters.

At the municipal level, the Act on Environment and Natural Resource Conservation of Melamchi Municipality (2019)[42] includes provisions for the establishment and operation of an Environment and Natural Resource Conservation Fund. This fund addresses disaster impacts by providing both financial compensation and non-economic support such as relief and recovery services ensuring that resources are directed to urgent needs and that the full range of disaster effects is covered. The provisions relating to economic and non-economic loss and damage under this Act are summarised in Table 7.

Table 7: Key institutions underpinning the Melamchi case and the coordination mechanism

Provisions of Economic Loss and Damage	Provisions of Non-Economic Loss and Damage
Compensation for loss of property and livestock; cash support for housing, animal sheds, and livestock	Search and rescue, emergency response, volunteer mobilisation, technical development, and disaster management activities
Cash assistance for loss or damage to houses and animal sheds, relocation, and risk coverage	Provision of relief materials, temporary shelter, and waste and pollution management
Compensation for livestock deaths	Medical treatment for injured or sick individuals
	Psychological treatment and counselling for affected persons
	Assistance for final rites and related expenses for deceased victims

[42] *Melamchi Municipality. (2019). Environmental and Natural Resource Conservation Act. Melamchi*

At the local level, the Melamchi Disaster Management Fund (Operation) Procedure, 2021[43] established a dedicated financing mechanism for emergency response and compensation. This procedure was intended to ensure timely, structured, and accountable support for disaster-affected households. Under this mechanism, housing damage was compensated at NPR 15,000 for fully destroyed homes and NPR 10,000 for partially damaged ones. Loss, such as the death of a milking cow, was also compensated with NPR 10,000. The fund also allowed emergency disbursements of up to NPR 50,000 immediately, and up to NPR 500,000 during the response phase, enabling timely assistance to impacted families.

Despite these efforts, existing financial provisions for L&D at the provincial and federal levels in Nepal remain narrow in scope. While the National Climate Change Policy (2019) envisions allocating 80% of international financing to adaptation measures at the local level, and the Local Adaptation Plans of Action (LAPA) Framework (2019) aims to channel resources locally, these mechanisms primarily focus on adaptation rather than L&D. The National Framework on Loss and Damage (2021) acknowledges the need for systematic approaches to assess climate-induced L&D, estimate associated costs, and design and implement policies to minimise these impacts. Similarly, the National Disaster Risk Financing Strategy (2021)[44] recognises the importance of accounting for extreme climate events and climate-induced disasters in financing criteria and allocation mechanisms.

The DRRM Act (2017) and its Rules (2019) established disaster management funds at the district, municipality, and community levels, laying the groundwork for institutional response. The Act provides for compensation and livelihood support, including basic compensation for requisitioned land and crops, limited relief for households affected by death or property loss, and self-employment or income-generating programmes. However, its emphasis remains on immediate relief and housing, with land, crops, and livestock, which are central to rural livelihoods, largely excluded or inadequately addressed. For example, in Melamchi, substantial agricultural land was lost but compensation was not provided because it was not included in the Act.

The Standards for Disaster Victim Rescue and Relief (2020) further reinforce this narrow focus by detailing immediate relief provisions such as NPR 15,000–20,000 per household and NPR 200,000 as death compensation per fatality. These standards, however, do not address damages to agricultural land, crops, livestock, cultural structures, or psychosocial well-being. While disaster-affected households may receive varied recovery and long-term assistance under different budgetary provisions such as death compensation (NPR 200,000 for each fatality), funeral costs (NPR 50,000 if an entire family has died), temporary shelters, livelihood restoration support, and injury-related aid long-term housing reconstruction grants under the Disaster-Affected Private Housing Strengthening, Reconstruction, and Resettlement Grant Procedure 2081 (First Amendment) range from NPR 300,000 to 500,000, depending on region, again prioritising housing over livelihood and non-economic L&D.

Overall, the analysis shows that despite the existence of policy provisions for financial allocation regarding L&D, local-level legislation, such as the Disaster Risk Management and Climate-Resilient Municipal Development Act, 2018, reveal that compensation remains narrowly focused on immediate relief and housing. Losses related to land, crops, livestock, and other forms of non-economic loss and damage remain largely unaddressed.

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[43]Melamchi Municipality. (2021). Disaster Management Fund Operation Procedure. Melamchi.
[44]Government of Nepal. (2021). National Disaster Risk Financing Strategy. Ministry of Home Affairs. National Disaster Risk Reduction and Management Authority (NDRRMA).

5.2. Operationalisation of Loss and Damage relevant Financial mechanisms

Estimated economic loss from the Melamchi river flood was approximately USD 436 million in Melamchi municipality and USD 204.56 million in Helambu rural municipality, compared with annual budgets of only USD 10.5 million and USD 3.8 million respectively. A consultation in Helambu revealed that only 8–9% of the 2021/22 annual budget was allocated to disaster response. Helambu rural municipality reported providing USD 3,800 per destroyed household, with an additional USD 1,216 to female-headed households (Parajuli et al., 2023). These figures highlight a substantial gap between the scale of disaster-related loss and the availability of domestic financial resources. Moreover, the Government of Nepal did not receive direct international climate financial support for Melamchi reconstruction, and there is little evidence of serious, systematic efforts to seek or access such funding an area further constrained by complex procedural requirements.

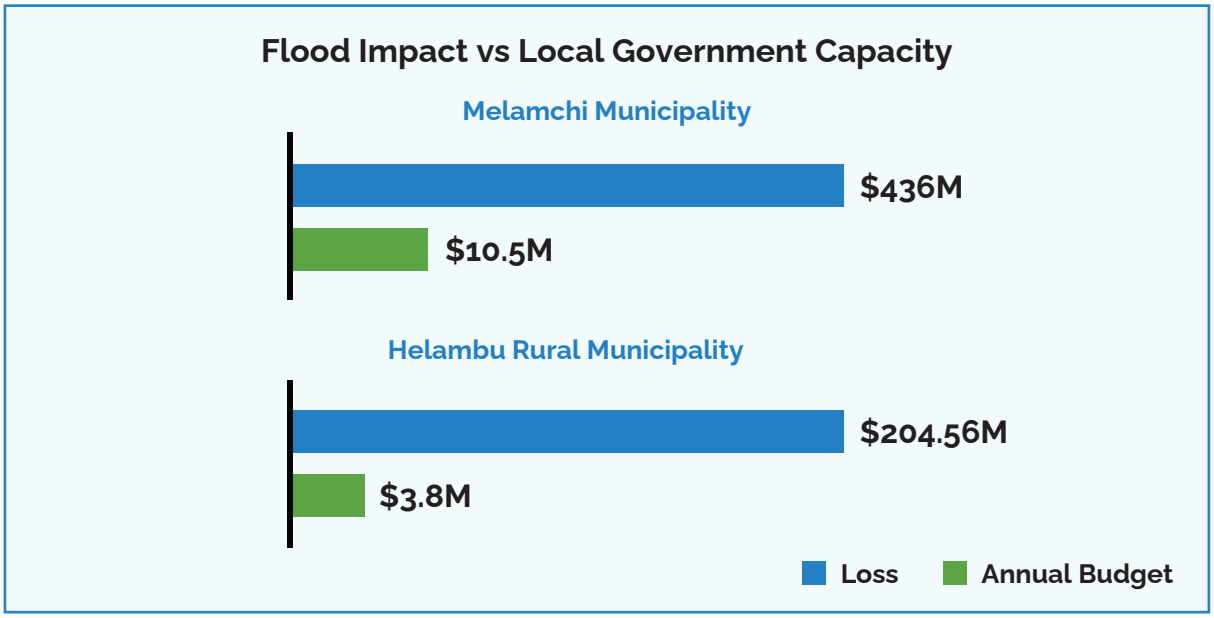

Figure 9: Flood Impact vs Local Capacity

This study finds that, following the Melamchi river flood, the federal government supported private housing reconstruction through a cost-sharing model, allocating USD 0.38 million to Melamchi municipality and USD 0.22 million to Helambu rural municipality. Through existing budgetary mechanisms, disaster-affected households received varying levels of immediate and long-term assistance. Immediate support included temporary shelter, livelihood restoration assistance, death compensation, and funeral costs in cases where an entire family has died, and support for injuries. Longer-term assistance, primarily in the form of housing reconstruction grants, was determined by regional criteria.

According to the local government authorities, in the aftermath of the Melamchi river flood, multiple government agencies and Melamchi municipality allocated significant resources for road rehabilitation, riverbank protection, and relief support for affected households. However, despite substantial pledges from philanthropists and institutions, only about one-quarter of the committed funds were ultimately disbursed, revealing a persistent gap between financial commitments and actual delivery. A detailed breakdown of these allocations is presented in Table 8.

Table 8: Financial Allocation to the Melamchi Disaster from varied sources (Source: Desk review)

Source of Fund	Total Allocation	Focus of the Fund
Department of Irrigation	USD 2.33 million	Allocated over three fiscal years for riverbank protection, schools, temples, and settlement safeguarding
Department of Roads; Department of Water Resources and Irrigation	USD 2.14 million	Allocated for road repairs, including the Melamchi Bazaar-Headworks route, mostly completed
Melamchi municipality	USD 1.06 million	Directed towards direct relief for flood-affected households
Philanthropic contributions	USD 8,739,165 pledged; USD 2,241,905 disbursed (approx. 25.65%)	Pledged by individual donors and institutions

As explained earlier, the Melamchi municipality relied heavily on its domestic resources to support disaster-affected households, diverting a substantial share of its development budget towards relief, reconstruction and rehabilitation works. The following measures were undertaken by the local government:

- Safe food and accommodation were provided for 500 people from 70 households.
- Multiple institutional mechanisms were mobilised, including disaster management, interim management and rehabilitation committees, inter-agency coordination and advisory committees, disaster risk reduction sub-committees, and expert committees.
- Works were undertaken to reduce river-related risks.
- Approximately 700 gabions were procured and distributed for river and market protection.
- Cash assistance was provided as follows: NPR 25,000 for households with completely damaged houses or accommodation; NPR 20,000 for partial damage to house or accommodation; NPR 15,000 for complete damage to business infrastructure; and NPR 10,000 for partial damage to business infrastructure. Atotal of 286 people received NPR 5,875,000 in cash assistance.
- To support relief and rehabilitation, the Melamchi municipality established the Melamchi Flood Victim Relief and Rehabilitation Fund, allocating NPR 47,015,535.
- An additional NPR 10,000 was distributed each to 93 flood-affected landowners.

Despite these efforts, financial mobilisation faced numerous challenges. The funds, managed by the Financial Comptroller General Office (FCGO), were subject to bureaucratic delays due to extensive documentation requirements, resulting in prolonged disbursement timelines. As a result, many affected households are still awaiting their final instalment payments.

Moreover, the blanket approach of providing compensation to households regardless of the scale and impact of the disaster was inadequate and unscientific. As the Mayor of Helambu said, "The Melamchi river flood is incomparable to other disasters, so using the same grant standard is biased and impractical."

Survey findings reinforce this concern: 62% of respondents viewed the financial support as unsatisfactory (14% strongly disagreed), while only 22% found it satisfactory (3% strongly agreed). Dissatisfaction was particularly high because compensation largely targeted only households that lost their homes, excluding losses related to land, livelihoods, and other forms of damage (Parajuli et al., 2023)[45].

Municipal authorities report that approximately 272 households received the first instalment for reconstruction and rehabilitation. However, only 136 households pursued the second instalment (a 50% drop) and just 61 received the third, representing a 78% decline from the previous stage. Several factors contribute to households' reluctance to access the second and third instalments: (a) grant guidelines require demolition of affected houses according to NDRRMA criteria; (b) the amount provided is insufficient for most households, given their economic conditions; and (c) many households are unwilling to change the location of their new houses. The vice mayor of Melamchi municipality raised concerns about government policies that restrict house construction in other areas and neighbouring municipalities, arguing that these rules demotivate households who believe they deserve a safe place to live of their choosing. Additionally, the required 10% local government contribution, mandated by national policies, is burdensome for rural municipalities with very limited budgets.

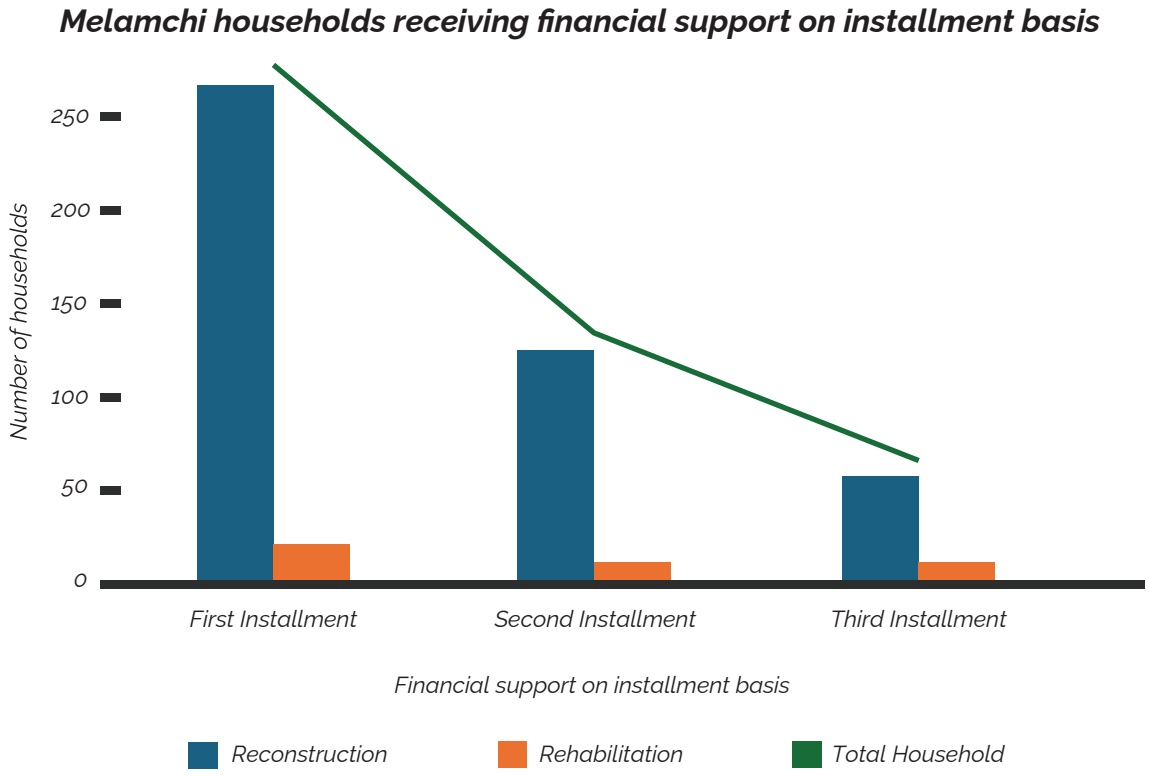

Figure 10: Trend of households receiving financial support

Source: Melamchi municipality

[45]*Parajuli, B.P., Baskota, P., Singh, P.M., Sharma, P., Shrestha, Y., & Chettri, R.P. (2023). Locally Led Assessment of Loss and Damage Finance in Nepal: A Case of Melamchi Flood 2021. Kathmandu: Prakriti Resources Centre.*

Another challenge is the procedural complexity of accessing disaster funds. Consultations revealed that the Financing Disaster Fund automatically enrols families with poverty IDs or social security records as beneficiaries, but others must apply through wards or local camps. Duplicate claims are removed through verification, and prioritisation depends on disaster impact and resource availability. Funds are transferred directly to beneficiaries' bank accounts, with separate lists for immediate relief and recovery or livelihood support. Local officials also noted that eligibility criteria require house reconstruction to occur in the same locality, further limiting flexibility for affected families.

A review of NDRRMA's fund disbursement process in Melamchi shows considerable institutional complexity and bureaucratic hurdles that delay compensation. For losses involving land, crops, livestock, and infrastructure, security agencies conduct data assessments, which are then either uploaded by the agencies or submitted to the municipal office for entry into the relevant portal. Compensation for these losses is managed by sectoral ministries, rather than disaster management committees. Notably, no formal compensation system exists for agricultural land loss under the disaster management law, meaning Melamchi residents were not compensated for such losses. Compensation for crops and livestock depends on insurance schemes or sporadic ministry programmes. (See Box C for details.)

Box C: Case Study: Process of Fund Disbursement by NDRRMA

Following the 2021 monsoon floods in Bagmati Province, the Nepal Disaster Risk Reduction and Management Authority (NDRRMA) initiated its damage assessment and compensation process.

Damage Assessment

Municipal engineers were deployed to affected wards to assess residential damage. This allowed for a prompt and systematic evaluation, as had been practised during recent earthquake responses.

Data Compilation and Uploading

Each municipality compiled assessment data and uploaded it into the municipal IT system to facilitate reconstruction tracking.

Approval Flow

The data was forwarded from the municipal office to the provincial authority and subsequently to the federal government for verification and final approval.

Fund Allocation and Disbursement

Once approved, compensation funds were drawn from the District Disaster Management Fund (DDMF), which pools resources from federal allocations, NDRRMA assistance, provincial contributions, and donor grants (with Ministry of Finance approval).

The DDMF then disbursed funds to local disaster management funds, which then directly transferred cash relief to affected households' bank accounts.

Human Loss Compensation

Security agencies and local authorities collected data on fatalities. The municipality, using allocations from the DDMF, provided direct cash relief (e.g., NPR 500,000 per fatality) to the next of kin.

In summary, local consultations indicate that losses of agricultural land, business assets, and other livelihood activities are among the most significant yet unrecognised impacts of the Melamchi flood. While existing policies and compensation mechanisms focus primarily on housing reconstruction and immediate relief, the destruction of land the very foundation of rural livelihoods and security has been entirely overlooked. This omission underscores a broader limitation of Nepal's disaster response frameworks, which are centred on housing rather than on long-term livelihood assets like agricultural land, critical for rural resilience, especially in communities where land losses often exceed housing damage.

5.3. External factors impacting the Financial allocation committed for the Melamchi river flood

This study also identified several factors that influenced the financial allocation for Melamchi flood victims. Some of the most important factors are outlined below.

1 Shifting Government Priorities

The Nepal government's response to consecutive disasters demonstrates how financial resources are often redirected from one recovery effort to another. In Melamchi, for instance funds originally meant for the 2021 disaster's recovery were diverted to respond to the Jajarkot earthquake that occurred in November 2023. This highlights a reactive and fragmented system for L&D financing in Nepal, lacking a stable reserve to ensure timely compensation and reconstruction following multiple disasters.

This financial fragility translates into social frustration. Respondents from Melamchi expressed concerns that, following the 2024 flood, which primarily affected Kathmandu, their own rehabilitation might be neglected as attention and resources focus on the capital. Federal-level officials noted that the frequent occurrence of overlapping disasters strains the already limited public budget, emphasising the need for a sustainable financial reserve for loss and damage in Nepal.

2 Technical Challenges in Post-Disaster Recovery in Melamchi

A significant bottleneck in post-disaster recovery in Melamchi was the tension between building code compliance and compensation disbursement. Many affected households reconstructed their homes without consulting engineers or obtaining formal approvals, largely due to financial constraints.For example, acquiring official building plans (naksaa) can cost between NPR 10,000 and 15,000 an unaffordable expense for many families who are already economically vulnerable. In addition, compensation was disbursed in instalments: the first after laying the foundation, the second following after partial construction, and the third upon completion in accordance with building codes and standards. However, retrofit costs for partially damaged houses often exceeded the compensation provided, imposing an additional financial burden.

This obstacle highlights a structural gap in disaster recovery mechanisms: while the policy intends to ensure safe and resilient housing, it often clashes with the reality of limited household resources, high reconstruction costs, and low technical capacity. According to government officials, the instalment system, while designed to enforce compliance, inadvertently delays full recovery.

3 Data and NDRRMA Reconstruction MIS Efficiency

The Management Information System (MIS) continues to struggle with inconsistent updates, duplicate entries, and slow processing. In Melamchi, a single data entry error delayed compensation for entire groups of affected households, exposing the system's fragility and resulting in funding delays. Local officials from Melamchi stated, "The MIS system is still being updated, so it seems slow. Even when we upload a beneficiary's name, it does not always appear in the system. To work efficiently, the MIS software must be upgraded."

Consultations at the local level also raised concerns about the disaster portal (Bipad Portal), noting a lack of capacity in both knowledge and human resources to meet its requirements, particularly regarding the use of data for planning and decision-making.

4 Underestimation of Cultural Loss

Consultations with local communities revealed that the destruction of temples, monasteries, cremation sites, and other cultural spaces central to community identity was not addressed or compensated for within current DRR frameworks. This gap reveals a structural bias in disaster governance, which prioritises physical assets over non-economic dimensions.

Field observations showed that municipalities undertook small-scale efforts at cultural revival, such as modest funding for youth groups practising dhime baja or supporting khaijidi bhajan. However, these initiatives were outside formal DRR frameworks. The symbolic nature of such support underscores the absence of institutional mechanisms or dedicated budgets for cultural rehabilitation. Without integrating cultural and intangible losses into national recovery frameworks, post-disaster interventions may undermine community cohesion and long-term resilience.

5 Absence of Climate and Disaster Risk Financing Insurance

The scale of the Melamchi flood highlighted the need for innovative financing mechanisms, such as climate and disaster risk financing insurance. Yet risk transfer mechanisms were largely absent at the the local level, weakening community adaptive capacity and creating significant hurdles for timely relief and recovery. Local officials reported that social security mechanisms are underdeveloped locally, leaving households with limited adaptive capacity and hindering their recovery following disasters.

[46]FRLD is established to provide financial assistance to vulnerable developing countries to address the irreversible economic and non-economic impacts of climate change, such as extreme weather and slow-onset events, supporting recovery, reconstruction, and resilience through country-led, locally driven solutions.

[47]Please note that these are still under discussion according to MoFE officials as of February 5, 2026).

6. Government Response to Fund for Responding to Loss and Damage

The government plans to designate the Ministry of Forests and Environment (MoFE) as the national authority for L&D and as the focal liaison with the Fund for Responding to Loss and Damage (FRLD)[46]. To ensure effective implementation and coordination at national and sub-national levels, a dedicated Loss and Damage Coordinating Body, composed of key ministries and agencies, is set to be established. Under the Climate Change Management Division (CCMD), a national platform will convene government representatives, accredited entities, donors, civil society, and the private sector for planning, dialogue, and partnership-building[47].

To mobilise financial resources, the government proposes a tiered approach. Government officials interviewed for this study explained that the priority is to first secure direct access to the L&D Fund through the Ministry of Finance, using treasury channels to enable rapid and sustained responses. These funds will be distributed via existing disaster-related mechanisms at both national and local levels. The second priority involves channelling resources through nationally accredited entities affiliated with the Green Climate Fund (GCF) and the Adaptation Fund (AF), such as the National Trust for Nature Conservation (NTNC), the Alternative Energy Promotion Centre (AEPC), and the Nepal Investment Mega Bank (NIMB), to reach vulnerable communities while ensuring robust coordination. The third priority allows for the optional use of regional or international accredited entities as needed, maintaining coordination and accountability.

Government officials indicated that immediate priorities for FRLD funding will focus on supporting areas affected by glacial lake outburst floods (GLOFs), recent floods, and landslides; promoting landslide-safe zoning; upgrading resilient infrastructure; and addressing drought or water scarcity through watershed restoration and sustainable agriculture initiatives. Longer-term priorities include developing community-based multi-hazard early warning systems, shock-responsive social protection for anticipatory action, inclusive insurance schemes for the most vulnerable, and strengthening capacity at national and local levels.

Procedurally, the government proposes that the CCMD will serve as the L&D Fund Secretariat, responsible for developing proposals, monitoring, and evaluation, and reporting in alignment with both national requirements and UNFCCC standards. Guidelines and templates for proposal submissions will be established, with emphasis on transparent, multi-stakeholder governance and coordination. In conclusion, Nepal is taking proactive steps to operationalise L&D finance by leveraging existing institutions and financial mechanisms, designating clear focal authorities, engaging a broad range of stakeholders, and aligning efforts with both national priorities and international standards. This phased and pragmatic approach aims to ensure that support remains accessible, accountable, and responsive to Nepal's ongoing climate risks.

Despite the initiatives, uncertainties remain regarding how the fund will be channelled and how resources will be distributed equitably to directly benefit households and communities. Government officials also acknowledged that adopting a "learning by doing" approach will be essential to refine operational mechanisms and ensure effectiveness.

Conclusion

The assessment of economic and non-economic L&D from the Melamchi river flood reveals the scale and severity of climate change impacts, which are cascading in nature and often compounded by geographical, technological, and financial constraints, as well as broader socio-economic and structural challenges. The findings underscore the critical importance of accounting for non-economic loss and damage, particularly impacts on culture, tradition, livelihoods, social cohesion, and gendered and intersectional vulnerabilities. The Melamchi case further demonstrates the clear interlinkages between economic and non-economic loss and damage, underscoring the need to address not only disaster-specific impacts but also underlying, broader climate change risks and systemic vulnerabilities. A review of policies, institutional arrangements, financial mechanisms, and local responses reveals the limitations of existing adaptation and disaster risk reduction and management efforts, which remain constrained by both internal and external challenges.

In Nepal, although an evolving policy and legal architecture exists to address climate change and disaster risk reduction, significant gaps persist in the operationalisation and effectiveness of L&D responses. The integration of L&D within the National Climate Change Policy, the Disaster Risk Reduction and Management Act, and related strategies reflects a national recognition of multiple climate-induced as well as natural hazards. However, these frameworks remain largely focused on immediate economic relief, especially for housing and fatalities, while broader economic losses (such as land, business infrastructure, and livelihoods) and non-economic harms (such as psychosocial trauma, loss of cultural identity, and community cohesion) are inadequately addressed or, in many cases, overlooked altogether.

Institutional coordination mechanisms for L&D, while clearly articulated on paper, exhibit functional weaknesses in practice. Although disaster management committees are operational, national-level councils and committees have often demonstrated delayed responses and limited engagement with local crises such as the Melamchi flood. As a result, local disaster management committees are frequently left to respond only after significant damage has already occurred. Inter-agency fragmentation, compounded by political influences, has contributed to duplication, inefficiencies, and inequitable distribution of support. Persistent coordination challenges across federal, provincial, and local levels along with unclear operational roles and mandates continue to undermine comprehensive disaster response and recovery.

Financial mechanisms, while nominally inclusive, are constrained by limited resources, bureaucratic hurdles, and a predominantly reactive approach to recurring disasters. Compensation frameworks prioritise rapid relief for visible and immediate losses, while disbursement processes are often delayed by documentation requirements and tiered payment systems. The lack of compensation for essential livelihood assets such as land and business infrastructure reveals a structural gap that disproportionately affects rural populations, particularly women and economically marginalised groups.

The Melamchi experience illustrates the inadequacy of existing frameworks in addressing both immediate and long-term losses. Shifting government priorities, overlapping disasters, and technical and procedural roadblocks have collectively delayed and diluted recovery efforts. Moreover, the exclusion of non-economic L&D from disaster response policies undermines community resilience and psychosocial recovery, with cultural loss and intangible harms receiving minimal institutional attention.

In the context of the country's preparation for accessing the Fund for Responding to Loss and Damage (FRLD), the government proposes to leverage existing DRRM institutional structures and financial mechanisms to effectively access and distribute L&D finance. While proactive measures towards coordination and institutional readiness are evident, ensuring equitable, transparent, and accountable delivery of support to communities most vulnerable to disasters remains a significant challenge. Continuous learning, adaptation, and course correction will be essential to meet both national priorities and international climate commitments.

To strengthen resilience and recovery in communities such as Melamchi, Nepal must move beyond a relief-oriented disaster response model. This requires long-term, inclusive frameworks that explicitly recognise both economic and non-economic L&D, ensure timely and equitable financial support, and clarify institutional mandates for L&D responses. Integrating cultural and psychosocial rehabilitation, strengthening social cohesion within formal disaster recovery systems, enhancing inter-agency collaboration, and establishing sustainable financial reserves are essential steps towards building a more comprehensive, just, and people-centred disaster governance regime one that truly leaves no one behind.

Recommendations

This study has examined the Melamchi river flood, its consequences and impacts, and the responsiveness of existing policy, institutional, and financing arrangements. The study's key lessons underscore the need for practical and pragmatic approaches to strengthen Nepal's response to climate extremes and to address L&D in a more systematic and inclusive manner. The following recommendations aim to support the Government of Nepal, national stakeholders, and the global community in rethinking current approaches and strengthening response mechanisms to make them more robust, coordinated, and responsive.

1. Revise and Reform Existing Policies and Plans on the Mobilisation of Disaster Risk Reduction Management

There is an urgent need to develop more context-specific standards and guidelines for the provision of relief and rehabilitation support to affected households, based on the scale, nature, and impact of disasters. Compensation mechanisms should reflect actual loss and damage rather than relying on uniform, blanket approaches.

Policy reforms should also extend compensation and support to major livelihood assets, including land, businesses, and other assets, for disaster-affected households. In addition, policies must explicitly recognise non-economic loss and damage, both in data collection and in the design of relief and rehabilitation, to address issues such as cultural loss, psychological distress, and social fragmentation.

2. Develop Clear Strategy and Action Plans to Operationalise the National Loss and Damage Framework, Balancing Economic and Non-Economic Loss and Damage

To translate Nepal's National Framework on Loss and Damage into practice, policies must be closely aligned with local realities. Following disaster events like the Melamchi flood, local governments should conduct comprehensive risk and impact mapping that captures both economic losses such as damage to housing, agriculture, and infrastructure and non-economic damages, including trauma, disrupted social life, and the loss of cultural and religious sites. Establishing a National Loss and Damage Coordination Unit within the Ministry of Home Affairs, backed by provincial and local committees, would enable timely and coordinated responses. At the community level, inclusive committees comprising local leaders, youth, women, and marginalised groups should be engaged to design, implement, and monitor interventions.

Disaster recovery efforts must move beyond asset-based compensation towards a holistic framework that addresses economic and non-economic losses together. Experiences from Melamchi and Helambu demonstrate that reconstruction-focused responses overlook psychosocial distress, cultural erosion, and weakened social cohesion. Although these dimensions are acknowledged in the DRRM Act and the National Loss and Damage Framework, weak operationalguidance and inadequate financing limit their implementation. Integrating all forms of loss into a unified recovery framework would support the restoration of livelihoods, mental well-being, cultural continuity, and long-term community resilience.

3. Improve Institutional Coordination and Synergy Across All Tiers of Government and Stakeholders

While institutional mechanisms exist to address climate change and disaster risk reduction, weak collaboration and limited synergy continue to undermine effective responses. DRR institutions largely operate within traditional rescue-and-relief frameworks, which fail to address the full scale of economic and non-economic impacts and losses. To strengthen collaboration, the roles, mandates, and working modalities of relevant institutions must be revised through amendments to the DRRM and Environment Protection Act and the Climate Change Management Council regulations, as well as adjustments to the government's business allocation rules. Key measures include establishing joint working groups, developing integrated action plans, holding regular inter-agency coordination meetings, and creating unified monitoring and reporting mechanisms to support a more holistic and coordinated response to climate and disaster risks.

Building on these reforms, the study proposes a flexible framework for mobilising and managing climate finance for timely and targeted responses to future loss and damage events (Figure 11). International support such as finance from the Fund for Responding to Loss and Damage (FRLD) would be complemented by global coordination and technical support mechanisms, including the Warsaw International Mechanism (WIM) and the Santiago Network, which provide policy direction and technical capacity to countries such as Nepal. These international inputs would be channelled through the national system via a central coordinating body, the National Entity on Loss and Damage, which oversees fund allocation, cross-sectoral coordination, and alignment with national priorities. This entity could be hosted within an existing institution or established as a new body, depending on national consensus.

The national mechanism would be structured around six sectoral pillars, each led by relevant agencies but closely coordinated by the national entity: (1) Policy and Target Setting, led by the MoFE, MoHA and federal/provincial and local governments; (2) Risk Assessment and Attribution, led by DHM, DoWIDM, and NDRRMA; (3) Adaptation, coordinated by MoFE, MoF, and NPC; (4) Loss and Damage Assessment, focusing on quantifying and reporting disaster impacts; (5) Finance Mobilisation, facilitated by MoHA, MoF, and NPC; and (6) Post-Disaster Relief, Reconstruction, and Relocation, led by MoHA and local governments. Local governments would play a central role in fund disbursement at the implementation level, as the closest tier of government to affected people, ensuring that communities and vulnerable groups are the final recipients of support. Where appropriate, the model also enables direct access to resources through local governments or accredited community-based organisations to encourage innovation and provide direct, needs-based grants.

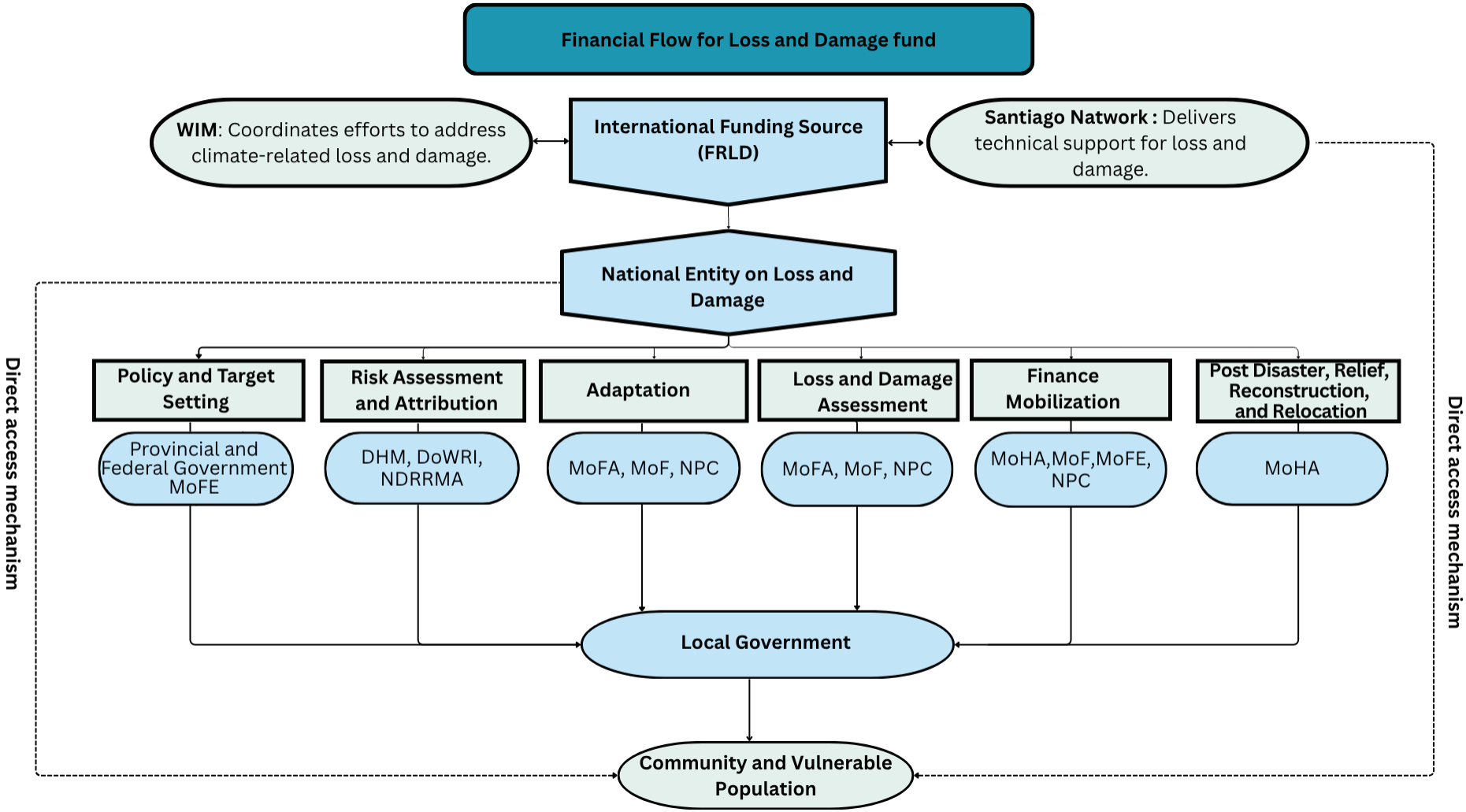

Figure 11: Proposed financial framework for mobilising the L&D Fund

4. Develop an Investment Plan to Mobilise the Fund for Responding to Loss and Damage and Other Climate Finance

The scale of the Melamchi river flood has exposed the inadequacy of existing funding mechanisms to address L&D comprehensively. A dedicated and transparent financing window is required to support not only physical reconstruction but also psychosocial services and cultural heritage restoration. Experiences from Melamchi as well as the GLOF events in Thame and Rasuwa demonstrate that affected communities require integrated support addressing both infrastructure repair and emotional recovery and heritage protection. This fund could be supported by international sources, such as the FRLD, bilateral and multilateral donors, as well as philanthropic and private-sector contributions. To ensure transparency and accountability, third-party monitoring by local NGOs and academic institutions should be institutionalised, with mechanisms for community feedback and adaptive learning.

At present, the absence of a dedicated L&D fund within Nepal's DRR governance framework creates a critical financing gap. Rather than establishing parallel structures, Nepal can expand and institutionalise current instruments, such as the Prime Minister's Relief Fund, DRRM fund and other existing funds, to serve as an L&D financing window. This approach would promote coherence within the DRR framework while ensuring that international L&D finance directly benefits affected communities rather than being confined to institutional strengthening.

5. Strengthen Data and Tracking Systems for Transparent and Accountable recovery

Fragmented data systems and manual verification processes currently result in duplication, delays, and inconsistencies in fund disbursement across government tiers. Investment in digital data management, beneficiary tracking, and fund flow monitoring systems would support more coordinated and evidence-based responses. In addition, establishing legally binding timelines for fund approval and disbursement from municipality to federal levels would help reduce bureaucratic delays and ensure timely and equitable recovery support.

6. Advancing Climate Adaptation through Inclusive Risk Transfer and Capacity Building Initiatives

Local governments, with support from federal and provincial governments, should implement disaster risk insurance schemes and develop integrated climate and disaster risk financing strategies in partnership with private insurers and national and international stakeholders. Capacity-building through regular training programmes and public awareness initiatives is essential, alongside updates to local disaster management plans to incorporate clear provisions for risk transfer and financing mechanisms. Policy reforms should incentivise private-sector participation and provide subsidies for communities vulnerable to disasters to ensure widespread, equitable access. Robust monitoring and evaluation systems are also needed to assess and continuously improve these mechanisms, strengthening local adaptive and resilience capacities.

7. Operationalise Non-economic Loss and Damage Recovery through Budgeted and Community-centred Interventions

Non-economic loss and damage (NELD) continues to receive limited attention within disaster recovery frameworks, despite its critical role in shaping long-term recovery and resilience. Evidence from disaster-affected communities in Melamchi and Helambu shows that psychosocial distress, cultural loss, and social disruption are not short-term impacts, but persist even after physical reconstruction has been completed. Yet recovery efforts remain heavily focused on economic loss, with NELD treated as secondary and rarely supported by dedicated budgets, clear mandates or implementation mechanisms.

Integrating NELD as a core pillar of disaster recovery is therefore essential for achieving meaningful and sustainable recovery. Policymakers should, for instance, establish dedicated funding for psychosocial services, integrate mental health support into local recovery plans, and partner with local cultural institutions such as youth groups and guthis. Targeted support for women, children, older persons, and youth would further enhance equity and strengthen long-term community resilience.

8. Promote Co-Learning and Knowledge Sharing for More Effective and Practical Solutions

The Melamchi river flood underscores the importance of co-creation and knowledge sharing among local, provincial, and federal agencies, as well as research institutions and development organisations. A multi-actor partnership approach can strengthen shared understanding of L&D, facilitate knowledge exchange, and support the development of more practical, context-sensitive, and long-term solutions to climate-induced disasters.

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