

# BOOKLET

# A Concise Information on LOSS AND DAMAGE: NEPAL

Chanaute Bazar

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# **LOSS AND DAMAGE**





Flood in Helambhu and Melamchi





Landslide in Rasuwa district



Flood in Rajapur Municipality



Flood in Thame Village, Solukhumbu (Photo credit: P.Sherpa)













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#### LOSS AND DAMAGE BOOKLET: NEPAL

**Published by** Prakriti Resources Centre, April 2025

#### © Prakriti Resources Centre (PRC), 2025

Citation: Prakriti Resources Centre (PRC). (2025). Loss and Damage Booklet: Nepal.

Authors: Mingma Yangji Sherpa, Sneha Rai and Pratima Sharma

#### Acknowledgement

We would like to put on record our gratitude to International Centre for Climate Change and Development (ICCCAD) for supporting the Strengthening Loss and Damage Response Capacity in the Global South (STRENGTH) project, under which this booklet has been prepared and published. Our sincere appreciation goes to Institute for Study and Development Worldwide (IFSD) for their valuable suggestion and feedbacks in shaping this booklet. We greatfully acknowledge the financial support provided by International Development Research Centre (IDRC) which has been instrumental in completion of this booklet.

We extend our special thanks to Prabin Man Singh for his review and thoughtful feedback in the booklet. We acknowledge Marissa Taylor for her editing support, which has helped refine the booklet. Abadesh Singh also deserves our thanks for translating the booklet into Nepali enabling it to reach a wider audience.

We hope this booklet serves as a valuable resource for broad range of stakeholders, including policymakers, leaders and champions of Loss and Damage, vulnerable communities, local government representatives and non-governmental actors engaged in advancing the L&D agenda in Nepal

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# **An Introduction to the Booklet**

Climate change is one of the most pressing challenges of our time with mountain regions serving as visible indicators of its impacts. Nepal with its mountainous geography, reliance on agriculture, and dependence on natural resources, is among the most vulnerable countries. The country faces increasing threats from climatic hazards such as flood, landslides, and hydro-meteorological extreme events inducing loss and damage. Nepal has experienced both slow onset events (drought, glacier melting) and rapid onset events (flood, landslide, wildfire), which are intensifying in frequency and magnitude leading to widespread economic and non-economic losses.

Loss and damage refers to the negative effects of climate change that occur despite mitigation and adaptation efforts. The increasing occurrence of climate induced loss and damage is evident in recent disasters such as the Melamchi flood (June, 2021), the Thame flood (August, 2024) and the September 2024 flood, which severely impacted the country including Kathmandu valley and other vulnerable regions.

Despite increasing relevance and the existence of global literatures, loss and damage remains a relatively emerging concept with many stakeholders still struggling to differentiate it from post disaster recovery, response, and adaptation efforts. This is because resources contextualized to Nepal's realities remain limited. Hence, this booklet seeks to bridge that knowledge gap by providing a Nepal focused perspective in a comprehensive yet easy-to-understand guide and also ensuring accessibility to a broader audience through its translation into Nepali.

Designed for a range of stakeholders, including policymakers, vulnerable communities, local government representatives, non-governmental actors, leaders and champions of Loss and Damage working to advance the L&D agenda in Nepal, this booklet explores the scientific perspective, relevant policies, financial costs, potential solutions and international frameworks in a simplified and structured manner.

By enhancing understanding and fostering informed discussions, this booklet aims to empower stakeholders to take proactive steps in addressing climate induced loss and damage in Nepal.

# **Organization of The Booklet**

This booklet is structured in six chapters to simplify complex topics with pictures, graphs and tables for better understanding. The booklet begins with the fundamental overview of climate change outlining its causes and consequences while other aspects are explored in different chapters accordingly.

**Chapter 1** introduces the concept of climate change and its impacts including extreme weather events and their impacts on different sectors.

**Chapter 2** focuses on the core subject of this booklet- Loss and Damage. It provides a foundational understanding of the concept from Nepal's context.

**Chapter 3** discusses relevant policies with an overview of Nepal's National framework on loss and damage, followed by an exploration of Disaster Risk Reduction and climate change policies. The chapter also highlights the gaps and limitations in existing policies on loss and damage.

**Chapter 4** examines the financial cost of loss and damage in Nepal representing historical data and figures and includes case studies to provide deeper insights.

**Chapter 5** suggests possible solutions to address loss and damage. It outlines different strategies and activities that can help minimize and manage the impacts of climate change.

**Chapter 6** looks back at the history of L&D discussions at the international level. It introduces the concept of adaptation limit concluding the booklet with an overview of the finding mechanisms available to respond to L&D.

# **Abbreviation**

СОР	Conference of the Parties
DHM	Department of Hydrology and Meteorology
DPNet	Disaster Preparedness Network-Nepal
DRR	Disaster Risk Reduction
GLOF	Glacial Lake Outbrust Flood
GoN	Government of Nepal
ICIMOD	International Centre for Integrated Mountain Development
IPCC	Intergovernmental Panel on Climate Change
L&D	Loss and Damage
MOFE	Ministry of Forest and Environment
MOFE	Ministry of Forest and Environment
МОНА	Ministry of Home Affairs
MOPE	Ministry of Population and Environment
NAP	National Adaptation Plan
NDRRMA	National Disaster Risk Reduction and Management Authority
NEFIN	Nepal Federation of Indigenous Nationalities
PRC	Prakriti Resource Centre
UNFCCC	United Nations Framework Convention on Climate Change
USD	United State Dollar
WFP	World Food Program

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### **CHAPTER-1**

#### Climate Change



Climate change refers to the long-term changes in climate patterns, which may result from natural processes or human actions, leading to an increase in the Earth's temperature (UN, n.d). In the last century, however, human activity has significantly contributed to climate change and global warming due to increase in greenhouse gases in the atmosphere.



#### **Indicators of Climate Change**

The main indicators of climate change include rising average global temperature and variations in precipitation (UNFCCC, 2007).



- Global surface temperature is the average temperature across sea surface and air temperature over land (PlanA Earth).
- According to the Intergovernmental Panel on Climate Change (IPCC), the Earth's average temperature has risen by 1.09°C since pre-industrial times, with human influence being the primary cause.
- Nepal's average minimum temperature trend shows an increasing trend annually.
- Precipitation refers to any form of • water - rainfall, snowfall, or other form of frozen or liquid water falling from clouds to the Earth's surface.
- Precipitation is intermittent, and its occurrence depends on temperature and weather conditions (IPCC, 2007).
- In Nepal, precipitation patterns vary significantly across the nation in both space and time. (Pokharel et al., 2020).





- The 2023 Annual Climate Summary Report by the Government of Nepal's Department of Hydrology and Meteorology (DHM) states 2023 was one of the warmest years since 1981.
- According to the 2023 Annual Climate Summary Report by the Government of Nepal's Department of Hydrology and Meteorology (DHM), the country recorded the eighth-lowest annual precipitation since 1981.

In today's context, climate change is a pressing global concern, and its consequences are felt most by developing countries such as Nepal (Devkota, 2014). One of the most visible impacts of rapid temperature rise is an increase in the intensity and frequency of extreme weather events. In Nepal, floods and landslides have become particularly prevalent owing to the country's complex geographical landscape and its exposure to severe climatic conditions (Dulal, 2010).

#### **Extreme Events**

A changing climate alters the frequency, intensity, duration, and timing of weather events, which often results in extreme events. Weather events with values significantly straying from the mean (such as heat waves, droughts, and floods) are statistically less likely to occur and are called extreme events (IPCC, 2012).

For example, the absence of precipitation and excessive evaporation from the soil can lead to a drought (IPCC, 2012; McKee et al., 1993). Extreme events can be classified into rapid-onset events and slow-onset events. In Nepal, both slow-onset events and rapid-onset events are increasing in frequency, intensity, and magnitude (MoFE., 2021b) with impacts on agriculture, water resources, biodiversity, and ecosystems.



Rapid-onset event may be a single, discrete event that occurs in a matter of days or even hours. The examples of rapid-onset events are floods, fire, landslides, intense rainfall, erratic rainfall, hailstorms, heatwaves, etc.

#### **Slow-Onset Extreme Event**



Slow-onset events evolve gradually from incremental changes occurring over many years or from an increased frequency or intensity of recurring events. It includes sea level rise, increasing temperatures, desertification, loss of biodiversity, land and forest degradation, glacial retreat, and related impacts, ocean acidification, salinization, etc.

#### **Rapid-Onset Extreme Event**

In Nepal, natural disasters related to extreme meteorological events result in significant economic and human loss and damage annually. Floods, erratic rainfall, intense rainfall, and landslides are examples of rapid-onset events (MoHA & DPNet-Nepal, 2015) that cause heavy economic and human loss.

For example, the floods in Manang (in the Taal and Dharapani area) were caused by the monsoon of 2021, which brought more than double the average annual rainfall of 300 mm in just a few days. These floods destroyed 56 houses, damaged another 200, and left hundreds of people displaced. It caused massive loss of life, livelihoods, and property, and also disconnected access to the district's headquarters of Chame (Pradhan et al, 2022).

#### **RAPID-ONSET EXTREME EVENTS: MELAMCHI RIVER FLOOD 2021**

In June 2021, the Melamchi River in central Nepal experienced a catastrophic flash flood that caused significant destruction in the Helambu and Melamchi region of Sindhupalchowk district. The flood, primarily triggered by continuous heavy monsoon rainfall, led to massive devastation downstream (Maharjan et al., 2021), completely damaging 539 households. The flood also resulted in the loss of



one life, injuries to six individuals and the reported disappearance of 23 people (Adhikari et al., 2023). The flood also caused significant destruction to infrastructure, including bridges, a hydropower project, and the headworks of the Melamchi Water Supply Project. It also impacted agriculture and businesses such as trout, poultry, and pig farms, impacting the livelihood of the local community. In addition to the economic loss, the flood also caused non-economic loss and damage in terms of mental health, culture, mobility, education and social interaction (Parajuli et al., 2023).

#### **Slow-Onset Extreme Event**

Nepal is highly vulnerable to slow-onset disasters like Glacier lake outburst floods (GLOFs), droughts, land degradation, etc. Despite the country's high vulnerability to slow-onset disasters, these disasters are among the least studied in Nepal (PRC, 2022). Factors like droughts, unpredictable rainfall patterns, heatwaves, and rising average temperatures are intensifying slow-onset risks.

#### **DROUGHT IN UPPER MUSTANG**

The people of Sam Dzong faced significant challenges in their homeland, primarily due to water scarcity. Owing to this scarcity, the village located at 4100m above sea level in Upper Mustang was deeply impacted in terms of agricultural and livestock production and the people's overall livelihood system. Water harvesting for irrigation became increasingly difficult because of drying water sources and the destruction of resources and streams caused by flooding from irregular rainfall.



Ms. Gurung looking back at her old home at Sam Dzong (Source: NEFIN,2024)

As a result, the people of Sam Dzong had no option but to abandon their ancestral land and relocate to Namashung. The official relocation of Sam Dzong village began in 2015, and by 2019, the majority of the villagers had been fully moved to Namashung (NEFIN, 2024). As per United Nations, this is one example of the many indigenous communities worldwide impacted by climate change.

#### Impacts of Climate-Induced Disasters in Various Sectors

Nepal, characterized by its fragile mountain ecosystems and diverse climatic zones, is highly vulnerable to climate-induced disasters. As global temperatures rise, rapid climate hazards such as extreme weather events, including heavy rainfall, snowstorms, high winds, hailstorms, increased lightning, heat waves, cold waves, floods, landslides, and wildfires, are expected to increase in frequency and severity in the world and in Nepal (NAP, 2021). The impact of these hazards as per different sectors is mentioned below:

Table 1 : Climate-induced	disaster impacts in	n different sectors	of Nepal
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Sectors		Impacts
	Agriculture and Food Security	<ul> <li>Decrease in soil quality; increase in diseases and pests; heightened risk of food insecurity; and reduction in incomes.</li> <li>Shift in timing of sowing, transplanting, flowering, and fruiting of horticultural crops</li> </ul>
	Forests, Biodiversity, and Watershed Conservation	<ul> <li>Depletion of ecosystem services; changes in forest distribution and composition; biodiversity loss; and reduced production of non-timber forest products.</li> <li>Shifts in flowering and fruiting times leading to food shortages for local wildlife. Habitat loss/change for wildlife, along with an increase in alien and invasive species.</li> </ul>
	Water Resources and Energy	<ul> <li>Drying up of water resources affecting irrigation and hydropower generation with increased siltation in the rivers.</li> <li>Increased snow retreat, formation of new glacial lakes, and probability of GLOF.</li> </ul>
	Rural and Urban Settlements	<ul> <li>Damage to buildings and public infrastructure, leading to disturbance in social harmony and fabric.</li> <li>Disturbance in rural-urban linkages and nexus due to climate extreme events.</li> </ul>
	Tourism, Natural and Cultural Heritage	<ul> <li>Obstruction of trails, tourism infrastructure, and damage to archaeological sites.</li> <li>Destruction and alteration of flora and fauna habitats that negatively impact nature-based tourism.</li> </ul>

Sectors		Impacts			
	Industry, Transport, and Physical Infrastructure	<ul> <li>Damage to and destruction of physical and natural infrastructure; increased loss of jobs.</li> <li>Disruption of transportation and communication networks; impact on water availability.</li> </ul>			
	Health, Drinking Water, and Sanitation	<ul> <li>Risk of vector-borne and water-borne diseases; increased impact on mental wellbeing.</li> <li>Lack of water for drinking, sanitation, and hygiene.</li> <li>Depletion of groundwater table; higher level of water pollution.</li> </ul>			
	Disaster Risk Reduction and Management	<ul> <li>Negative impact on livelihoods because of the increase in and frequency of climate- related disasters.</li> <li>Destruction of physical, social, cultural, and financial assets.</li> <li>Loss of life and property.</li> </ul>			
	Gender Equality Social Inclusion, Livelihood and Governance	<ul> <li>Drying of water resources increases the workload and drudgery of vulnerable people and communities.</li> <li>Loss of shelter; enhanced displacement; separation of families; forceful migration; discrimination; violence; and trafficking during and after climate disasters.</li> </ul>			

(Source: MoPE (2017); GoN (2020, 2021b); MoFE (2021a); World Bank & ADB (2021); NAP, (2021))

### **CHAPTER-2**

#### What Is Loss and Damage?

The UNFCCC framework does not have an official definition of loss and damage (L&D) till date (Boyd, E., et al. 2017; ecbi pocket guide, 2023). But according to the United Nations Environment Programme (UNEP), Loss and damage refers to the negative effects of climate change that occur despite mitigation and adaptation efforts. While mitigation measures (like reducing greenhouse gas emissions) address the causes of climate change and adaptation measures (like building walls to prevent flooding) address the impacts, L&D refers to the unavoidable and irreversible impacts of climate change.



Loss and damage are categorized by the UNFCCC framework as economic and non-economic loss and damage.



#### **Economic Loss and Damage**

Economic losses can be understood as the loss of resources, goods, and services that are commonly traded in markets (UNFCCC, 2013).



Business Operations, Agriculture, Jobs & Employment, Tourism

#### **Physical Assets**



Infrastructure (buildings, bridges, roads, railways, irrigation canals, reservoirs, trails, power generation stations, dams, dykes, etc.), Property (house, land etc.)



#### Non- Economic Loss and Damage

Non-economic losses are additional losses that are not easily quantifiable in economic terms and are not tradeable in the market (UNFCCC, 2013).



#### Loss and Damage in the Context of Nepal

In Nepal, L&D is defined on the basis of the global discourse, emphasizing Nepal's ecological and social diversity (MOFE, 2021b). In 2021, the government of Nepal prepared a national framework on loss and damage and defined the term as:

"Represents the actual and/or potential negative manifestations of climate change on sudden-onset extreme events, such as heatwaves and extreme rainfall, and slowonset events such as snow loss, droughts, glacial retreat to which people in Nepal's mountains, hills, and Terai are not able to cope with or adapt to as the country's natural ecosystem, infrastructure, and institutions are overwhelmed, leading to the losses of life, livelihoods, including losses of cultural heritage."

#### **Cases of Loss and Damage in Nepal**

#### Floods And Landslides Across Country (September 2024)

Nepal experienced record-breaking rainfall from September 26 to 28, 2024, which resulted in severe flooding and landslides across the nation. The intense downpour caused widespread devastation, leading to numerous fatalities and significant infrastructure damage.

Table 2: Economic and	non-economic	loss and	damage	due to	flood an	d landslide in
September 2024						

Economic loss and damage	Consequences
Income: Impact on agriculture and livestock Physical asset: Damage of property; Impact on infrastructure	<ol> <li>A total of 65,380 hectares of agricultural land and 58,772 hectares of paddy fields were affected. Additionally, 26,698 livestock were lost.</li> <li>Damage to houses, schools, hospitals, highways, communication services, irrigation, and other infrastructures:         <ul> <li>5,996 houses fully destroyed, 13,049 partially destroyed and 807 families displaced.</li> <li>9 major highways across Nepal severely impacted</li> <li>44 bridges damaged, 11 hydropower operational plants, 15 hydropower plants under construction, and 2178 distribution sectors impacted and 1,678 water supply projects damaged.</li> </ul> </li> </ol>
Non-economic loss and damage	Consequences
<b>Individual:</b> Loss of human life, impact on health, and human mobility	A total of 249 human casualties, with 18 people reported missing and 177 injured. Disrupted transportation networks, affecting connectivity, trade, and the movement of goods and people in Koshi, Bagmati, and Karnali Provinces.
Source: NDRRMA, 2024	

#### Melamchi Flood (June 2021)

The flood in the Melamchi River basin was triggered by heavy rainfall upstream, which caused a chain reaction along the river. This triggered landslides, blocked the river, and caused a buildup of debris, creating a cascading impact that triggered massive economic and non-economic loss and damage (PRC, 2023).

Economic loss and damage	Consequences
<ul> <li>6 bridges damaged</li> <li>Damage to agricultural land, trout farming, livestock, irrigation canals, water mills, and poultry farming</li> <li>Damage to land and houses</li> <li>Impact on tourism</li> </ul>	<ul> <li>Restricted the movement of people, impacted the market value chain.</li> <li>Affected income and employment opportunities.</li> <li>Loss of houses and land contributed to the highest economic loss.</li> <li>Disruption of business led to a decrease in the influx of tourists affecting income and employment opportunities in the flood-affected areas.</li> </ul>
Non-economic loss and damage	Consequences
<ul> <li>Human casualties</li> <li>Health impacts</li> <li>Impact on mobility and social interaction</li> <li>Impact on education</li> <li>Impact on culture and religion</li> <li>Impact on natural resources and ecosystem services</li> <li>Migration</li> <li>Impact on gender roles</li> </ul>	<ul> <li>One fatality and 23 missing</li> <li>Mental stress and waterborne diseases</li> <li>Damaged bridges and roads disrupted mobility</li> <li>Disruptions in education due to damage to school infrastructure</li> <li>Damage to community-gathering buildings and parks limiting social interaction</li> <li>Loss of cultural heritage sites and disruption of cultural practices and traditions</li> <li>Loss of biodiversity</li> <li>Forced migration</li> <li>Women experienced an increased care burden of household chores and securing food and water</li> </ul>

#### Table 3: Economic and non-economic loss and damage due to Melamchi flood

Source: Parajuli et.al., 2023

#### Karnali Flood (August 2014)

A slow-moving weather system brought heavy rainfall to the Babai and Karnali river catchments between August 14 and 15, 2014. The intense rain triggered extraordinary flooding, resulting in substantial economic and non-economic loss and damage in different sectors.

Economic loss and damage	Consequences
<ul> <li>Impact on business, agriculture, infrastructure, and property</li> </ul>	<ul> <li>Loss of agricultural production, which led to a loss of income and an increase in poverty.</li> <li>Damage to infrastructures like irrigation canals, school buildings, and roads.</li> </ul>
Non-economic loss and damage	Consequences
Life	<ul> <li>Stress and anxiety among children due to fear of flood.</li> </ul>
Health	Rise in waterborne diseases; increased morbidity     on infants' normal growth.
Human mobility	Increased male migration to India.
Cultural heritage	<ul> <li>Flooding triggered relocation for many, which led to a loss of rituals and cultural practices.</li> </ul>
Indigenous knowledge	<ul> <li>Traditional weather and flood prediction practices.</li> </ul>
Societal/cultural identity	<ul> <li>Loss of dignity, identity, and security, exposure to uncertainties, increase in child labor and child marriage.</li> </ul>
Biodiversity	<ul> <li>Gradual extinction of bird species, frogs, bees, and an increase in new diseases, agricultural pests, and invasive alien plant species.</li> </ul>
Ecosystem services	<ul> <li>Loss of community, leasehold, and impacts on agriculture forests, soil fertility, flood mitigation, and water recharge.</li> </ul>
Source: Practical Action (2021)	

#### Table 4: Economic and non-economic loss and damage due to 2014 Karnali flood



#### CASE STUDY OF NON-ECONOMIC LOSS OF MELAMCHI RIVER FLOOD, 2021

The Melamchi and Helambu are located in the central hills of Nepal at an elevation ranging from 712 to 5,747 meters above sea level. The Melamchi River flood on June 15, 2021, was caused by a combination of anthropogenic and climatic factors.

An in-depth study of cultural loss and damage in the two



areas revealed significant impacts on both tangible and intangible cultural heritage. It was observed that adaptation efforts faced substantial barriers, including financial constraints, governance issues, and social-cultural challenges. Additionally, there was a clear prioritization of livelihood restoration over cultural rehabilitation in both areas. While local initiatives and municipal efforts put an emphasis on cultural restoration, they were insufficient to address the scale of loss and damage. Thus, a comprehensive approach that integrates cultural recovery into adaptation strategies is critical.

### **CHAPTER-3**

#### Policies on L&D in NepaL

#### National Framework on Climate Change-Induced Loss and Damage (L&D)

The concept of loss and damage is relatively new in Nepal and is gaining increasing interest in climate change negotiations, policy, and research (MoFE, 2021b). In 2021, Nepal adopted the National Framework on Climate-Change-Induced Loss and Damage to understand and conceptualize the country's context on loss and damage. The framework presents approaches, methodologies and tools necessary to assess the unavoidable, avoidable and avoided risks associated with climate change impacts.



Source: MoFE. (2021)

Figure: Climate change-induced L&D Framework of Nepal

# Loss and damage consideration in Disaster Risk Reduction (DRR) and climate change policies

Although existing climate change and DRR policies have recognized loss and damage, there are no specific tools to measure it. The table below highlights the policies relevant to loss and damage in Nepal.

#### **Table 5: Loss and damage in National Policies**

PoLICY		E.		!
Policy/ Framework	Year	Policy Focus	Loss and Damage consideration	Limitation in policy on loss and damage
A. Climate cha	nge pol	icies in Nepal		
<ul> <li>National Framework on Climate Change- Induced Loss and Damage (L&amp;D)</li> </ul>	2021	<ul> <li>Gives the definition of loss and damage in context of Nepal and prioritizes the need for international finance, methodological framework and approaches to avoid climate risks.</li> </ul>	<ul> <li>Provides detailed understanding on the national context of loss and damage.</li> </ul>	<ul> <li>No clear guidance on how to proactively move forward</li> </ul>
<ul> <li>National Adaptation Plan 2021- 2050</li> </ul>	2021	<ul> <li>Focus on adaptation actions to address climate vulnerabilities and risks while also aims to achieve national economic and development priorities.</li> </ul>	<ul> <li>Plans to minimize human loss and damage through enhanced resilience and adaptation measures</li> </ul>	<ul> <li>No Loss and damage priority program in the document</li> </ul>
• Nationally Determined Contribution	2020	<ul> <li>Outlines sector wise commitment on mitigation measures and adaptation plan based on the Paris Agreement to address climate change.</li> </ul>	<ul> <li>Commits to develop a National Strategy and Action Plan on climate- induced loss and damage by 2025 under adaptation component</li> </ul>	<ul> <li>There is no specific commitment to develop loss and damage strategy and plan by 2025</li> </ul>

• National Climate Change Policy	2019	<ul> <li>Focuses on adaptation and mitigation by mainstreaming climate change in all the sectors, mobilizing financial resources, research and technology while also ensuring gender equality and social inclusion.</li> </ul>	<ul> <li>Acknowledges that there is lack of research and basic data on climate induced loss and damage</li> <li>Considers loss and damage under Disaster risk reduction and management policy</li> <li>Includes provision of research on economic and non-economic loss and damage and regularly update climate induced loss and damage data</li> </ul>	<ul> <li>No separate sectoral or working policy on loss and damage</li> </ul>
<b>B. DRR policies</b>	in Nep	al		
<ul> <li>Disaster Victim Rescue and Relief Standards (Seventh Amendment) 2077</li> </ul>	2020	<ul> <li>It provides emergency assistance and relief to disaster victims.</li> </ul>	<ul> <li>Rescue and emergency relief supplies</li> <li>Compensation and the amount of compensation varies with geography, family size, and severity of loss and damage.</li> </ul>	<ul> <li>There is no specific provision on climate induced disaster</li> </ul>

<ul> <li>Disaster Risk Reduction and anagement Act and Regulation s 2076</li> </ul>	2019	<ul> <li>It is a legal framework to amend and unify the prevailing law on reduction of disaster risks by managing all natural and non- natural disasters risk reduction activities from federal level to local level.</li> </ul>	<ul> <li>Provisions on Post Disaster recovery program related to loss and damage (psycho-social counseling services, rescue operations, updated records of destroyed documents in time of disaster are kept, compensation to affected, etc.)</li> </ul>	<ul> <li>The act and regulations focus on overall all the disasters, there is no specific provision for climate induced disaster</li> </ul>
<ul> <li>National Disaster Risk Reduction Policy 2075</li> </ul>	2018	<ul> <li>It is an umbrella policy for Disaster Risk Reduction prepared to build safer, adaptive and resilience nation from disaster risks.</li> </ul>	<ul> <li>Provision of rescue, post disaster recovery, rehabilitation and reconstruction</li> <li>Provision of soft loan from banks and financial institutions</li> <li>Provision of Trauma care establishment in major cities</li> </ul>	<ul> <li>There is no specific provision on climate induced disaster</li> </ul>
• Disaster Assessment Guideline 2072	2015	• The guideline aims to improve the efficiency of search, rescue, and relief operation through multi- cluster initial preliminary assessment.	<ul> <li>Provision to form a sector wise cluster approach to assess post disaster impacts</li> </ul>	<ul> <li>There is no specific provision on climate induced disaster</li> </ul>

## **CHAPTER-4**

#### Loss and Damage Cost in Nepal

When it comes to vulnerability to the impacts of climate change, about 65% of the districts in Nepal rank "high to very high" (MoFE, 2021b). In recent climate-induced disasters, both economic and non-economic loss and damage have been experienced in Nepal. However, the majority of studies and assessments have been focused on economic loss and damage, with only a few assessing non-economic losses.

Year of events	Description of the study	Estimated economic loss	Non-economic loss	Title of report/ publication
2024 (September)	This assessment provides initial findings on the loss and damage caused by the floods and landslides from September 26 to 28, 2024	<ul> <li>Physical infrastructure:</li> <li>USD 288 million</li> <li>Social: USD 682,000</li> <li>Productive: USD 53 million</li> <li>Total: USD 346,238,332</li> </ul>	<ul> <li>No. of fatalities: 248</li> <li>No. of missing: 18</li> <li>No. of injured: 177</li> <li>No. of affected households: 46,095</li> </ul>	A preliminary Loss and Damage Assessment of flood and landslide (NDRRMA, 2024)
2024 (August)	This article highlights the increasing risk the Himalayan cryosphere faces, focusing on the Thame disaster.	<ul> <li>Economic loss: N/A</li> <li>Sectoral impact:</li> <li>25 houses</li> <li>1local hydropower project</li> <li>1health post</li> <li>1school</li> <li>1bridge</li> </ul>	<ul> <li>No. of displaced: 135</li> </ul>	Rethinking Himalayan Cryosphere Risk Assessment in the wake of Nepal's Thame Disaster (Lord, 2024) (NDRRMA, 2024)
2021	This study highlights the loss and damage resulting from the Melamchi river flood of June 15 2021.	<ul> <li>Melamchi:</li> <li>USD 436 million</li> <li>Helambu:</li> <li>USD 204.56 million</li> <li>Total:</li> <li>USD 640.56 million</li> </ul>	<ul> <li>Mental health impact: 85%</li> <li>Education impact: 73%</li> <li>Cultural impact: 58%</li> <li>Gender impact: 41%</li> <li>Social interaction impact: 51%</li> <li>Mobility: 40%</li> </ul>	Locally-led Assessment of Loss and Damage Finance in Nepal: A Case of Melamchi Flood 2021 (Parajuli et al., 2023)

#### Table 6: Overview of loss and damage in Nepal (1981-2024)

Year of events	Description of the study	Estimated economic loss	Non-economic loss	Title of report/ publication
2017	This study estimates the impact and recovery needs of the 2017 Terai flood	• NPR 60,716.6 million	• Loss of life	
2014	This study focuses on loss and damage due to heavy rainfall in the Babai and Karnali river catchments	• NPR 3.7 million	No. of fatalities: 222	
2014	This includes findings of a case study that investigated the loss and damage resulting from a catastrophic landslide in Jure	<ul> <li>Financial loss: USD 10,000 to USD 100,000, with additional impact on cross-border trade reaching up to nearly USD 400,000 per day</li> </ul>	<ul> <li>No. of fatalities: 156</li> <li>Psychological impact</li> </ul>	Stocktaking study on climate- induced loss and damage in Nepal (PRC,2022)
2013	This study focuses on loss by floods and landslides in three municipalities of Sudurpaschim province	• USD 388,355 (NPR 38,835,496)	<ul> <li>Tremors and post-disaster psychological distress</li> </ul>	
2002	This study examines the overall loss and damage caused by the Khanikhola landslides along with adaptive strategies of the local communities	• NPR 452,494,000.	N/A	

Year of events	Description of the study	Estimated economic loss	Non-economic loss	Title of report/ publication
1983 to 2006	This study presents an overview of floods in several rivers, its causes and consequences, and the ways to mitigate flood disasters in Nepal	• NPR 626 million	<ul> <li>On average, 299 life loss annually</li> </ul>	Floods in Nepal: Genesis, Magnitude, Frequency and Consequences (Yogacharya and. Gautam, 2008)
1983 to 1998	This study aims to discuss the types, frequencies, and magnitude of disasters with extreme weather events	Average annual loss of USD 10.7	• N/A	Recent Extreme weather events in the Nepal Himalayas (Chalise, 2002)
1985	Study reflects the economic and non- economic loss caused by Dig Cho lake outburst	• USD 4 million	• Loss of life	When the climate becomes a threat: Evidence of Climate Change Induced Loss and Damage in Nepal (DCA, 2021)
1981	This report presents the economic and non-economic loss of different glacial lake outburst floods (Zhangzanbo, Bhotekoshi, and Sunkoshi)	• USD 3 million	<ul> <li>No. of fatalities: 5</li> <li>No. of injured:191</li> </ul>	When the climate becomes a threat: Evidence of Climate Change Induced Loss and Damage in Nepal (DCA, 2021)

Sources: Lord, 2024; NDRRMA, 2024; Parajuli et al., 2023; PRC, 2022; Yogacharya and. Gautam, 2008; Chalise, 2002; DCA, 2021



#### Estimated economic loss and damage in Nepal from 1971 to 2024

- The average economic loss per year from 1971 to 2019 (48 years) amounted to USD 27.78 million (DCA, 2021). However, the average economic loss per year amounted to USD 23.10 million in just the past seven years from 2015-2022 (MoHA, 2023).
- The total estimated economic loss of seven years from 2015 to 2022 is USD 184,810,999 million (MoHA, 2023). The total estimated economic loss of three days from September 26-28, 2024 is USD 346,238,332.
- The data indicates a rising economic loss in recent years.

#### CASE STUDY OF ECONOMIC LOSS OF MELAMCHI RIVER FLOOD, 2021

Melamchi and Helambu represents the hilly region of Nepal, with elevations ranging from 712 to 5,747 meters above sea level. The Melamchi River flood on June 15, 2021, was caused by a combination of anthropogenic and climatic factors.

The study by Parajuli et al. (2023) reported significant impacts on infrastructure, business, houses, land, crops and livestock, leading to



an economic loss of USD 436 million in Melamchi and USD 204.56 million in Helambu, totaling USD 640 million in economic losses, according to data from the Helambu Municipality. For comparison, the total annual budget of both municipalities is USD 14.3 million. This scenario indicates that even a decade's budget will not be sufficient to address the needs of the affected communities.

The study also found non-economic loss and damage prevalent among the affected communities as 85% reported mental health impacts, 73% agreed having an impact on education, 58% on cultural impact, 41 % on gender specific impact, 51% on social interaction and 40% on mobility.

## **CHAPTER-5**

#### **Addressing Loss and Damage in Nepal**

Addressing L&D is a complex and context-specific challenge, as there is no "one size fits all" solution. The approach towards addressing L&D depends on local conditions, socioeconomic factors, and vulnerabilities. Proactive steps at the local level are crucial, as the local communities directly experience the impacts of loss and damage. However, local actions alone are not sufficient and thus must be strongly linked to global efforts to ensure access to resources and prompt decision-making. The discourse surrounding L&D needs to be localized, and the local and global link must be viewed from the lens of climate justice (Ojha et al., 2023).

#### Table 7: Potential solutions (though not limited) for addressing the loss and damage.

Avert/Minimize	Address	
Focus on short-term climate risks     Minimize short-term climate risks by     strengthening early warning systems,     emergency preparedness, social and financial     protection and rick assessment	Adapt to the changing climate     Adjust practices to cope with residual risks     by focusing on both economic and non-     economic loss.	
People centric approach     Empower local communities to design     adaptive strategies and design solutions     through proactive planning	Emergency relief     Timely rescue and relief for impacted     communities is crucial to minimize the impact     post-disaster.	
Adjust adaptation pathways Interventions are required for known risks to reduce severity.	<ul> <li>Finance         Allocate financial resources for response and recovery, including emergency funds for immediate relief and insurance scheme from both international (grant promotion) and national sources.     </li> <li>Monitoring and evaluation         Establish mechanisms to track recovery progress, evaluate the effectiveness of interventions, and adapt strategies as needed.     </li> <li>Coordinated response         Effective coordination among different government bodies to address the     </li> </ul>	
Nature-based solutions     Nature-based solutions such as reforestation,     agroforestry, and green infrastructure		
Knowledge and innovation     Research, monitoring and technology     advancement at both local and national		
level. Focus on Nationally Determined Loss and Damage along with Economic Loss and Damage.		
Build and upgrade policy and its	governance and institutional barriers	
<b>implementation</b> Formulate and implement policies on loss and damage. Loss and damage must be recognized as both a political priority and a governance responsibility at local and national levels.	<ul> <li>Localize L&amp;D discourse</li> <li>Localizing L&amp;D discourse ensures that global policies and solutions reflect local priorities.</li> </ul>	

Source: DCA. 2021; Ojha et al., 2023; WFP (2023); ReliefWeb. (n.d)

### **CHAPTER-6**

#### **International Context of L&D**

The idea of "Loss and Damage" was first introduced in the context of the UNFCCC at COP13 in Bali (2007) and it gained recognition through the Paris Agreement at COP21 (2015). Details of major decisions regarding L&D in international climate negotiations are summarized below:



Source: (UNFCCC, n.d)

Figure: Major decisions regarding L&D in UNFCCC

#### **Limits to Adaptation**

The concept of L&D emerged from the understanding that both mitigation and adaptation have their limits. As the scale and speed of climate change exacerbates, loss and damage occur when mitigation and adaptation solely cannot avert, minimize, or address "un-avoided and unavoidable" consequences.

In simple terms, 'limits to adaptation' refers to the point beyond which adaptation strategies or measures become ineffective. These limits to adaptation are context-specific and influenced by socio-cultural values.

#### **Hard and Soft Limit**

**Hard Limit:** No adaptive actions are possible to avoid intolerable risks (Klein et al., 2014). These risks typically occur in biophysical systems, such as sea level rise, glacial retreat, glacial lake outburst floods (GLOFs), biodiversity loss, and drying water sources, all resulting in unavoidable loss and damage.

Soft Limit: Currently, options to intolerable avoid risks through adaptive action (Klein et al., 2014) are unavailable, but possibilities may emerge in the future through innovation. new resources. and change in attitudes. These risks arise in social systems due to a lack of financial resources, technical knowledge,



(Source: Climate Change 2014: Impacts, Adaptation, and Vulnerability)



<sup>(</sup>Source: Delayed, abrupt and unjust: An institutionalist perspective on limits to climate change Adaptation, 2024)

capacity, and weak governance. Thus, loss and damage may be avoidable but remain unavoided due to these constraints. Even after addressing some of these adaptation gaps, residual risk may remain.

#### **Adaptation Limit: Showcasing Hard Limit**

#### **Existential risk of emao island in VANUATU**

The Republic of Vanuatu is an island nation consisting of multiple islands located in the South Pacific Ocean, around 1,750km east of Australia. Emao Island of Vanuatu faces existential risk due to land loss, diminishing natural resources and agricultural challenges compounded by infrastructural damage that affects livelihoods and ecosystems. Extreme events particularly tropical cyclones are increasing the risks associated with sea level rise, seasonal rainfall changes



(Source: IFSD)

and ocean acidification. Notable impacts were felt during Tropical Cyclones Pam (2015), Harold (2020) and Lola (2022) alongside Kevin and Judy in 2023 which prompted states of emergency across many provinces. Projections indicate that sea levels could rise between 22 – 37 cm by 2050 and between 68- 122 cm by 2100 under high emission scenarios. This rise is leading to significant coastal erosion including the loss of Marou village's local cemetery.

#### Fund for Responding to Loss and Damage

The Paris Agreement recognizes the importance of averting, minimizing, and addressing loss and damage but fails to include the financial mechanism of compensation and liability. In 2022, at COP 27 in Sharm el-Sheikh, the Fund for Responding to Loss and Damage (FRLD) was established. It was operationalized in 2023 at COP 28 in Dubai. At COP28, pledges for the fund reached USD 700 million. The World Bank has been selected as the secretariat to the FRLD and is expected to start financing projects in 2025. The fund is designed to support developing countries that are particularly vulnerable to climate change in responding to economic and non-economic loss and damage associated with the adverse effects of climate change.

Provision for operationalizing FRLD		
Purpose	<ul> <li>To assist vulnerable developing countries to the adverse effects of climate change.</li> </ul>	
Scope of the fund	<ul> <li>Address economic and non-economic loss and damage.</li> <li>Support the development of national response plans, improve climate data and information, and promote equitable and safe human mobility through displacement, relocation, and migration.</li> </ul>	
Governance and institutional arrangements	<ul> <li>Accountable to and function under the Conference of the Parties (COP) and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).</li> </ul>	
Operational modalities	<ul> <li>Will reduce unnecessary bureaucratic hurdles to accessing resources.</li> </ul>	
Eligibility	<ul> <li>Developing countries that are particularly vulnerable to the adverse effects of climate change.</li> </ul>	
Country ownership and access modalities	<ul> <li>A national authority or contact point to manage and carry out activities, projects, and programs.</li> <li>The Board has various modalities to facilitate access to the Fund's resources.</li> </ul>	
Source: UNFCCC (2023)		

#### Table 8: Summary on the provision for operationalizing funds for responding to L&D

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