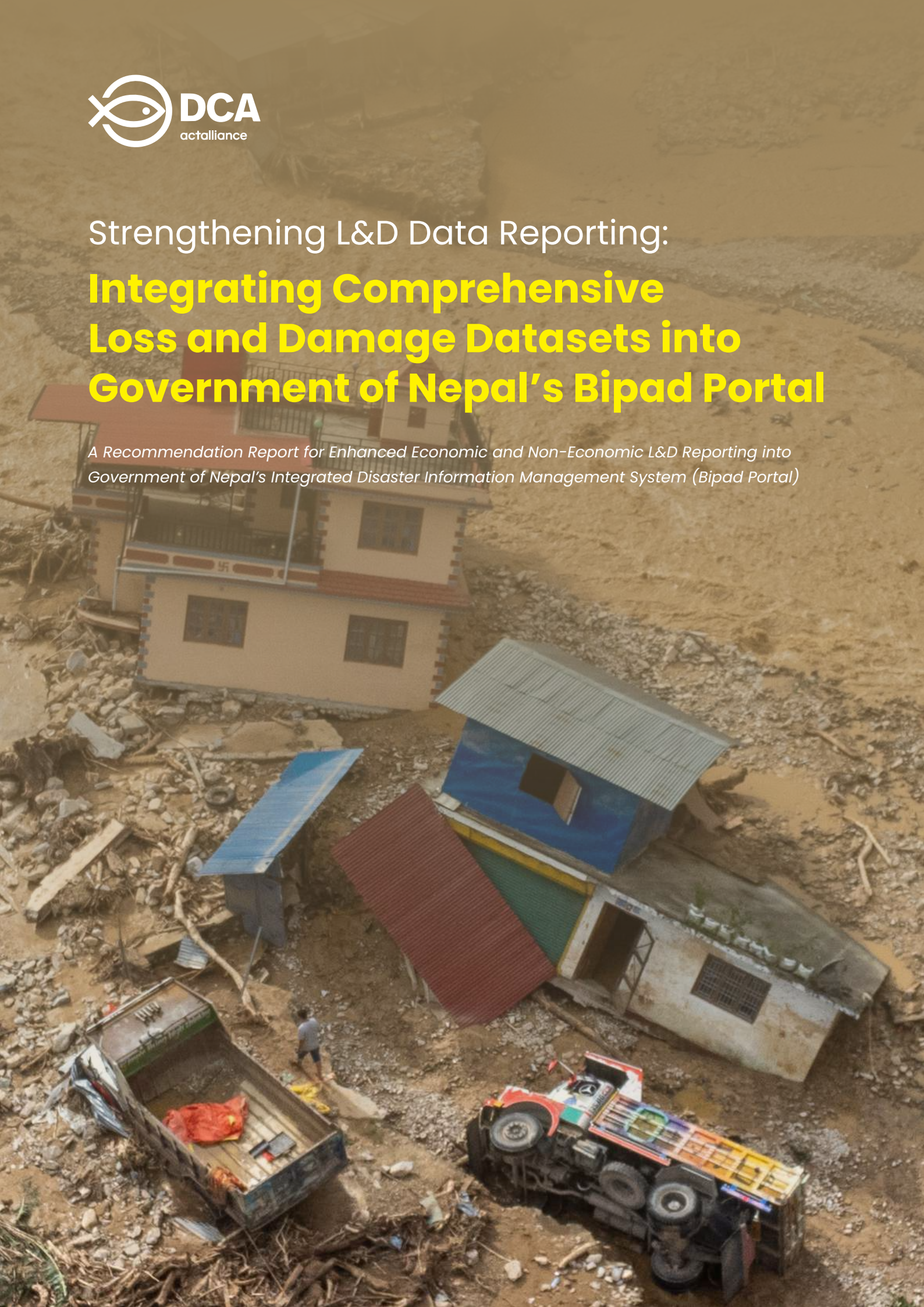




Strengthening L&D Data Reporting: **Integrating Comprehensive Loss and Damage Datasets into Government of Nepal's Bipad Portal**

*A Recommendation Report for Enhanced Economic and Non-Economic L&D Reporting into
Government of Nepal's Integrated Disaster Information Management System (Bipad Portal)*



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Acronyms

Acronym	Full Form
COP	Conference of the Parties (to the UNFCCC)
DHM	Department of Hydrology and Meteorology
DIM	Disaster Information Management
DMG	Department of Mines and Geology
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
ELD	Economic Loss and Damage
GIDC	Global Inventory of Disaster Costs
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Flood
ICIMOD	International Centre for Integrated Mountain Development
KII	Key Informant Interview
LAPA	Local Adaptation Plan of Action
L&D	Loss and Damage
LEOC	Local Emergency Operations Center
MoFE	Ministry of Forests and Environment
NAPA	National Adaptation Programme of Action
NDC	Nationally Determined Contributions
NELD	Non-Economic Loss and Damage
NEOC	National Emergency Operations Center
NDRRMA	National Disaster Risk Reduction and Management Authority
NPR	Nepali Rupee
PEOC	Provincial Emergency Operations Center
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus
SFDRR	Sendai Framework for Disaster Risk Reduction
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
WIM	Warsaw International Mechanism for Loss and Damage
YI-Lab	Youth Innovation Lab

Executive Summary

The concept of Loss and Damage (L&D) in climate change has gained significant attention, particularly with the establishment of the Loss and Damage Fund at COP27 to address both economic and non-economic losses in vulnerable nations. In Nepal, climate-induced hazards like floods, droughts, and landslides disproportionately affect marginalized communities, especially in rural areas. However, national disaster management systems, among having other loopholes in the L&D reporting pathways itself, often overlooks indicators especially those of non-economic losses, limiting recovery support for affected communities. This study aims to recommend strategies for enhancing the Bipad Portal (Nepal's National Disaster Information Management System) to integrate and visualize both Economic Loss and Damage (ELD) and Non-Economic Loss and Damage (NELD) data. The objective of this study is to support the strengthening of disaster risk reduction, management, and compensation at all levels of government, by making the most of the existing DIMS. The study evaluates current mechanisms, identifies gaps in integrating ELD and NELD data, and proposes framework and methods to improve the portal's ability to collect, visualize, and use comprehensive L&D data.

The Bipad Portal relies on data from the Disaster Risk Reduction (DRR) portal, sourced from Nepal Police reports. However, challenges remain, including underutilization, lack of standardized data formats, and incomplete integration of disaster loss data. While the portal tracks economic losses, it misses non-economic losses such as mental health impacts, human mobility, and cultural disruptions. Also, limited data granularity, such as the absence of geo-tagging and demographic indicators, reduces the portal's effectiveness for targeted response efforts. The study also highlights institutional coordination gaps that hinder effective data collection and decision-making. Various bodies involved in disaster data collection often work in silos, leading to fragmented and delayed responses. Technological and resource constraints, such as manual data entry, slow reporting times, and a lack of geo-tagging capabilities, further limit the portal's potential. It also, explores methodologies like Nepal's National Framework, the World Weather Attribution initiative, and the ECLAC methodology to guide the integration of scientific and country-specific approaches into the Bipad Portal for improved disaster reporting. To address these issues, a more integrated, user-friendly app is recommending standardized format included mobile app for real-time data collection, including geo-tagging, multimedia uploads, and offline capabilities.

1. Introduction

1.1 Understanding the Bipad Portal

Bipad Portal is the national integrated Disaster Information Management System (DIMS), spearheaded by the Ministry of Home Affairs and hosted by the National Disaster Risk Reduction and Management Authority (NDRRMA). As an innovative WebGIS platform, Bipad Portal is designed to bring a systemic transformation in disaster governance, aligning with global principles such as the Sendai Framework for Disaster Risk Reduction (SFDRR). It is built upon the concept of creating a national portal embedded with independent platforms for national, provincial, and municipal governments with bottom a up approach of disaster data partnership. The data integrated in the system has potential to enhance all the phases of the DM cycle and also facilitates disaster communication and post-disaster event coordination. The portal is designed to be user-centric which ensures that it caters to a wide range of audiences, including disaster managers, planners, policymakers, and researchers, making it an indispensable tool for informed decision-making at all tiers of governance.

Bipad's strength lies in its trial focus on historical data analysis, real-time decision-making and long-term planning. For disaster managers tasked with swift responses to hazards, it offers fast, actionable information that prioritizes efficiency over detail. Meanwhile, planners and policymakers engaged in risk-informed development benefit from the platform's detailed and reliable datasets. The platform is hosted within the Government Integrated Data Centre (GIDC), with independent subdomains assigned to all 753 municipalities, 77 districts, and seven provinces. This multi-tiered setup enhances accessibility and promotes localized ownership of disaster governance (YI-Lab, 2020). The Damage and Loss module, a critical feature of the platform, records disaster impacts and has great potential to provide critical insights for immediate response while also laying the groundwork for robust disaster risk reduction, recovery planning, and long-term resilience strategies.



1.2 Context and Background of the Study

Amongst the nine modules of Bipad Portal, the incident module captures disaster incidents and their immediate impacts. This capability ensures a systematic approach to recording damages and losses, in damage and loss module of the Portal contributing to informed decision-making and response strategies at the federal, provincial, and local levels (YI-Lab, 2020).

With the growing emphasis on climate-induced Loss and Damage (L&D) globally, particularly after the establishment of the Loss and Damage Fund during COP27 (UNFCCC, 2022), there is an increasing need to integrate comprehensive Loss and Damage data into existing disaster management platforms like Bipad Portal. The current modules, while robust in disaster incident reporting, would benefit

from enhancements to include comprehensive data on L&D. Incorporating both Economic Loss and Damage (ELD) and Non-economic Loss and Damage (NELD) data, derived from systematic research and assessment, would enable a more nuanced understanding of disaster impacts, aligning with global DRR principles such as the Sendai Framework¹ and the commitments of the UNFCCC.

This report highlights the criticality of such integration and offers targeted recommendations for embedding L&D data into Bipad Portal, ensuring the system evolves as a holistic platform for disaster governance. By doing so, Bipad Portal could support more equitable, evidence-based approaches to disaster response and recovery.

1.3 Objective of the Study

The main objective of this study is to recommend the responsible authorities regarding the enhancement of Loss and Damage reporting via the Bipad Portal with inclusion of ELD and NELD data. This enhancement will strengthen Bipad's capacity to support data-driven decision-making for Disaster Risk Reduction and Management (DRRM) and Loss and Damage compensations at all levels of government.

Specific Objectives:

1. To evaluate the existing mechanisms and identify gaps in the integration of ELD and NELD data into Nepal's disaster reporting systems, including the Bipad Portal.
2. To recommend actionable strategies and a structured framework for enhancing the Bipad Portal's capacity to collect, integrate, and visualize comprehensive L&D data.

¹ About the Sendai Framework <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework>

1.4 Rationale

To improve the comprehensiveness of disaster assessments and enhance the country's disaster risk management system, it is essential to strengthen the integration of L&D data into the Bipad Portal. While the portal currently includes basic ELD data, it does not capture the full spectrum of losses, especially the non-economic dimensions, which are critical for understanding the

total impact of disasters. By incorporating more inclusive and comprehensive data, the Bipad Portal can provide a more holistic view of disaster impacts, covering all sectors—social, economic, and environmental. This study provides recommendations and strategies to guide the government in making more informed, equitable, and responsive decisions.

1.5 Method and Approaches

To provide detailed recommendations and strategies to enhance the Bipad Portal and integrate comprehensive L&D data, a systematic approach is adopted. The portal's existing features, including user access, reporting mechanisms, data download, and data integration, are assessed to identify gaps and challenges, particularly in incident reporting. Key Informant Interviews (KII) with stakeholders working in DRRM provided insights into current practices and challenges. A review of the L&D assessment and integration frameworks evaluates its alignment with global best practices and local needs. Using these insights, an inclusive and enhanced L&D-enabled portal is envisioned, followed by actionable recommendations for technical enhancements, policy adjustments, and capacity building to address identified gaps and improve usability.

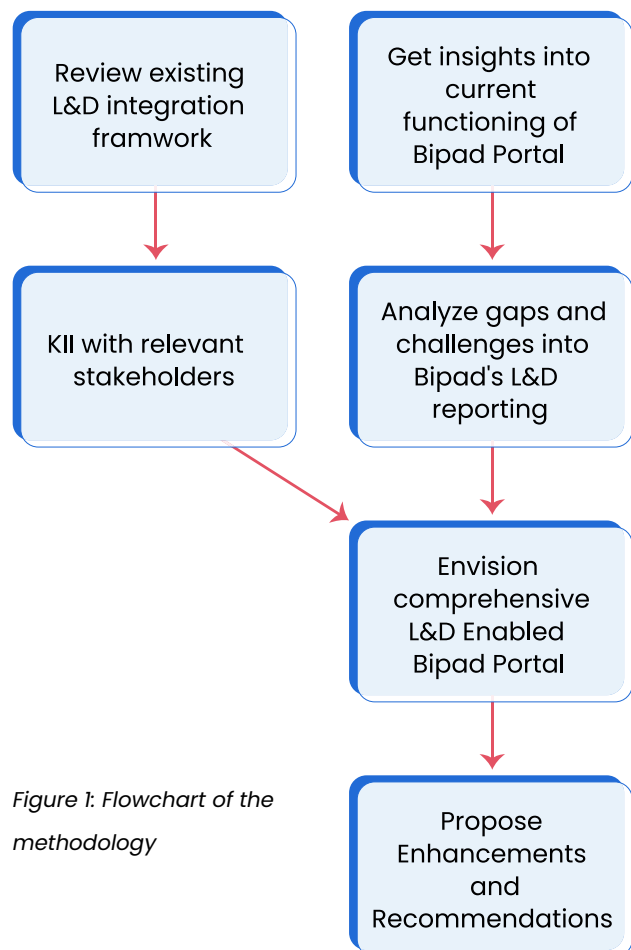


Figure 1: Flowchart of the methodology

2. Decoding Loss and Damage (L&D)

2.1 What is Loss and Damage?

In the context of disasters, Loss and Damage refers to the physical and economic consequences of disaster events, such as infrastructure destruction, property loss, agricultural damage, and human casualties. This includes the direct impacts on buildings, roads, utilities, and the resulting loss of livelihoods and economic activities. L&D in disasters is typically focused on the

immediate aftermath, and the impacts are often quantifiable in monetary terms, such as asset damage, lost income, or displaced populations. In this document, the focus is on the Damage and Loss data within the DRR Portal and Bipad Portal. The goal is to propose strategies for integrating more inclusive data, addressing both disaster-related L&D and climate-induced L&D.

LOSS AND DAMAGE ASSOCIATED WITH THE IMPACTS OF CLIMATE CHANGE

United Nations
Framework Convention on
Climate Change

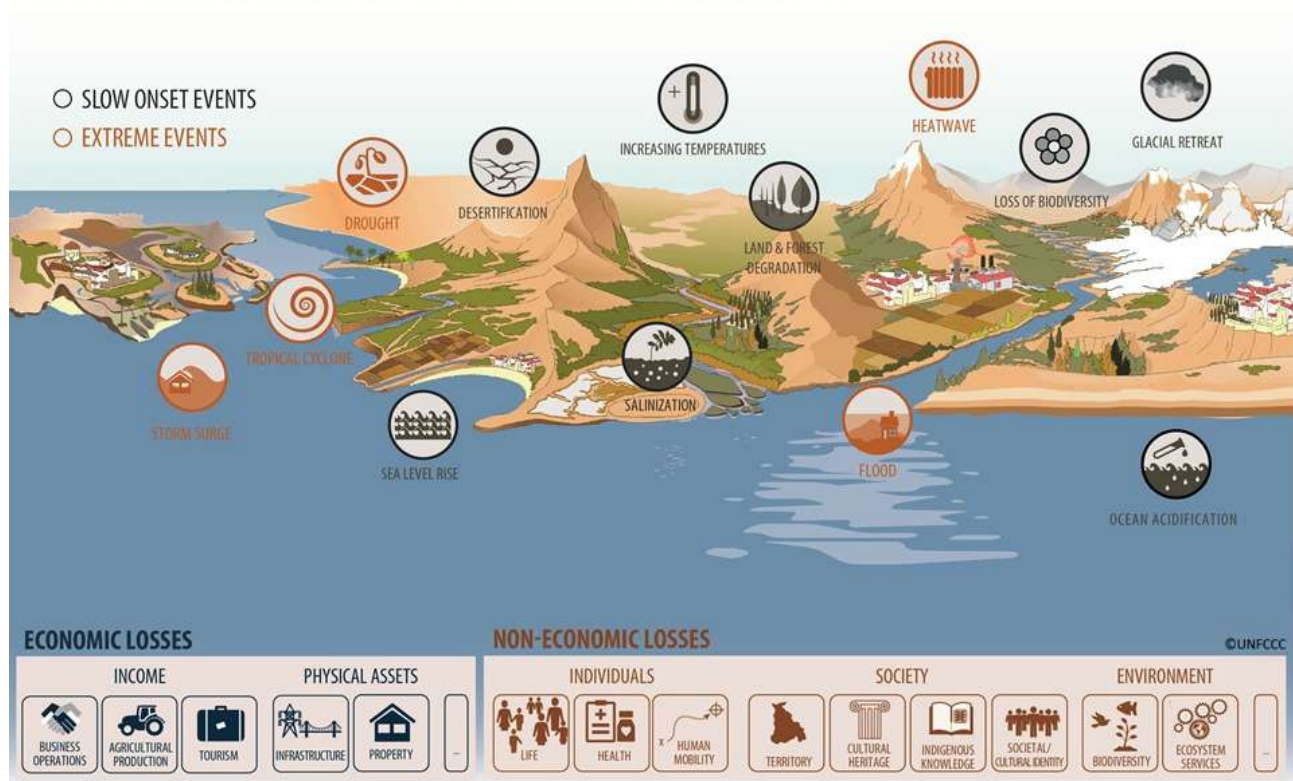


Figure 2: Loss and Damage under the UNFCCC process

In terms of Climate Change, there is no globally accepted definition within the United Nations Framework Convention on Climate Change (UNFCCC)². Broadly, it refers to the impacts of climate change that cannot be mitigated or adapted to, resulting in both tangible and intangible consequences. UNFCCC has classified loss and damage as economic and non-economic. It refers to economic losses as the loss of resources, goods, and services that are commonly traded in markets, such as physical assets like infrastructure, property, or income sources, including agricultural production, tourism, and business operations. Non-economic losses refer to aspects that are not commonly traded in markets, such as life, health, human mobility, territory, cultural heritage, indigenous knowledge, societal or cultural identity, biodiversity, and ecosystem services (UNFCCC, 2013) both generically and through concrete examples of current practice; and implications of the different assessment techniques for the identification

of non-economic risks and the design of practical adaptation actions to manage them. Consistent with the UNFCCC work programme on loss and damage, the main focus of this technical paper is on developing countries that are particularly vulnerable to the adverse effects of climate change. What are non-economic losses and why are they important? 2. Climate change will affect a wide range of social, economic and environmental systems. It has become common to split these impacts into non-economic losses and economic losses. Economic losses can be understood as the loss of resources, goods and services that are commonly traded in markets. As such, economic losses should be recorded by and manifest in the system of national accounts (although they may not be in countries with large informal economies. While the precise definitions of losses and damages remain subject to ongoing discussion, there is a consensus on categorizing them based on specific characteristics, as outlined in the table below:

Table 1: Classification of Losses and Damages by Nature and Context

Category	Definition	Examples
Irreversible Loss	Impacts that cannot be recovered or restored, representing permanent changes.	Loss of lives due to floods, submersion of islands, extinction of species, glacier melting.
Recoverable Damage	Impacts that can be repaired, restored, or compensated through interventions.	Rebuilding infrastructure, re-cultivating flooded agricultural lands, repairing homes.
Economic L&D	Losses and damages related to market-valued goods, services, or income sources.	Decline in agricultural yield, loss of tourism revenue, damage to transport infrastructure.
Non-Economic L&D	Impacts beyond market valuations, involving cultural, environmental, and societal elements.	Loss of cultural heritage, displacement of communities, loss of indigenous knowledge.
Avoidable L&D	Losses and damages are preventable through effective mitigation and adaptation measures.	Flooding mitigated through better drainage; heat-related deaths reduced by early warning systems.
Unavoidable L&D	Impacts that persist despite adaptation and mitigation efforts due to the inevitability of some climate processes.	Sea-level rise, desertification in arid regions, glacier retreat.

2 About UNFCCC <https://unfccc.int/>

2.2 Global Perspectives on Climate Induced L&D

In the global scenario, loss and damage (L&D) due to climate-induced disasters has become an increasingly urgent issue. The economic impacts of climate-induced disasters have surged globally, with average annual losses from disasters reaching \$313 billion between 2011 and 2020 (World Bank, 2021). In 2022 alone, losses from natural disasters worldwide were estimated at \$275 billion, with uninsured losses accounting for over \$125 billion (Swiss Re., 2023). Building on these figures, the concept of L&D has evolved to be recognized globally as the third pillar of climate action. Originating from the UNFCCC negotiations, L&D represents the adverse impacts that occur despite the best Mitigation and adaptation efforts. While mitigation and adaptation have been in global discussions for centuries, Loss and Damage did not emerge until the Bali Action Plan in 2007 COP 13, where ‘loss and damage’ was first introduced as part of enhanced action on adaptation, including: Disaster reduction strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change and risk management and risk reduction strategies, including risk sharing and transfer mechanisms such as insurance.

Globally, the establishment of the Warsaw International Mechanism (WIM) in 2013 marked a pivotal moment in addressing L&D within the UNFCCC framework. The WIM focuses on

enhancing knowledge, strengthening dialogue, and mobilizing support to minimize and address L&D in vulnerable countries. At the same time, civil society and academic movements have championed the integration of L&D into broader climate justice discourses, arguing for greater accountability and compensation from high-emitting nations (Huq et al., 2013). Loss and Damage continued to evolve in UN negotiations in subsequent COPs. The Paris Agreement, adopted at COP 21, included Article 8, which outlined areas of cooperation and facilitation to enhance understanding, action, and support. It also stated that the WIM would operate under the authority and guidance of the CMA. At COP 25 (2019), the WIM underwent its second review and was further strengthened. Recent developments have highlighted the growing significance of Loss and Damage. At COP 27, the decision to establish a Loss and Damage Fund marked a milestone in global climate negotiations. This fund aims to provide financial support to the most affected countries, recognizing the disproportionate vulnerabilities of the Global South. At COP 28 (2023), the L&D Fund was operationalized, with commitments from several developed countries, resulting in a total accumulation of almost \$700 million. These milestones highlight the global community’s growing acknowledgment of the urgent need to address Loss and Damage, offering hope to vulnerable nations for meaningful action on the climate crisis and advancing the principles of climate justice.

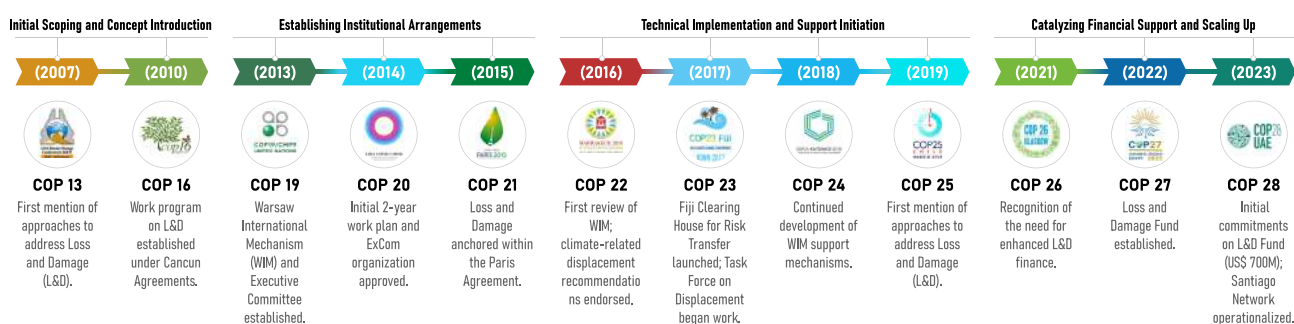


Figure 3: L&D Evolution in UNFCCC negotiations, Timeline following COP's

2.3 Nepal's Climate Vulnerability and L&D Context

Nepal's unique geography, ranging from the low-lying Terai plains to the towering Himalayas, makes it one of the most climate-vulnerable countries in the world. Its susceptibility to floods, landslides, droughts, and glacial lake outburst floods (GLOFs) is exacerbated by climate change, which amplifies the frequency and intensity of extreme weather events. Floods in Nepal are particularly associated with the summer monsoon rains, often leading to devastating impacts. With more than 6,000 rivers and rivulets spanning over 45,000 km, these water systems provide critical support for irrigated agriculture and livelihoods but also cause significant damage when they overflow (Bajracharya SR, 2013). Nepal has experienced a rapid rise in atmospheric temperatures in recent decades, leading to climate-induced disasters such as irregular precipitation, droughts, and glacial melting. These impacts threaten the Himalayan range, ecosystems, and glacial lakes, increasing the risk of glacial lake outburst floods. Climate change has also adversely affected forests, biodiversity, human health, tourism, infrastructure, and livelihoods, with recurring disasters like floods, landslides, wildfires, and windstorms causing significant loss of life and property annually (National Climate Change Policy, 2019).

The National Adaptation Programme of Action (NAPA) 2010 identified key vulnerabilities: 29 districts were ranked as highly susceptible to landslides, 22 districts to drought, 12 districts to GLOFs, and 9 districts to flooding. One notable example of institutional failure contributing to disaster is the Koshi embankment breach,

which affected 3.5 million people across Nepal and India, showcasing the compounded risks of climate-induced hazards and governance challenges (Dixit, 2009).

In addition to physical risks, the socio-economic implications of climate change further strain Nepal's resilience. The reliance of a significant portion of the population on climate-sensitive sectors like agriculture makes economic losses inevitable during extreme events. Non-economic losses, such as displacement, loss of cultural heritage, and disruption of community identity, also highlight the need for comprehensive Loss and Damage (L&D) frameworks in the national context. Studies have shown that marginalized and indigenous communities bear the brunt of these impacts due to limited access to resources and adaptation options (Regmi et al., 2016)

In Nepal, a significant proportion of disasters are climate-induced. Around 65% of annual disaster-related deaths are attributed to such disasters, with water-induced events like floods and landslides being the most frequent and devastating. These climate-related events cause extensive damage to infrastructure, agriculture, and human lives. For instance, in extreme years like 2017, floods in the Tarai region alone resulted in an economic loss equivalent to 2.08% of Nepal's GDP. The impact of these climate-induced disasters is expected to increase in the future as climate change intensifies weather patterns (MoFE, 2021).



The Melamchi Flood, which occurred in 2021, resulted in an estimated total economic loss of almost USD 5 million (Parajuli et al., 2023).

The 2024 floods in Kanchanpur District, Nepal, caused an estimated economic loss of NPR 1.57 billion, with Dodhara Chandani Municipality alone reporting a loss of NPR 120,390,827 in the agriculture sector, amounting to 174% of its annual budget for fiscal year 2024/25 (NDRRMA, 2024).

Similarly, the preliminary Loss and Damage Assessment of the September 2024 floods and landslides estimates a total loss of NPR 46,684,318,550, with significant impacts on physical infrastructure, social sectors, and the productive sector, underscoring the critical need for immediate recovery and reconstruction efforts (NDRRMA, 2024). The growing frequency and severity of climate-induced disasters in Nepal highlight the urgent need for robust climate action and effective disaster risk management strategies to mitigate future losses.

In response to these challenges, Nepal has been actively addressing climate change since becoming a Party to the UNFCCC in 1994. The National Adaptation Program of Action (NAPA, 2015) and subsequent Local Adaptation Plans for Action (NAPA, 2011), have been instrumental in integrating climate adaptation into local development and enhancing the resilience of vulnerable communities. The Community-Based Adaptation Plan, supported by civil society and private sector stakeholders, complements these efforts.

Key initiatives include the formulation of the Climate Change Policy (2011, updated in 2019) to guide national actions and strategies such as the National REDD+ Strategy for reducing emissions from deforestation and forest degradation, and the Climate Change Budget Code to monitor expenditures. The establishment of the Climate Change Council, chaired by the Prime

Minister, and the Climate Change Management Division under the Ministry of Forests and Environment ensures policy coordination and implementation. Nepal is also engaged in international frameworks like the Kyoto Protocol, Paris Agreement, and the Sendai Framework. Efforts to update its Nationally Determined Contributions (NDCs) and access international climate finance are ongoing, with programs targeting high-risk areas and communities for adaptation measures (National Climate Change Policy, 2019).

Back in 2021, with the recognition of the importance of systematic data and an organized mechanism to assess the full extent of Loss and Damage (L&D), the Ministry of Forests and Environment (MoFE) has developed a National Framework on Climate-Induced Loss and Damage (L&D) Assessment. This framework seeks to integrate local complexities into global processes under the United Nations Framework Convention on Climate Change (UNFCCC). It addresses the cascading impacts of climate change, including hazards such as landslides, floods, glacier retreat, and forest fires, which disrupt local hydrological systems and socio-economic contexts (MoFE, 2021). Civil society organizations, institutions, and academia are actively engaged in research and advocacy on Loss and Damage (L&D), contributing to the development of policies and frameworks and advocating for the implementation of existing ones.

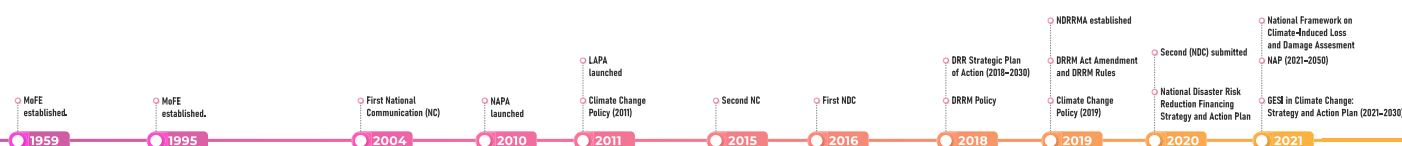


Figure 4: A timeline of major climate and DRR Related policies in Nepal

2.4 Understanding Nepal's Framework for Climate-Induced Loss and Damage

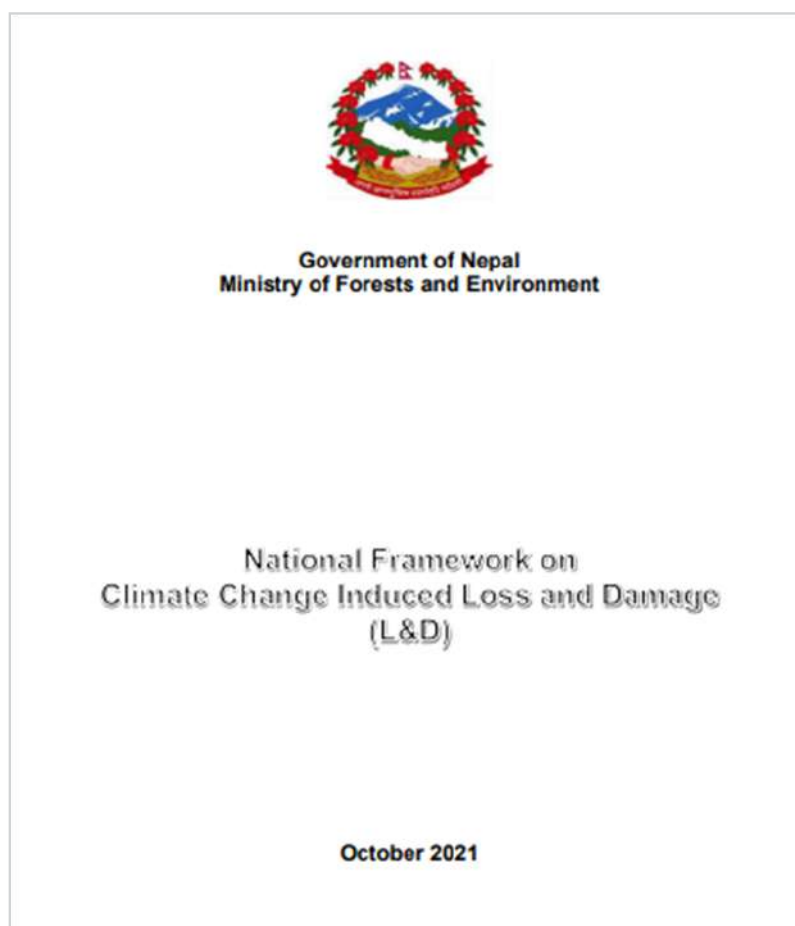
The global discourse on Loss and Damage (L&D) remains relatively nascent in the context of climate action, with limited global frameworks and consensus on the issue. However, Nepal has made some strides by developing a national framework for assessing Climate-Induced Loss and Damage, which was introduced by the Ministry of Forests and Environment in 2021. This framework is particularly valuable as it provides a localized definition and approach to assessing both economic and non-economic losses arising from climate change. While there

is no universally accepted definition of Climate-Induced Loss and Damage, the National framework offers a contextualized definition that reflects the country's unique vulnerabilities. It outlines the impacts of both sudden-onset extreme events, such as heatwaves and extreme rainfall, and slow-onset events like droughts, snow loss, and glacial retreat. The framework recognizes 15 climate-induced disasters in Nepal and provides indicators for quantifying Economic Loss and Damage (ELD) as well as some for Non-Economic Loss and Damage (NELD).

Figure 5: National Framework on Climate-Induced L&D, 2021

“Represents the actual and/or potential negative manifestations of climate change on sudden-onset extreme events, such as heatwaves and extreme rainfall, and slow-onset 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, and cultural heritage.”

-L&D Definition in National Context According to the Framework



Although the current framework has some limitations, it holds great potential for guiding research, policy, and action on climate-induced L&D in Nepal. The methodologies being developed by government

institutions, academic bodies, and research organizations often reference this framework as the foundational document for understanding and addressing L&D in the country.

3. Unpacking the Bipad Portal

3.1 Current Data Sources and Bipad Portal's Mechanisms

Nepal's current disaster incident reports mechanisms can be sourced through platforms such as DesInventar and the DRR Portal. DesInventar provides a comprehensive dataset on damage and loss from disasters between 1971 and 2013, including indicators such as human casualties, property loss, infrastructure damage, and economic losses. The data is sourced from various channels like newspapers, the Department of Water-Induced Disaster Prevention (DWIDP), and special bulletins. While DesInventar covers events like earthquakes, floods, landslides, and droughts, the DRR Portal, managed by the National Emergency Operation Centre (NEOC), hosts more recent data starting from 2011. The DRR Portal collects incident-related data such as geographical information, human and economic loss indicators, and damage indicators, but it has several gaps, one being inadequate representation of non-economic indicators to give a full picture of L&D context. Furthermore, the Nepal Police has developed a data collection format for incident reporting that incorporates many globally recommended indicators but faces challenges in effective implementation, particularly in capturing comprehensive economic loss data (YI-Lab, 2020). The data visualized at the Bipad Portal are sourced through the DRR Portal.

The Bipad Portal is designed with a multi-tiered structure to support Disaster Risk Reduction and Management (DRRM) at the national, provincial, and local levels with respective subdomain access and system management. This decentralization fosters ownership and

enhances tracking of DRRM progress, while maintaining data privacy at different levels. The Bipad Portal data ecosystem follows a hybrid approach with both top-down and bottom-up data collection mechanisms.

The legal and policy framework that supports the Bipad system is underpinned by several key documents, including the Disaster Risk Reduction and Management (DRRM) Act, 2017, the Constitution of Nepal, 2015, and the Local Government Operation Act, 2017. These frameworks define the responsibilities and authority of local, provincial, and federal governments in disaster management. Additionally, the National Strategic Action Plans, 2015–2030, provide the strategic guidelines for DRRM across various levels of governance. These legal mandates not only ensure that Bipad Portal operates within a formal structure but also guide its role in strengthening disaster resilience, accountability, and decision-making through consistent data collection and reporting mechanisms. Moreover, international commitments related to disaster management and climate change adaptation are also incorporated, ensuring Nepal's alignment with global disaster risk reduction frameworks (YI-Lab, 2020).

Currently, the Bipad Portal's system assumes that the damage occurs during and immediately after the disaster. It is a total or partial destruction of physical assets, the disruption of basic services and damage to sources of livelihood in the affected area and the loss in terms of human, livestock or economic that usually happens during the

event or within the first few hours after the event which is a direct loss. Indirect loss has not been considered yet into the system. As the first responders to incidents, Nepal Police holds a huge responsibility to collect and maintain credible database of the incidents. For this purpose, it is crucial to first check and verify the data from Nepal Police, before the data is

made available to all tiers of the government. However, one of the key challenges remains the standardization of data formats across platforms, especially with the diverse types of data being collected from various sources. Hence, for now only Nepal Police holds the authority to add and validate the Damage and Loss data.



3.2 How L&D Module on Bipad Works: A System Overview

The Bipad Portal consists of nine modules: Dashboard, Incident, Real-time, Profile, Risk Info, Data Archive, VisRisk, IBF and Damage and Loss. Currently, data for the Damage and Loss module is primarily sourced from the DRR portal. Nepal Police report incident details to the NEOC, which updates the DRR portal. This data is linked to the Bipad Portal, where it is visualized as maps, charts, and tables. Users can compare disaster data between provinces, districts, or municipalities. Nepal Police can also directly record loss data in Bipad Portal under categories such as people, family, infrastructure, livestock, and agriculture. Officials authorized to edit incident forms can input or adjust data, while NEOC

verifiers review and comment or approve it. Loss forms become accessible after saving incident details and are disaggregated by factors such as age, gender, and type of infrastructure or agriculture. Despite these functionalities, the backend loss data entry system is underutilized, and most displayed data is still fetched from the DRR portal. The Nepal Police however uses a separate template to collect comprehensive disaster loss details, including casualties, economic losses, and cultural heritage damage. This template informs the data structure within Bipad Portal but has not been fully integrated or optimized for broader access (YI-Lab, 2020).



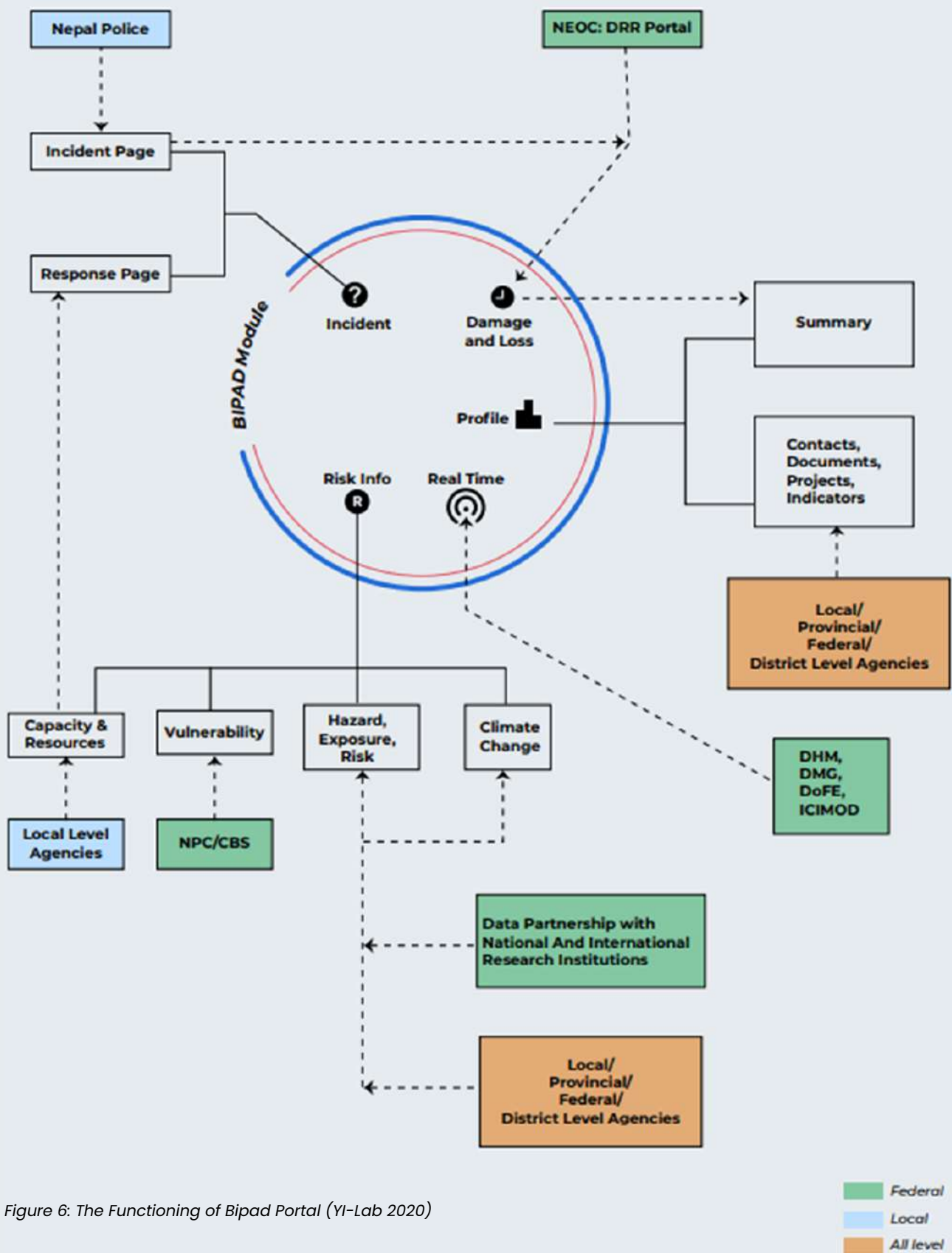


Figure 6: The Functioning of Bipad Portal (YI-Lab 2020)

3.3 The existing gaps

3.3.1 Challenges in aligning existing reporting indicators with the National Framework for Climate-Induced L&D

Before delving into the technical gaps within the National Disaster Information Management System i.e Bipad Portal, it is essential to address broader challenges in Nepal's current reporting framework for loss and damage (L&D). The Nepal Police, as primary responders to disasters and authorized entities for uploading and validating data into the national portal, play a critical role in shaping the L&D reporting landscape. An analysis comparing the Nepal Police's data collection format, the DIMS data input structure, and their alignment with the National Framework for Climate-Induced L&D Indicators reveals notable gaps.

While some sectors, such as housing impacts and certain economic losses, are adequately captured, critical areas like non-economic losses (e.g., loss of cultural heritage,

displacement trauma, and ecosystem services) and numerous infrastructure impacts (e.g., hydropower plants, water systems, and communication networks) which are listed as indicators in the National Framework on Climate-Induced L&D are entirely omitted from both reporting formats. Also, livestock impacts and production losses, including medicinal plants, receive only partial attention. These gaps are partly because the current formats are designed for general disasters, but they still limit the ability to fully capture the specific impacts of climate-induced loss and damage. As these are the only nationally standardized and routinely implemented reporting mechanisms, their limitations significantly impede informed policymaking and the development of effective response strategies.



Table 2: Nepal Police and Current DIMS Reporting and their alignment with the National Framework for Climate Induced L&D

Sector	National Framework for Climate-Induced L&D Indicators	Inclusion in Nepal Police Reporting Format	Inclusion in DIMS Indicators
Housing Impacts	Public Houses Fully Damaged	✓	✓
	Government Houses Partially Damaged	✓	✓
	Private Houses Fully Damaged	✓	✓
	Private Houses Partially Damaged	✓	✓
Livestock Impacts	Cattle Loss	✓	X
	Displaced Sheds	✓	X
Non-Economic Losses	Loss of Cultural Heritage	X	X
	Displacement Trauma (Mental Health, Social Impact)	X	X
	Loss of Ecosystem Services	X	X
Economic Losses	Estimated Loss (Monetary Value)	✓	✓
	Property Loss	✓	X
	Loss of Business Income	X	X
	Loss of Agricultural Products (Crops, Fisheries)	✓	X
Production	Paddy, Wheat, Millet, Potatoes, Vegetables	✓	X
	Maize, Fruit, Others	✓	X
	Livestock Loss	✓	X
	Medicinal Plants	X	X
Infrastructure	National Highway, Feeder Roads, District Roads, City Roads	✓	X
	Bridges, Culverts, Trails, Suspension Bridges	✓	X
	River Trained	X	X
	Hydropower Plants, Transmission Pylons/ Lines, Micro-hydro Plants	X	X
	Watermills, Solar Plants, Hybrid Plants, Biogas Plants, Windmills	X	X
	Canals, Gravity System, Storage Tanks, Intake/Pipeline	X	X
	Rainwater Harvesting, Tanks, Tube-wells, Toilets	X	X
	Fiber Cable Line, Mobile Towers	X	X
Natural & Cultural Heritage	Temples, Monuments, Historical Locations	X	X
	Locations Under Threat	X	X

3.3.2 Challenge Due to Lack of Standardized Data

A significant challenge in Loss and Damage (L&D) reporting arises from the absence of a standardized format or template for data collection. This issue extends beyond the Bipad Portal and affects the whole coordination among the local bodies responsible for collecting first-hand L&D data after disasters. Currently, the methods employed to determine losses for post-disaster relief and recovery vary widely and are often ad hoc. For example, one municipality might quantify L&D based solely on the number of houses affected, while another could use more detailed metrics, such as differentiating between partial and full damage or considering building

materials. These inconsistencies create significant challenges for data analysis and delay rescue and relief processes.

While the Bipad Portal currently uses the Nepal Police's format for data collection—a relatively comprehensive approach—there is still room for improvement. To address existing data gaps, the portal could evolve into a guiding tool for standardized data collection at the local level. By incorporating a structured and uniform template into its system, the Bipad Portal could ensure that data from diverse local bodies is comparable, consistent, and ready for integration into national disaster response mechanisms.

“As a researcher engaged in quantifying scientific loss and damage (L&D) data, the lack of a standardized reporting format causes significant challenges in ensuring consistency, accuracy, and comparability of data across local, provincial, and national levels. This gap not only hampers the integration of data into systems like the Bipad Portal but also limits the scientific community's ability to generate robust evidence to inform disaster risk reduction and recovery policies.”

– **Rijan Gajurel, NHSRP National Coordinator, CRS Nepal**

“Health institutional losses, deaths, and injuries are reported in a categorized manner for ministerial records, but no standardized format is currently available for such data reporting in DIMS or quantification of such losses.”

– **Amrit Gurung, HEOC, Ministry of Health and Population (MoHP)**

3.3.3. Gaps in Comprehensive Loss and Damage (L&D) Data

The current Damage and Loss module form on the Bipad Portal includes basic indicators for economic loss and verified impacts, such as agricultural and infrastructure losses, destroyed or affected houses, and disaggregated data on human fatalities, injuries, and missing persons. However, it does not account for non-economic losses (NELD) like mental health impacts, records of human mobility, disruption of cultural practices, or loss of biodiversity. These aspects are vital for understanding the broader social and environmental implications of disasters, particularly in vulnerable communities. For

example, after floods in Nepal's Terai region, families experienced not only material losses but also significant emotional stress and displacement, disrupting traditional livelihoods and social networks. The absence of NELD in the portal skews the data towards a narrow economic perspective, which underrepresents the full scope of climate-induced hazards and their long-term consequences. A comprehensive L&D framework, aligned with international standards such as those under the UNFCCC Loss and Damage Mechanism, is essential to address these gaps effectively.



“There is no data inventory within relevant ministries to track past incidents or damage and loss, which makes addressing these challenges more difficult.”

– **Monika Jha, Department of Mines and Geology**

3.3.4. Limited Data Granularity and Contextual Relevance

The portal does not capture key granular data points, such as geo-tagged hazard locations, detailed demographic impacts (e.g., age, gender, disability), and socio-economic indicators like poverty status. This limits the portal's ability to deliver actionable insights. For instance, during the monsoon floods of 2022, localized impacts on marginalized groups, such as low-income Dalit communities, were not effectively recorded, making it challenging to prioritize relief and recovery efforts. Furthermore, the portal's disaster categorization framework, based on Nepal's Disaster Risk Reduction and

Management Act (2017), outlines 42 types of hazards without distinguishing between climate-induced and non-climate-induced disasters. This lack of distinction hinders the ability to clearly associate specific disasters with climate change impacts, thereby complicating efforts to integrate reliable L&D data, particularly for accessing international climate funds. Without a nuanced understanding and categorization of climate-induced disasters, policymakers and practitioners face challenges in leveraging the platform for evidence-based climate action and advocacy.



“While real-time data from sim-data loggers is synchronized with the Bipad Portal through an API, minor data gaps and inaccuracies in mapping within the system remains an issue”

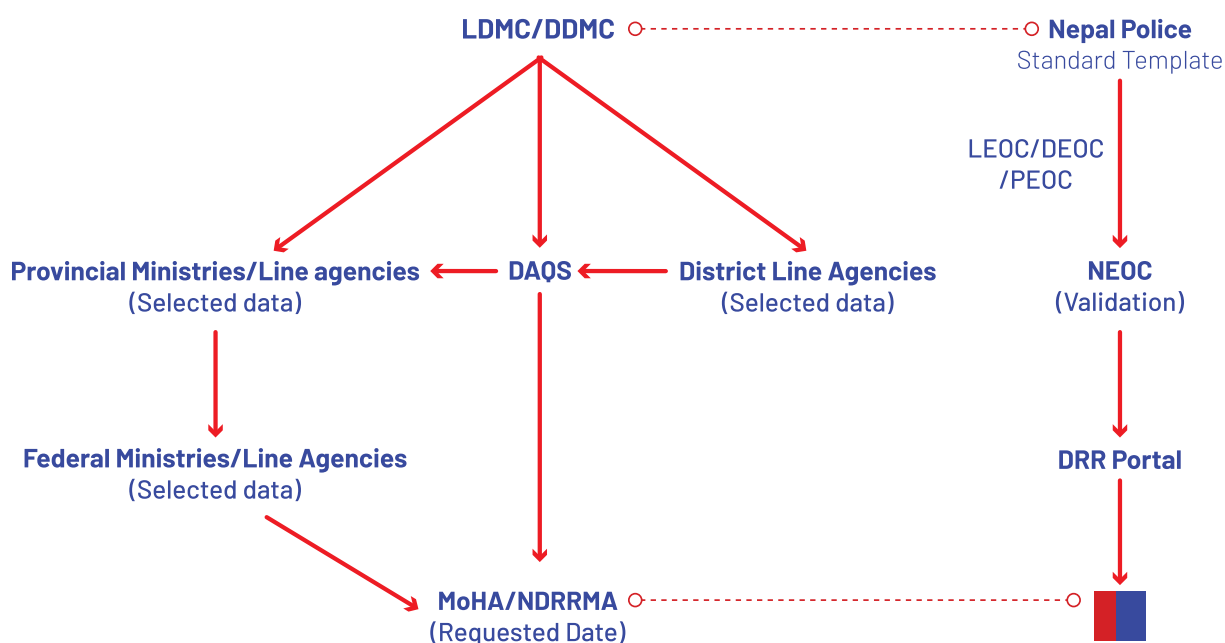
– **Rojan Lamichhane, Meteorologist, DHM**

3.3.5. Operational and Institutional Coordination Gaps

Multiple institutions, including the Local Emergency Operation Centers (LEOCs), Provincial Emergency Operation Centers (PEOCs), the National Emergency Operation Center (NEOC), various local disaster risk management committees, as well as provincial and national ministries, play a role in disaster data collection. Each entity gathers information to fulfill specific purposes such as maintaining institutional records, coordinating rescue and relief operations, managing disaster response funds, or addressing other administrative and operational needs. However, these entities often operate in silos, coordinating only when necessitated by emergencies.

For example, sectoral data collected by the Ministry of Health and Population, which is comprehensive and covers critical NELD as well may not be integrated into the portal, leaving critical gaps in information about health crises or agricultural losses during disasters. This fragmented approach delays decision-making and reduces the overall efficiency of disaster response and recovery. Furthermore, the lack of a streamlined protocol for data sharing and validation across federal, provincial, and local levels exacerbates this issue. Without enhanced institutional coordination, the portal cannot achieve its intended goal of providing a unified, comprehensive view of disaster impacts.

Existing Data Collection & Integration Pathways



Note: The flowchart is based on Key Informant Interviews (KIIs) conducted during the study.

Figure 7: Existing Data Collection & Integration Pathways and Gaps

“There is no unified approach for data integration or reporting among local bodies, police, and federal agencies like NDRRMA. The reliance on ad-hoc communication channels, such as WhatsApp groups, underscores the lack of institutionalized systems for streamlined disaster data sharing.”

– Sandesh Adhikari, DRR Focal Person, DAO Kathmandu

Below are the abbreviations and their corresponding full forms used in the figure for clarity:

LDMC:	Local Disaster Management Committee
DDMC:	District Disaster Management Committee
DAO:	District Administration Office
NEOC:	National Emergency Operation Center
DRR Portal:	Disaster Risk Reduction Portal
LEOC:	Local Emergency Operation Center
PEOC:	Provincial Emergency Operation Center
DEOC:	District Emergency Operation Center
MoHA:	Ministry of Home Affairs
NDRRMA:	National Disaster Risk Reduction and Management Authority

3.3.6. Technological and Resource Constraints

Disaster data is often manually collected and digitized, leading to delays of up to 48 hours in reporting. For example, after a landslide in Sindhupalchowk district, local authorities faced significant delays in updating critical data on the number of displaced families and damaged infrastructure, hampering timely rescue and relief operations. Also, the absence of geo-tagging capabilities means that hazard locations are not precisely mapped, limiting the effectiveness of mitigation strategies.

Financial constraints further hinder the ability to upgrade the portal. Developing modules or updating the incident requires significant investments in technology, training, and infrastructure. Similarly, stakeholders, including the Nepal Police and local government officials, need training to handle modern data collection tools and adhere to revised protocols. Without these advancements, the portal cannot evolve into a robust L&D-enabled platform capable of supporting Nepal's disaster resilience and recovery efforts.



“The existing manual data collection often results in significant delays in reporting and action. For instance, during disaster response, the lack of real-time digital tools means data on affected areas and victims is often incomplete or outdated by the time it is processed”

– **Subash Thapa, Armed Police Force, Nepal**

4. Integration of Comprehensive Datasets into L&D Reporting: Bridging the Gaps

4.1 Identification on Climate-Induced Hazards

Before embarking on the vision of making the Bipad Portal a tool that holds potential to effectively support the decision-making in Loss and Damage (L&D) assessments and compensations, it is critical to address a fundamental question: *How can we definitively identify whether a disaster is climate-induced?* This question resonates globally, as researchers, scientists, and institutions are working to develop robust methodologies to ascertain the connection between climate change and the occurrence of disasters. While significant progress has been made, several aspects of this identification process remain contentious and continue to be debated in the scientific community.

To address the question, a variety of methodologies have been proposed to assess whether disasters are climate-induced, each offering a unique approach to understanding the complex relationship between climate change and extreme weather events. The Bipad Portal, as the primary platform for disaster reporting in Nepal, can benefit greatly from incorporating these methodologies to improve its capacity to capture, analyze, and respond to climate-induced disasters. Here's how some of the researched methodologies can be integrated into the Bipad Portal's reporting framework:



A. The National Framework for Climate-Induced L&D

The National Framework for Climate-Induced Loss and Damage (L&D) provides a country-specific approach to identifying and assessing climate-related hazards in Nepal. While it's a framework rather than a methodology, it outlines key indicators, such as changes in temperature, precipitation patterns, and the frequency of extreme events like floods and droughts, that are essential for tracking climate-induced hazards. These

indicators, along with example scenarios for both past and future climate hazards, could be integrated into the Bipad Portal. By doing so, the portal can more effectively categorize and assess disasters, ensuring they are accurately linked to climate change. The framework also assigns relative weights to hazards based on severity, frequency, and socio-economic impacts, helping to prioritize the most critical risks.

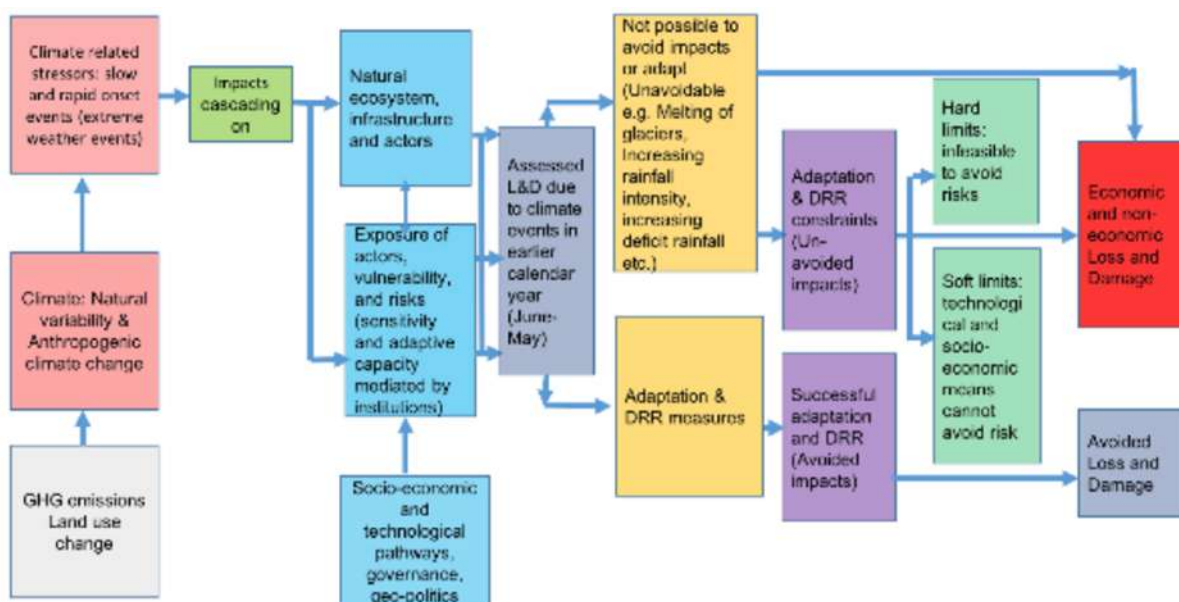


Figure 8: National framework for assessing climate change-induced L&D

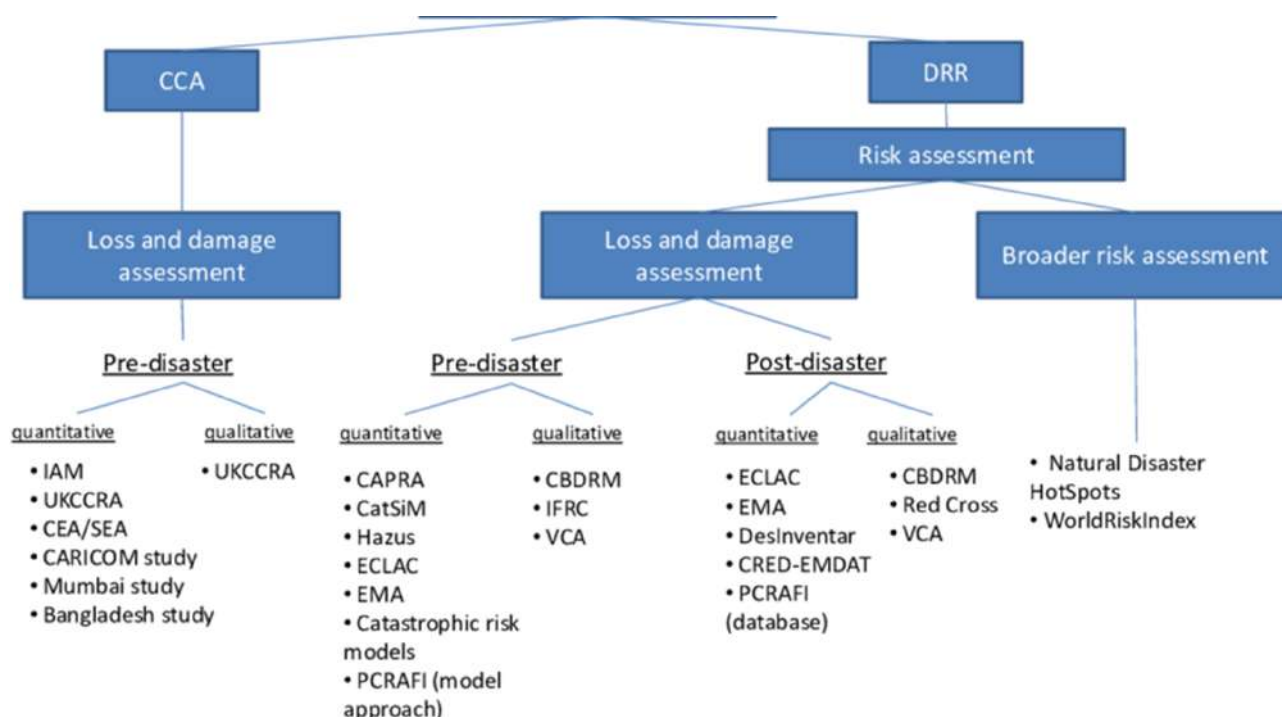


Figure 9: Overview of different approaches, methodologies, and tools for Loss and Damage (National Framework, 2021)

B. The World Weather Attribution

The World Weather Attribution (WWA)³ is an international initiative that specializes in conducting scientific attribution studies to determine the influence of human-induced climate change on extreme weather events. The WWA utilizes climate models, historical weather data, and statistical analyses to assess whether and to what extent climate change has made specific weather events such as heatwaves, floods, or droughts that more severe or more likely to occur. And the results of WWA's studies are published as reports and are often used to inform policymakers, disaster managers, and the public about the link between climate change and specific weather events.

The WWA initiative offers a scientific approach to linking climate change with extreme weather events. While attribution studies are often conducted globally, they can be referenced within the Bipad Portal to provide contextual information on the likelihood that a specific disaster event was influenced by climate change. The portal could include a feature that cross-references reported disaster events with attribution data, providing insights into the climate-related causes behind certain extreme events.

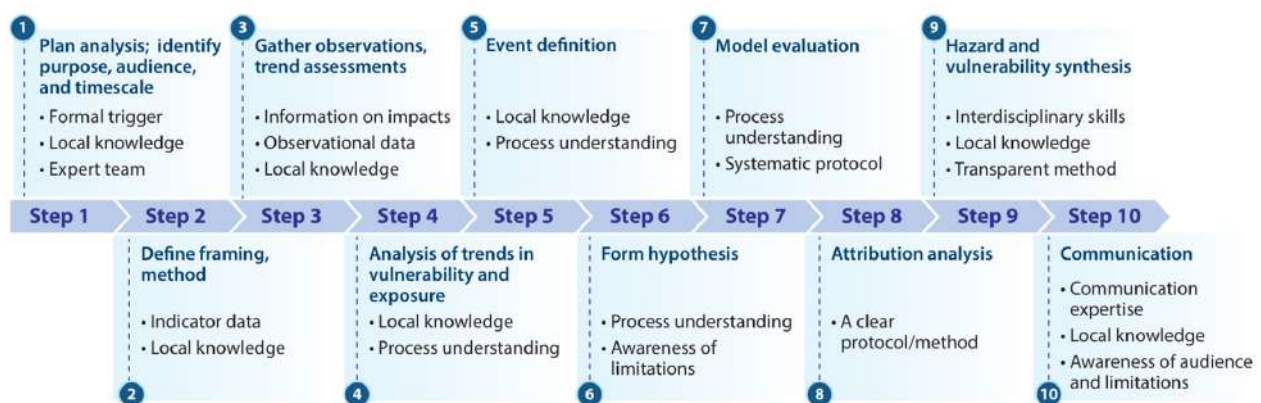


Figure 10: Method for event attribution retrieved from a WWA's Report (Otto, 2023)

³ [WWA analyses of extreme weather events – World Weather Attribution](#)

C. The ECLAC's Methodology

Economic Commission for Latin America and the Caribbean (ECLAC)⁴ is a pioneer in the field of disaster assessment and in the development and dissemination of the Damage and Loss Assessment (DaLA) methodology and Post Disaster Assessment (PDNA) methodology. Established in 1972 following the Managua earthquake in Nicaragua, the DaLA methodology has been instrumental in assessing the social, environmental, and economic effects of disasters across various countries.

The methodology has gained international recognition and has been adopted by organizations such as the World Bank for assessments beyond Latin America and the Caribbean, including in countries across Africa and Asia. Its widespread application underscores its global acceptance as a

standard for disaster impact assessment. It focuses on both the economic and non-economic impacts of disasters, considering factors such as infrastructure damage, displacement, and loss of livelihood. This methodology is also referred in National Framework for climate induced L&D of Nepal as Step 7.1. Assessing the Loss and Damage of Pre and Past Disasters in Nepal, and recommended.

The Bipad Portal could align with global practices by integrating ECLAC's indicators for both economic and non-economic losses. This enhancement would provide a more comprehensive understanding of climate-induced L&D, capturing not only physical damages but also broader impacts like displacement trauma, loss of cultural heritage, and ecosystem degradation.

4 About ECLAC <https://www.cepal.org/en/about>



4.2 Envisioning an L&D-Enabled Bipad Portal

Building on the exploration of methodologies for identifying climate-induced hazards, the next step is to envision the Bipad Portal as a comprehensive tool for Loss and Damage (L&D) reporting. This transformation would address existing gaps in data standardization, collection, and analysis, ensuring the portal becomes a robust platform for capturing the full spectrum of disaster impacts and supporting informed decision-making in Nepal. By introducing a structured and uniform template for data collection—supported by a mobile app with features such as geo-tagging and multimedia uploads—the system could standardize data gathering across municipalities. This would not only make the L&D validation more efficient but also ensure consistency, enhance comparability, and enable seamless aggregation of data at the national level. The integration of Loss and Damage into the Bipad Portal via this mobile app would not only streamline data collection but also create a centralized platform capable of capturing both economic and non-economic impacts of climate-induced disasters. Such

enhancements would fill existing data gaps, provide a holistic understanding of disaster impacts, and strengthen Nepal's capacity for equitable disaster management and climate resilience.

This envisioned system would provide comprehensive, real-time data, allowing stakeholders to address immediate disaster responses while also informing long-term climate resilience planning. For example, integrating data such as geotagged hazard locations, demographic impacts (age, gender, disability, poverty status), and economic and non-economic loss metrics would enhance data accessibility and decision-making. In practice, the app would accommodate multilingual capabilities (e.g., Nepali and English) and offline-first data collection, ensuring inclusivity for stakeholders in remote or disaster-prone regions. The upgraded portal with this function would act as a bridge between incident-level data and policy-level decision-making, fostering a holistic understanding of disaster impacts.



Here's how the envisioned portal would adapt and expand upon the existing workflow:

1. Incident Occurrence and Immediate Reporting

When a disaster event, such as a flood or landslide, occurs, it activates local response mechanisms with authorities like ward officials, police, and disaster responders swiftly addressing immediate needs. Field personnel use the mobile app to promptly document critical details of the incident, including geo-tagged locations, photos, and videos, ensuring a precise and comprehensive situational overview for effective coordination and planning.

2. Real-Time Standardized Data Collection and Submission

Information on casualties, infrastructure damage, resource needs, and economic and non-economic losses and damages is systematically gathered by local bodies. The mobile app facilitates this process by enabling the collection of detailed data in a standardized format for Loss and Damage data. This data is then seamlessly transmitted to local authorities, ensuring an efficient and streamlined flow of accurate information from the ground level to higher administrative layers for timely decision-making and response.

3. Data Transmission and Validation

The collected data is transmitted to local emergency authorities, such as LEOCs and

PEOCs, ensuring a smooth and efficient flow of information. Provincial and national agencies, such as NEOC, and relevant ministries validate this data to maintain accuracy and consistency. The mobile app's real-time submission feature minimizes delays in data transfer, allowing for timely validation.

4. Data Integration and Centralization

Once validated, the data is integrated into the DRR Portal and visualized via Bipad Portal. The portal is equipped to host both economic loss (e.g., property damage) and non-economic loss (e.g., cultural heritage impacts) metrics. This centralized repository provides a comprehensive view of the disaster's impact, streamlining decision-making and resource allocation processes.

5. Analysis, Visualization, and Decision Support

The integrated data is processed to generate actionable insights. Geospatial tools within the Bipad Portal enable visual representation of the data, such as hazard hotspots and affected regions. This visualization supports stakeholders in aligning their disaster relief efforts, fund allocation, and long-term resilience planning. The use of interactive dashboards ensures that the information is accessible and usable for diverse audiences, from local governments to national policymakers.

4.3 Proposed Processes for Incorporation

A. Conduct Stakeholder Consultations and Requirement Analysis

A thorough consultation process should be initiated with key stakeholders, including local responders, government ministries, and disaster management experts. The aim is to identify the specific data requirements for Loss and Damage (L&D) reporting. Stakeholders could provide input on the creation of a standardized format for data collection, and its mandating via policies should be discussed. Additionally, features such as geo-tagging, multimedia uploads, and role-specific permissions should be included to ensure the app meets practical needs and integrates seamlessly with existing systems.

B. Develop a User-Friendly Application

A mobile application should be designed and developed with functionalities tailored to real-time data collection and hazard reporting. The app must include standardized data fields, secure data transmission, and compatibility with platforms like the Bipad Portal. Emphasis should be placed on ease of use to ensure adoption by diverse user groups, including field personnel and government officials.

C. Integrate the App with the Bipad Portal

A robust mechanism for automated synchronization between the mobile app and the Bipad Portal should be established. This integration would involve defining specific fields for capturing both economic and non-economic losses and incorporating tools such as geospatial visualizations for real-time impact analysis. Streamlining the app and portal ensures efficient data flow and improved accuracy.

D. Pilot Test the System and Incorporate Feedback

A pilot phase should be conducted in selected municipalities to evaluate the app's functionality under real-world conditions. Feedback from end users, including responders and local authorities, should be systematically collected to refine workflows, adjust technical features, and ensure the app effectively integrates with existing reporting systems. The focus should remain on improving data quality, submission efficiency, and user experience.

E. Provide Capacity Building and Scale Nationwide

Training sessions, user manuals, and dedicated workshops should be organized to build the capacity of responders, local authorities, and national stakeholders to use the app effectively. Once the app has been refined based on the pilot phase, it should be implemented across all municipalities. Integration with national disaster management protocols and frameworks is critical for its success.

F. Monitor Performance and Align with Policies

Continuous monitoring should be carried out to assess the app's performance, focusing on data accuracy and timeliness. Updates and enhancements should be incorporated based on emerging needs or user feedback. The app should be institutionalized by aligning it with national disaster policies and frameworks, securing sustainable funding, and ensuring its operational longevity.

4.4 Potential Challenges and Mitigation Strategies

Implementing a mobile incident and L&D data reporting system and integrating it into the Bipad Portal presents numerous opportunities to enhance disaster data collection and management. However, it also introduces a range of challenges that must be proactively addressed to ensure successful implementation and long-term sustainability. Below are the key challenges anticipated and corresponding strategies to mitigate them effectively:

A. Resistance to Technological Adoption

Field responders and local authorities may resist adopting the mobile application due to unfamiliarity with new technology or lack of confidence in its utility. This challenge could be addressed by designing a highly intuitive and user-friendly application interface that caters to varying levels of technical expertise. To support adoption, comprehensive training programs should be implemented, offering both theoretical knowledge and practical, hands-on workshops. Continuous technical support and engagement activities, such as showcasing the app's success in pilot programs, would help build trust and confidence among users.

B. Connectivity Issues in Remote Areas

Unreliable internet connectivity in remote or disaster-prone regions could hinder real-time data transmission, delaying critical decision-making. This issue could be mitigated by equipping the mobile application with offline functionality, allowing users to record and store data locally until a connection is available for upload. Furthermore, collaboration with telecommunication providers to improve network coverage in vulnerable areas could ensure a more reliable communication infrastructure for long-term use.

C. Data Accuracy and Standardization

The quality of data collected during a disaster event could be compromised by inconsistent or incomplete reporting, which may affect Loss and Damage (L&D) assessments. To address this, the mobile application should enforce standardized data collection fields and formats, ensuring consistency across reports. Integrating automated validation tools that flag errors, or missing information could further improve data accuracy. Regular reviews of submitted data, accompanied by constructive feedback from field users, would help maintain a high standard of reporting over time.

D. Integration with Existing Systems

The technical complexity of integrating the newly developed application with existing systems, such as the Bipad Portal, could pose significant challenges. To address this, interoperable technologies and adherence to standardized data formats should be prioritized during development. Collaboration with IT experts familiar with the existing disaster management platforms is critical to ensure seamless integration. Extensive testing and phased rollouts, along with stakeholder consultations, would further minimize potential disruptions and ensure the integration meets user needs effectively.

E. Limited Budget and Resources

A lack of funding or limited allocation of resources could delay or restrict the development and deployment of the mobile application. To mitigate this challenge, partnerships with international development organizations, government bodies, and private sector stakeholders could provide financial and technical support. Additionally, phased implementation focusing on high-priority areas can ensure efficient resource utilization.

F. Stakeholder Coordination Issues

Coordinating multiple stakeholders, including local authorities, provincial governments, and disaster management agencies, can lead to delays and inefficiencies. This challenge could be mitigated by establishing a centralized coordination mechanism, such as a steering committee, to streamline decision-making processes. Clear roles and responsibilities should be defined, and regular communication channels must be maintained to ensure all stakeholders are aligned with project goals.



5. Pathways to Implementation

5.1 Standardized Data Collection Format

To address the inconsistency in Loss and Damage (L&D) data collection, a standardized template should be developed to capture data on common climate-induced disasters in Nepal, such as floods, landslides, and droughts. This template can be integrated into the Bipad Portal to provide accurate and consistent visualizations of L&D. The framework should include fields to capture both economic and non-economic losses, geo-tagged locations, and socio-economic demographics. Piloting studies, such as the Kanchanpur flood assessment by NDRRMA and the drought and flood assessments in Dullu and Guleriya under the “Piloting Loss and Damage Assessment

and Systems for Climate-Induced Hazards” project, already use templates that effectively capture comprehensive data, including non-economic L&D, guided by the indicators of the National Framework for Loss and Damage for Climate-Induced Hazards. It is recommended to adopt a similar template for standardization, as shown in Annex 2.

To ensure successful implementation, capacity-building initiatives, pilot testing, and policy integration of such standard templates are crucial. This will not only facilitate the effective adoption of the standardized framework but also improve disaster response efforts and support advocacy for climate finance.



Household Assessment Indicators that can be considered while developing a standardized template for comprehensive L&D.



Note: This figure highlights the intricate and interrelated indicators essential for a comprehensive assessment of loss and damage (L&D) at the household level. Adapted from NDRRMA's 2024 Kanchanpur flood household L&D assessment questionnaire, this report emphasizes the need for standardized data collection methods encompassing these indicators.

5.2 Technical Recommendations

To improve usability, the Bipad Portal and its associated applications should feature an intuitive, user-friendly interface. This design approach will ensure accessibility for all stakeholders, including individuals with limited technical expertise, fostering widespread adoption. Furthermore, the integration of the

new app and the Bipad Portal itself with existing platforms such as the DRR Portal is critical. This harmonization of data flow will prevent duplication of efforts, streamline operations, and create a unified repository of disaster-related information, enabling seamless decision-making processes.

5.3 Policy Recommendations

To ensure consistency in the collection and reporting of loss and damage (L&D) data, facilitating better comparability and analysis, Government policies should mandate the use of a standardized reporting template for all disaster-related stakeholders. Additionally, clear data privacy protocols must be established to safeguard sensitive information,

particularly regarding personal data or geo-tagged reports. A national policy or Standard Operating Procedure (SoP) on L&D data integration should also be developed to align the objectives of the Bipad Portal with national disaster management priorities. This policy will act as a guiding framework for systematic L&D reporting and governance.

5.4 Capacity Building and Training

For the effective implementation and use of the Bipad Portal, regular training programs should be organized for local and provincial authorities to familiarize them with L&D data collection procedures, app functionalities, and portal usage. These sessions would

empower stakeholders at all levels, ensuring accurate data input and effective utilization of the portal's features. Such capacity-building efforts will also promote a culture of proactive disaster preparedness and response.

5.5 Collaboration Opportunities

Collaboration with international experts in disaster analytics, such as those from the United Nations Office for Disaster Risk Reduction (UNDRR) or private technology firms, can enhance the technical capabilities of the Bipad Portal. These partnerships can provide access to advanced analytical tools and best practices for disaster data integration.

Simultaneously, engaging local governments is crucial to ensure that localized data from municipalities is accurately integrated into national systems. Strengthening these networks will ensure that disaster governance is inclusive and reflective of ground realities, bridging the gap between national frameworks and local needs.

6. Conclusion

While the Bipad Portal already serves as a critical tool for disaster data collection and visualization in Nepal, there remain significant gaps in its ability to comprehensively address Loss and Damage (L&D) reporting. The portal excels in integrating incident data, offering comparative analysis between administrative levels, and visualizing disaster impacts through maps, charts, and tables. However, its current reliance on the DRR portal for backend data, underutilization of its loss data entry system, and limited focus on non-economic loss and damage (NELD) highlight the need for targeted improvements.

Our proposed enhancements aim to transform the Bipad Portal into a more holistic, L&D-enabled platform. By integrating standardized templates for economic and non-economic data collection, supported by a mobile application with features such as geo-tagging, multimedia uploads, and offline capabilities, the system could provide a centralized and inclusive framework for disaster impact reporting. This would address existing data inconsistencies, improve granularity, and ensure the inclusion of marginalized voices and contextual nuances.

Expanding the portal's scope to account for NELD such as mental health impacts, cultural disruptions, human mobility, and biodiversity

loss would provide a more accurate representation of disaster impacts, aligning with international frameworks and policies. And expanding its capacity to integrate scientifically robust methodologies, such as those from the National Framework, World Weather Attribution, and ECLAC, would further align Nepal's disaster reporting practices with global standards and enhance the credibility of its Loss and Damage assessments. This comprehensive approach would not only enhance the utility of the Bipad Portal for disaster response and recovery but also strengthen Nepal's ability to access international climate funds and advocate for climate justice at the global stage. In summary, while the Bipad Portal is already a foundational tool for disaster management, our vision seeks to elevate its role as a transformative platform for equitable disaster resilience, integrating real-time data with actionable insights to empower decision-makers and communities alike. Achieving this vision will require coordinated efforts from all Disaster Risk Reduction and Management (DRRM) stakeholders, including local, provincial, and national governments, sectoral ministries, Nepal Police, and other relevant actors. Ensuring alignment and collaboration across these entities is essential to create a unified response system, streamline decision-making, and build trust among communities affected by disasters.

7. Annexes

Annex 1: List of Key Informants

S. N	Name of Informant	Designation	Institution
1	Monika Jha	Chief of National Earthquake Monitoring and Research Center	Department of Mines and Geology
2	Sandesh Adhikari	DRR Focal Person	District Administration Office Kathmandu
3	Amrit Gurung	Health Assistant, HEOC	Ministry of Health and Population
4	Bishnu Prasad Joshi	Disaster Management Department, Major General	Kathmandu Metropolitan City Office
5	Rojan Lamichhane	Meteorologist	Department of Hydrology and Meteorology
6	Laxman Bahadur Basnt	Nepal Police and Armed Police Force	NDRRMA
7	Reena Bajracharya	Technical Coordinator, Anticipatory Action Clinic	NDRRMA
8	Shisir Koirala	Joint Secretary	Ministry of Energy, Resource and Irrigation
9	Hari Prasad Sharma	Senior Div Engineer, Federal Affairs Branch	Ministry of Forest and Environment
10	Rijan Gajurel	National Technical Coordinator	Catholic Relief Center
11	Suraj Subedi	IT Officer	Guleriya Municipality
12	Shamsher Bahadur Shahi	DRR Focal Person	Dullu Municipality
13	Subash Thapa	Member	Armed Police Force, Nepal

Table 3: List of Key Informants

Annex 2: L&D Data Collection Format Sections (Piloted during Kanchanpur flood 2024)

Section	Subsections
Demographic Information and Indicators of Vulnerability	Municipality, Ward Number, Tole, House Number, GPS Coordinates, House Photograph, Consent, Age, Marital Status, Household Size, Household Composition, Total Female Members, Total Male Members
Health and Vulnerability	Disability in Household, Gender of Disabled Members, Number of Disabled Members, Type of Disability, Disability Identity Documents, Type of Disability Card, Diseases Experienced, Access to Healthcare Services, Distance to Healthcare Facility, Health Insurance Availability, Infant Mortality Experienced
Education Status	Literacy (male and female), Highest Education Level, Employment Status and Number
Economic Vulnerability	Primary Occupation, Land Ownership, Landholding Size, Livestock Ownership, Type of Livestock, Crop Cultivation, Primary Crops, Household Income Perception, Debt, Loan Source, Monthly Food Expenditure, Monthly Health Expenditure
Social Vulnerability	Social Protection Assistance, Crisis Support, Migration for Work, Receipt of Remittances, Victim of Crime/Violence
Hazard Exposure	Disaster Experience, Disaster Type, Asset Loss During Disaster, Lost Assets, Income Loss, Relocation Due to Disaster, Coping Mechanisms
Disaster Preparedness	Early Warning Messages, Emergency Plan, Knowledge of Safe Areas, Distance to Safe Areas, Disaster Insurance
Household Level Economic Loss and Damage	Property Damage, Household Item Damage, Income Disruption, Agricultural Loss, Livestock Loss, Tool/Machinery/Vehicle Damage, Insurance Coverage, Financial Assistance, Loans and Debts, Business Disruption, Rental Income Loss, Other Economic Losses
Non-Economic Loss and Damage	Health Impact, Physical Injuries, Post-Flood Illness, Access to health services, Damage to Health Institutions, Chronic Illness Disruption, Mental Stress/Trauma, Condition of psychological support, Cultural Losses(Assets loss, Practices Loss) Education Disruption(Number of students missed attendance, Days of Schools closed, Lost of Assets) Social Connectivity (Family displacement), Environmental Impact, Impact on natural resources, Mobility and Transportation Impact, Damage to road infrastructures, Vehicle Damage (private and public), Community Cohesion and Support, Social Displacement.

ANNEX 2: Photos from KII



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