Government of Nepal
Ministry of Home Affairs

NEPAL DISASTER REPORT

FOCUS ON RECONSTRUCTION AND RESILIENCE

SEPTEMBER 2024

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Ministry of Home Affairs (MoHA)

Singha Durbar, Kathmandu, Nepal

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NEPAL DISASTER REPORT

FOCUS ON RECONSTRUCTION AND RESILIENCE

नेपाल सरकार
गृह मन्त्रालय
GOVERNMENT OF NEPAL
MINISTRY OF HOME AFFAIRS

गृहमन्त्री
MINISTER FOR HOME AFFAIRS

25th September 24

Foreword

Nepal has made good progress in achieving the targets set by the Sendai Framework for Disaster Risk Reduction (SFDRR) and Sustainable Development Goals (SDGs) within the last six years. However, the simultaneous impacts of various hazards have presented a risk scale expanding with high frequency and intensity. Despite the onslaught of natural calamities, Nepal has learned valuable lessons and strengthened resilience, anticipating where a disaster might strike and institutionalizing early warning systems that protect lives, livelihoods and economies.

The Government of Nepal has adopted a proactive approach to disaster risk reduction and management (DRRM) and has undertaken various efforts to strengthen policy and legal frameworks, planning, organizational aspects, institutional capacities and partnerships for DRRM. The progress made is heartening and a testament to the efforts that all three tiers of government (federal, provincial and local) and communities have been dedicated to protecting human lives. Although disasters inevitably continue to affect, the efforts to preserve life have clearly borne fruit.

We are proud to report the achievements that the country has made in disaster risk reduction and management from mid-2018 until mid-2024. The Nepal Disaster Report provides a snapshot of the latest DRR progress achieved during the past six years. It also highlights some of the key challenges surrounding the issue of creating coherence in strengthening the overall disaster risk management governance by government institutions and other stakeholders at national, provincial and local levels.

As Nepal prepares to recover better together, this Report suggests policy pathways for managing disasters, preparing and issuing timely warnings and offering support and shelter, to safeguard our most vulnerable people. I hope that this *Report* can contribute to building a disaster-resilient society.

Finally, I want to thank NDRRMA and the Disaster and Conflict Management Division (MoHA) for coordinating the process of preparing the Nepal Disaster Report.

Ramesh Lekhak
Home Minister

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GOVERNMENT OF NEPAL
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Date: 25th September 24

Foreword

Nepal faces disaster events from a multitude of natural hazards; many of them are unprecedented, such as the powerful windstorm that tore through two southern districts of Bara and Parsa for the first time in Nepal's history in March 2019 claiming 29 lives and rendering hundreds homeless with huge economic losses, and the November 2023 6.4M Jajarkot earthquake that claimed 156 lives and affected 67,780 families. During July 17, 2018, and July 16, 2024, the country faced disasters such as windstorms (2019), COVID-19 pandemic (January 2020 onwards), landslides (2020—2023), unseasonal heavy rainfall (2021) and the Jajarkot earthquake, all of which resulted in casualties, damage to assets and economic losses. Hydro-meteorological and climatic hazards have become more frequent and destructive and extended to new geographic areas such as the recent floods in high altitude of Manang and Mustang districts and the upper reaches of the Melamchi river watershed.

While we cannot prevent natural phenomena, we can certainly limit their repercussions. The challenge in facing these natural hazards is to find a way to live with these phenomena. As we look back to the last five years, we can see a clear continuation of disaster trends. Nepal satisfactorily managed Post-2015 earthquake reconstruction and COVID-19 recovery involving communities and stakeholders and mobilizing support from development partners, the private sector, civil society organizations, and communities, which reflects Nepal's potential in enhancing, coping, and resilience capacity. Along with efforts to develop the capacity of security forces for disaster rescue, Nepal has adopted a Humanitarian Cluster Approach in disaster preparedness and response involving all relevant stakeholders from various sectors. The network of clusters has been extended to sub-national and local levels with necessary operating guidelines fostering harmonized initiatives in preparedness, response, and recovery.

The Government of Nepal is committed to implement international commitments on disaster risk reduction and management (DRRM) and climate change, such as the Sendai Framework for DRR (2015—2030), Paris Agreement on Climate Change, UN Sustainable Development Goals (2030), and the country's national policies, strategies, and plans have been aligned with these commitments.

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The Government has been working in a whole-of-society approach and is committed to continue coordination and collaboration with the DRRM community, development partners, and UN and international as well as national agencies to develop capacity in multiple sectors at federal, provincial, and local levels.

The Ministry of Home Affairs (MoHA) is highly pleased to bring out this edition of the Nepal Disaster Report (NDR). Covering 17 July 2018 to 16 July 2024, this report presents a wealth of information and analysis—much of it is focused on reconstruction and resilience. The report stresses that, too often, it is the most vulnerable people and the people most in need who fall through the cracks. It also calls on us to start taking seriously how people affected by crises define their own needs. In reading this NDR, one is reminded of the overwhelming impact of the COVID-19 pandemic. Colleagues from MoHA have done a commendable job consolidating data from a broad variety of sources and translating it into a document, which is both accessible and concise. The NDR 2024 also captures cross-government response and challenges faced when responding to the needs of the COVID-19 pandemic.

Emanating from the NDR is the country's will towards stronger disaster management and resilience. While the impact of the pandemic and other natural disasters is still felt to this day, the government has demonstrated its commitment to fundamentally strengthen how it manages disaster risks. The enactment of the Disaster Risk Reduction and Management Act (2017) and the implementation of the National Disaster Risk Reduction Strategic Plan of Action (2018—2030) exemplifies the government's leadership on the disaster resilience agenda and its commitment towards sustainable development. I would like to commend vital role of MoHA and NDRRMA in disaster management and the important contributions that different government officials from MoHA have made over the past several years on disaster resilience, preparedness, and response.

I hope this report will contribute to a deeper understanding of what has been achieved so far, and illuminate the possibilities for building disaster, climate, and health resilience to better protect our people, now and in the future.

September, 2024

Gokarna Mani Duwadee
Secretary
Ministry of Home Affairs

GOVERNMENT OF NEPAL
MINISTRY OF HOME AFFAIRS
(Disaster and Conflict Management Division)

Singha Durbar
Kathmandu, Nepal.

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Acknowledgement

Nepal has experienced series of disasters during the past few years. The continuous onslaught of disasters has compelled Nepal to move away from a response-centric approach towards an emphasis on preparedness and prevention, thus bringing about a paradigm shift in its overall disaster risk reduction and management agenda. The Ministry of Home Affairs (MoHA) and its development partners have invested considerable time and energy in bringing about this paradigm shift. The government has brought on board key stakeholders to develop and implement holistic programmes for DRRM with special emphasis on preparedness and a culture of safety, disaster risk financing, transferring disaster risks, and coherence to build a resilient society and reduce the impacts of disasters at all levels.

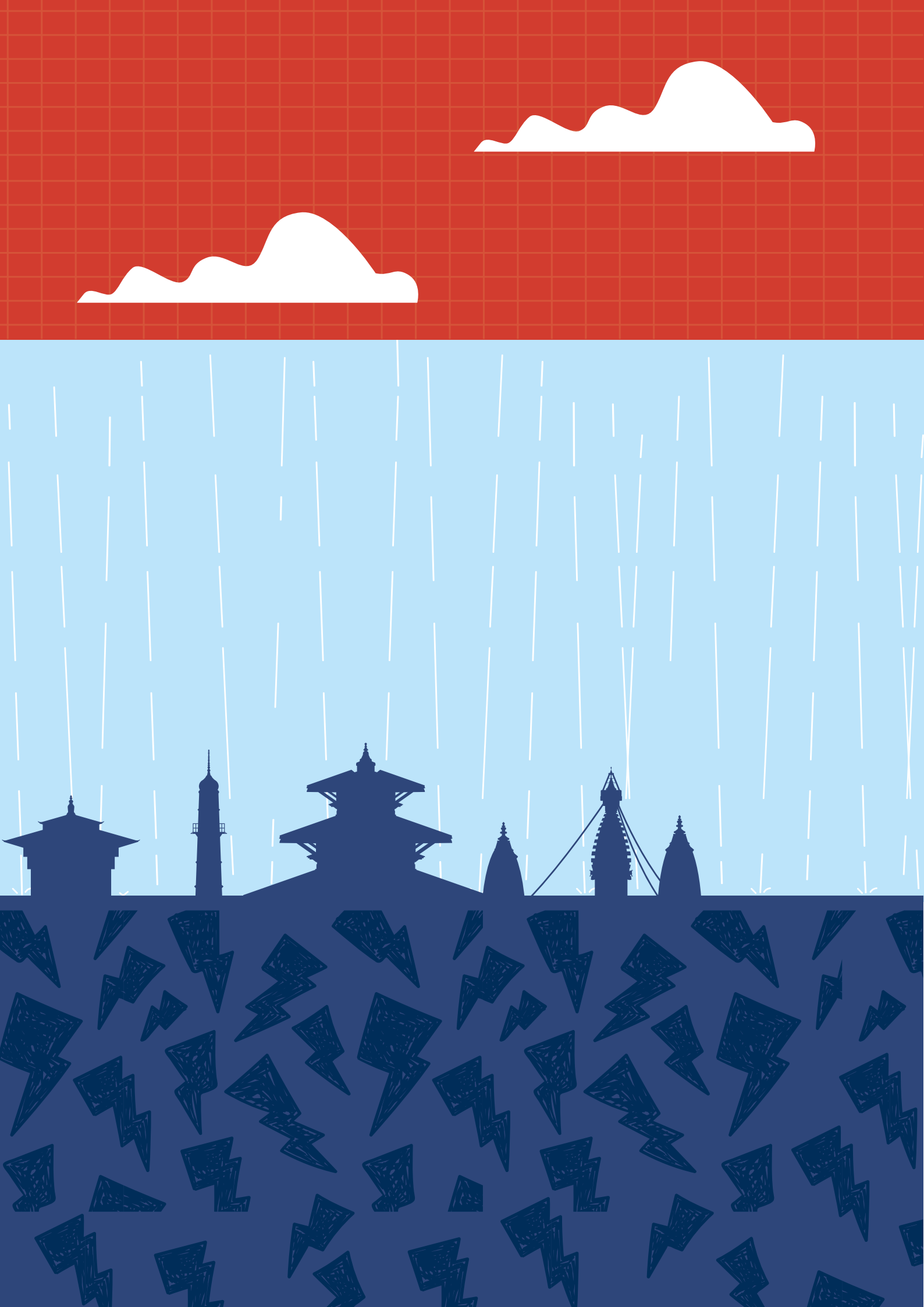
The preparation of the Nepal Disaster Report has now been delegated to the National Disaster Risk Reduction and Management Authority (NDRRMA) as enshrined in Nepal's Disaster Risk Reduction and Management Act—reflecting the true understanding of the DRRM governance and institution building. The establishment of the NDRRMA in Nepal's new federal structure is one of the biggest achievements in institutionalizing disaster risk reduction and management governance. Unlike previous years' reports, this report captures the real 'gem' of Nepal's effort in describing what a federal approach of DRRM looks like.

I take this as a privilege to extend my special gratitude to Mr. Gokarna Mani Duwadee, Secretary of MoHA, Mr. Anil Pokharel, Chief Executive Officer of NDRRMA, joint secretaries Mr. Basanta Adhikari and Arjun Kumar Bam, under secretaries Dr. Dijan Bhattarai, Ms. Goma Chemjong, Mr. Rajendra Sharma and the entire NDRRMA team for their valuable feedback. Ms. Smita Paudel, Section Officer, NDRRMA, deserves special mention for her incredible efforts in redrafting the report. The publication of this report would not have been possible without the persistent support of my preceding joint secretaries, Mr. Pradip Kumar Koirala, Mr. Mahadev Panth and Ms. Scheme Shrestha, under secretaries, Mr. Tulsi Prasad Dahal, Mrs. Bandana KC, Mrs. Rama Acharya, and section officers Mr. Jeetendra Adhikari, and Mrs. Ranjana Rai for their support, which substantially contributed to enrich the report.

On behalf of the Disaster and Conflict Management Division (DCMD), I would like to extend my appreciation to the Chief of Party of USAID's Tayar Nepal Project Mr. Tirtha Raj Joshi, Policy Advisor Mr. Deependra Nath Sharma, and Communications and Outreach Expert Mr. Santosh Pudasaini, in facilitating the report writing process. I acknowledge the contributions of Mr. Vijaya Singh and Mr. Sudhir Kumar of UNDP Nepal and the United Nations Office for Disaster Risk Reduction (UNDRR) who helped review governance aspects of this report in aligning it with the Sendai Framework. I also duly acknowledge the National Housing and Settlements Resilience Platform (NHSRP) team all other individuals and organizations who have directly and indirectly helped in contributing to various sections in shaping this report.

Finally, I would like to express my deep appreciation to the lead author, Dr. Deependra Joshi, who has demonstrated high professionalism and technical expertise to meticulously analyze data and take the lead in writing this report. I am confident that this report will be highly beneficial for policymakers, government agencies, non-government and humanitarian partners, the private sector, academia, students, and relevant stakeholders.

Dr. Bhishma Kumar Bhusal
Joint Secretary
Disaster and Conflict Management Division



Executive Summary

The Nepal Disaster Report (NDR) 2024 attempts to comprehensively map disaster events, activities, and programmes carried out by the government, non-governmental agencies, and other humanitarian partners between 17 July 2018 to 16 July 2024. This report presents a brief background on various disaster hazards along with their impact. It briefly highlights loss and damage, impacts and trends due to these disasters.

Analysis of these recorded disaster incidents shows an increasing trend in recent years. An alarming 32,375 small and large-scale disaster incidents were reported from 2018 until 2024. In reviewing the past six years' disaster trends, fire, landslide, thunderbolt, and earthquake have topped the list as the most common and are on the rise. These disaster incidents claimed the lives of 3672 people, while 446 went missing, and an additional 11,752 were injured. In all, 57,271 houses in the disaster affected areas were affected whereas 43,168 infrastructures were destroyed. Additional losses of 18,336 livestock were also recorded due to disasters.

The total value of economic losses incurred from disasters during the five-year reporting period accounted for NPR 23.60 billion. Recurrent disasters like fire, earthquakes, landslides, thunderbolt, flood, heavy rainfall, and windstorms were recorded. Landslides (2881) and fires (19,534) were leading disasters in terms of number of occurrences, similarly landslides (878), fire (619), thunderbolt (477), drowning (346), flood (260) and animal incidents (246) claimed more lives, comparatively.

A hazard comparison of demographic and economic loss shows that the highest number of deaths (losses) and injuries have occurred from landslides, fires, thunderbolts, and floods combined. The most economic loss is reported from fires, with earthquakes, flooding and landslides ranking second, third and fourth respectively.

Nepal's current disaster governance landscape is guided by the Constitution and the Disaster Risk Reduction and Management (DRRM) Act (2074). The Constitution stipulates that DRRM is the sole authority of local government and is also a shared authority among federal, provincial, and local governments. DRRM governance has been crafted to align with the changed governance structure. The country implemented the National Policy for DRR (2018), which is supported by the National Strategic Action Plan for DRR (2018—2030) in line with the Sendai Framework for DRR. Provincial and local governments have developed essential legal instruments and established institutional set up to enable them to implement DRRM.

The DRRM Act (2017) and Local Government Operation Act (2017) established institutional structures and provided them with mandates to deliver in the spirit of the Constitution at various levels. Federal government agencies, such as the Ministry of Federal Affairs and General Administration (MoFAGA) and National Planning Commission (NPC), have been supporting local governments by providing guidelines and sample policy documents to enhance local DRRM. Documents, such as local DRR Strategic Action Plan Guidelines (2021) and Guidelines for Local Level Planning (2021) guide plans and actions initiated by local governments.

This report examines how the government responded to the COVID-19 pandemic, how it responded to the crisis, socio-economic impact, impact on livelihoods caused by the pandemic, coordination, planning and monitoring,

gender dimension of the disaster, and key learnings. It presents the government's support in strengthening national, provincial, and local governance structures, which enable vulnerable communities to be better prepared, protected, and have sustainable recovery and increased resilience to crises, disaster management, and the ongoing impacts of the COVID-19 pandemic.

The NDR 2024 also sheds light on Nepal's progress made in earthquake reconstruction and recovery activities and pathways to reconstruction gains. It also reflects on how the country dealt with the forces of dual disasters (i.e., health and natural disasters) and showcases existing institutional arrangements and mechanisms for disaster preparedness, relief, and emergency response. It covers the existing legal and policy frameworks for DRRM and further elucidates the existing institutional capacities at the federal, provincial, and local levels for effective DRR and emergency management.

Finally, the report puts forth some challenges and the way forward based on lessons from disaster impacts and DRRM initiatives during this period among all three tiers of government and stakeholders. Nepal's priority actions on DRR are identified as the guidance towards localization of DRR policies and activities contributing towards building a more resilient country.

Acronyms and Abbreviations

APF	Armed Police Force
BBB	Build Back Better
CBS	Central Bureau of Statistics
CCA	Climate Change Adaptation
CCCM	Camp Coordination and Camp Management
CDO	Chief District Officer
DAO	District Administration Office
DCC	District Coordination Committee
DEOC	District Emergency Operation Centre
DDMC	District Disaster Management Committee
DHM	Department of Hydrology and Meteorology
DIMS	Disaster Information Management System
DPRP	Disaster Preparedness and Response Plan
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
EC	Executive Committee
EOC	Emergency Operation Center
DoHS	Department of Health Services
DoMG	Department of Mines and Geology
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEDSI	Gender Equality, Disability and Social Inclusion
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Floods
GPDRR	Global Platform for Disaster Risk Reduction
ICIMOD	International Centre for Integrated Mountain Development
IFRC	International Federation of Red Cross and Red Crescent Societies
LDRC	Local Disaster Relief Committee
LDPRP	Local Disaster Preparedness and Response Plan
LDMC	Local Disaster Management Committee
LEOC	Local Emergency Operation Centre
LISA	Local Government Institutional Capacity Self-Assessment
MoF	Ministry of Finance
MoALD	Ministry of Agriculture and Livestock Development
MoEWRI	Ministry of Energy,Water Resources and Irrigation

MoFE	Ministry of Forest and Environment
MoEST	Ministry of Education, Science and Technology
MoHA	Ministry of Home Affairs
MoFA	Ministry of Foreign Affairs
MoFAGA	Ministry of Federal Affairs and General Administration
MoHP	Ministry of Health and Population
MoPIT	Ministry of Physical Infrastructure and Transportation
MoUD	Ministry of Urban Development
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MoEST	Ministry of Education, Science and Technology
MoCIT	Ministry of Communication and Information Technology
MoLMCPA	Ministry of Land Management, Cooperatives and Poverty Alleviation
MoWS	Ministry of Water Supplies
MoWCSC	Ministry of Women, Children and Senior Citizen
NA	Nepali Army
NBC	National Building Code
NDRRMA	National Disaster Risk Reduction and Management Authority
NDMP	National Disaster Management Policy
NEOC	National Emergency Operation Center
NPC	National Planning Commission
NPR	Nepali Rupee
NRA	National Reconstruction Authority
NRCS	Nepal Red Cross Society
NSDRM	National Strategy for Disaster Risk Management
SAR	Search and Rescue
SDG	Sustainable Development Goal
SFDRR	Sendai Framework for Disaster Risk Reduction
WASH	Water, Sanitation and Hygiene
WB	World Bank

Contents

CHAPTER 1: INTRODUCTION

1.1 Background

Nepal is prone to natural disasters, including earthquakes, floods, landslides, droughts, lightning, heat waves, cold waves, avalanches, hailstorms, snowstorms, windstorms, and forest fires. Further, because of rising temperatures in the Himalaya, glacial lake outburst floods (GLOF) now also affect Himalayan settlements and downstream settlements. These hazards have become more intense and frequent due to erratic weather patterns, leading to significant loss of life and property in recent years and underscoring the need for a robust understanding of disaster risks and stronger disaster risk reduction and management (DRRM) measures, from policy formulation to implementation.

In recent years, Nepal's disaster risk has been further exacerbated by the adverse impacts of climate change. Scientific reports have not only documented the increasing trend of climate-induced disasters but have also highlighted the alarming potential for future catastrophes. Failure to act promptly may escalate risks beyond the coping capacity of countries such as Nepal. In this context, DRRM has become increasingly challenging, necessitating concerted efforts at local, regional, and global levels.

For several decades, disasters in Nepal were attributed to divine intervention and considered unavoidable occurrences. Consequently, disaster management largely focused on response and rescue efforts. However, since the enactment of the National Disaster Risk Reduction and Management Act in 2017, Nepal has notably shifted from a response-centric to risk reduction approach.

Nepal's new constitution, promulgated in 2015, decentralized state power across three tiers of government—federal, provincial, and local—and it delegated disaster risk governance to local governments as an exclusive right. Meanwhile, the federal and provincial governments continue to play a key role in disaster risk reduction (DRR) under the framework of concurrent rights. The enactment of the National Disaster Risk Reduction and Management Act has been instrumental in shaping the country's DRRM architecture in this federalist structure. Additionally, the localization of the Sendai Framework for Disaster Risk Reduction (SFDRR) through the Disaster Risk Reduction Strategic Plan of Action (2018—2030) has provided strategic guidance for DRRM governance across all three levels of government. The transition to federalism has thus provided a unique opportunity for the government and DRRM stakeholders to build on past progress and limit current and future threats by strengthening DRRM at all levels.

The establishment of the National Disaster Risk Reduction and Management Authority (NDRRMA) in December 2019 was a paradigm shift for Nepal. The functions of NDRRMA, as outlined in the Act, mark a clear transition from a response-centric approach to one focused on risk reduction. Mandated to engage the 'whole of society,' NDRRMA, as an apex institution for DRRM, is at the forefront of building disaster resilience in Nepal. From developing disaster information systems to conducting risk assessments and communicating risks, it has played a leading role in shaping policies aligned with global frameworks, including the SFDRR, to guide Nepal towards greater disaster resilience.

However, considering increasing climate risks, the approach to DRRM requires rethinking to adapt to climate change's adverse impacts. Equally important is the need for strengthening skills and capacity among staff at all three levels. For low and lower-middle income countries like Nepal, access to financing from global funds such as Loss and Damage Fund and Green Climate Fund (GCF) is crucial. Nepal has already experienced extreme events, such as the 2021 Melamchi Flood, which likely resulted in part from climate change impacts, particularly in the Himalayas. The heightened vulnerability of communities and settlements due to climate change-induced disasters demands serious attention.

While Nepal's policy and legal frameworks include provisions to address the needs of vulnerable populations, existing socio-cultural and economic inequities exacerbate the vulnerability of women, children, persons with disabilities, the elderly, and other at-risk groups. Poverty and marginalization further compound this vulnerability.

1.2 National DRRM context

Nepal's Constitution delegates decentralized power and resources to provinces and local governments for mainstreaming DRR and climate change across the three tiers of periodic planning, budgeting, and implementa¬tion. The Government of Nepal has developed various legal and institutional arrangements to plan and oversee DRRM activities. The country has enacted the DRRM Act, 2017 AD to address disaster risk management with a comprehensive approach focusing on different priorities like preparedness, mitigation, response, and rehabilitation. The DRRM Act has shifted the DRRM landscape from reactive to proactive DRRM, strengthening legal frameworks, policy and planning, organization, and institutional capacities and partnerships for DRRM.

The DRRM Act emphasizes risk reduction over response and designates the DRRM Council as the highest policy making body in the country. It also recognizes the NDRRMA as a distinct entity that delivers DRRM initiatives. The National Disaster Risk Reduction Policy (2018) and the Disaster Risk Reduction National Strategic Plan of Action (2018—2030), consistent with the SFDRR priori¬ties, have revealed larger opportunities to work with three tiers of governance, which is a new roadmap for Nepal and is a second DRRM paradigm shift that identifies targets, priority actions and activities.

1.3 Nepal in terms of resilience

Over the past six years, resilience building has been central to Nepal's DRRM initiatives. With the increasing intensity and frequency of hazards due to climate change and rising vulnerabilities, resilience building has been more challenging. Nepal has made some progress in enhancing disaster resilience through risk-informed development in both the public and private sectors, the establishment of early warning systems, risk transfer mechanisms such as insurance, and capacity building at the local government level.

Nepal has developed various policy instruments to enhance adaptive capacity across vulnerable sectors in response to climate change. The country has successfully demonstrated increased resilience to climate-induced disasters and reduced the vulnerability of communities and institutions by supporting strategies that improve preparedness, mitigation, and disaster response. In recent years, Nepal has adopted several policy documents on disaster and climate change, primarily aimed at building resilience to climate impacts and achieving net-zero emissions by 2045 through low-carbon development pathways.

Nepal's adoption of the Green, Resilient, and Inclusive Development (GRID) approach marks a significant shift in managing risk and development. This approach transitions from reactive responses to proactive strategies for long-term green growth, climate action, and sustainable, inclusive development. Addressing both current and future risks requires a comprehensive resilience and preparedness program that integrates anticipatory action, preparedness, and response into development programming, supported by a robust repository of disaster knowledge and trained human resources.

The SFDRR mid-term review reveals increasing efforts to build better coherence across national and international policy frameworks. This has resulted in greater alignment of policy objectives and improved coordination in the implementation of common goals and targets. Nepal's commitment to building a safer, more adaptive, and disaster-resilient nation is a shared priority that spans across national policy and regulatory instruments. The inclusion of specific targets for 2030, such as those under Sustainable Development Goals 2 and 11, underscores the need for continued action to reduce disaster risks—both natural and human-induced—to sustain national prosperity.

Recent events such as the 2021 Melamchi disaster, the 2021 out-of-season floods, and the 2022 Saptakoshi river floods have provided critical lessons. One key takeaway is that Nepal's resilience-building efforts must account for uncertain and changing conditions, which require dynamic adaptation planning with the flexible decision-making. A central challenge is integrating climate-resilient development pathways into sector planning and implementation. In this context, Nepal has prioritized "mountain" and "loss and damage" agenda, advocating for these issues in national and international forums to strengthen its fight against climate change.

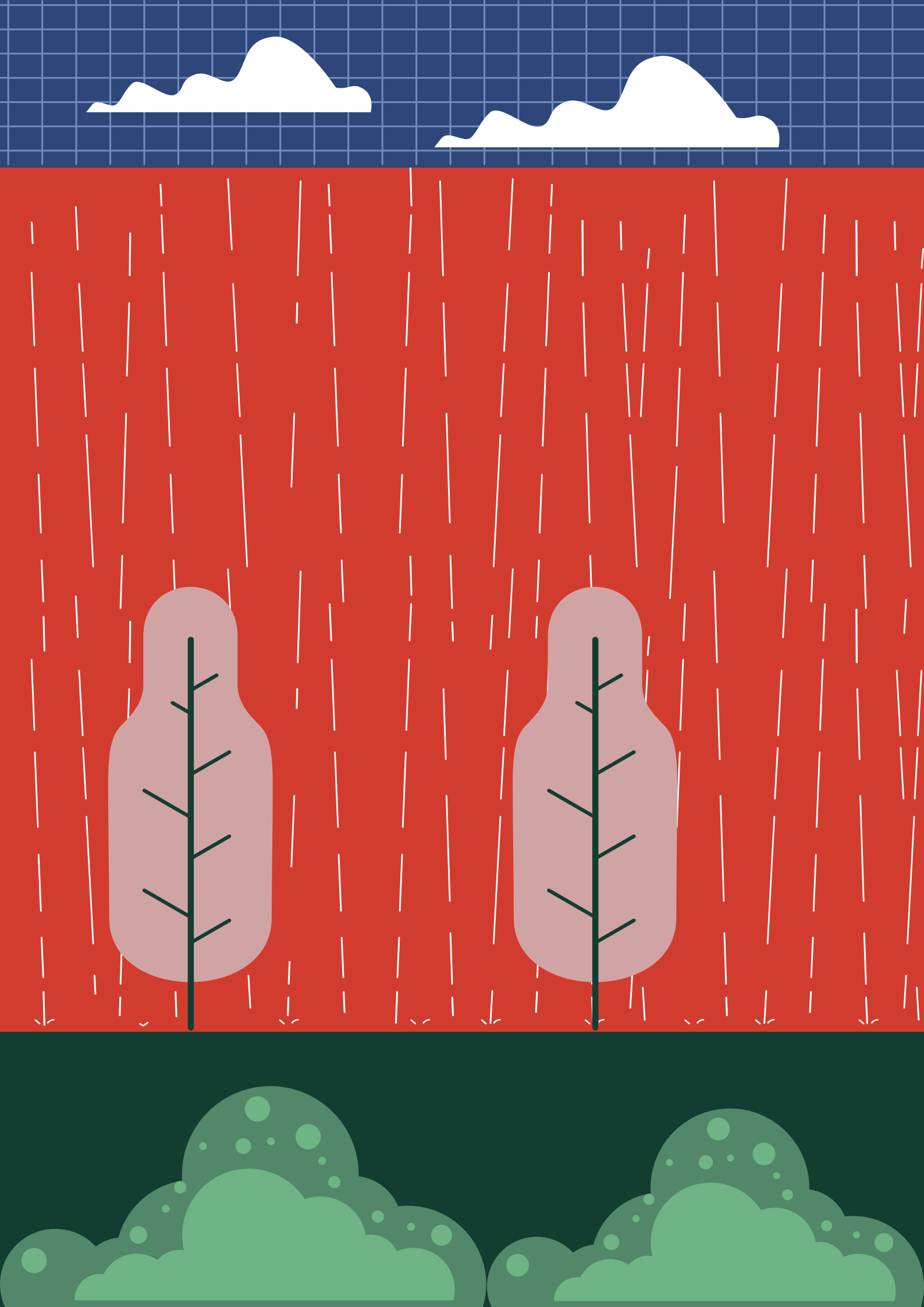
Massive landslide in Lapilang village of Kalinchowk rural municipality of Dolakha district. (© Deependra Joshi)

1.4 Objective

In the backdrop of Nepal's post-federalism trajectory in Disaster Risk Reduction and Management (DRRM), the Nepal Disaster Report 2024 reflects on significant developments over the last six years. Since the publication of the previous Nepal Disaster Reports, notable reforms include the enactment of the new DRRM Act, the establishment of NDRRMA, and strengthening of disaster risk governance at the municipal level. Moreover, it is essential to examine disaster trends during this period to assess the nature and frequency of disasters, evaluate the effectiveness of governance initiatives in risk reduction and response, and identify gaps in both policies and implementation. Significant strides have been made in risk assessment, risk communication—including the institutionalization of the Bipad portal, early warning systems, and inter-agency coordination, all of which have contributed to building resilience.

The objective of the Nepal Disaster Report 2024 is to highlight Nepal's experiences in DRRM over the past six years (from 17 July 2018 to 16 July 2024)[1] . The report documents progress, key lessons learned, and challenges encountered in managing disaster risk and compiles and identifies future priority actions for effective risk reduction, disaster response, and recovery. Data for the report was collected and analyzed using both qualitative and quantitative methods. Key documents—both published and unpublished—on DRRM and Climate Change Adaptation (CCA) were obtained from relevant ministries, departments, development partner organizations, and academic institutions involved in DRRM.

1 Unlike the Gregorian calendar, Nepal's fiscal year starts from Srawan to Asadh months of Nepali calendar. This report documents progress from 1 Srawan 2075 to 31 Asadh 2081 (i.e. 17 July 2018 to 16 July 2024).



CHAPTER 2
DISASTER AND CLIMATE CHANGE—RISKS, IMPACTS AND TRENDS

2.1 A mixed picture

Nepal is located in one of the world's most fragile eco-regions and is prone to natural and human-induced disasters. Several international agencies have provided cross-country comparisons of Nepal's natural hazards and environmental risks. These rankings have put Nepal at the high end of risk exposure suggesting high vulnerability to climate change risks.

The Government of Nepal has been working hard to reduce risks by mainstreaming DRRM into sectoral development to prevent disaster occurrence, mitigate disasters' impact, and ensure adequate preparedness for effective disaster response. The Bipad portal is a gateway to DRR information and interventions that record past disasters in Nepal, indicating that disaster events have increased in recent decades and that landslides, debris flows, thunderstorms, and floods are the most frequently occurring major disasters. Over the years, disasters have also caused huge economic damage, and its impact is likely to intensify because of climate variability and increase in extreme weather events can affect the frequency and intensity of disasters and make the country more vulnerable.

2.2 Disaster impacts (2018—2024)

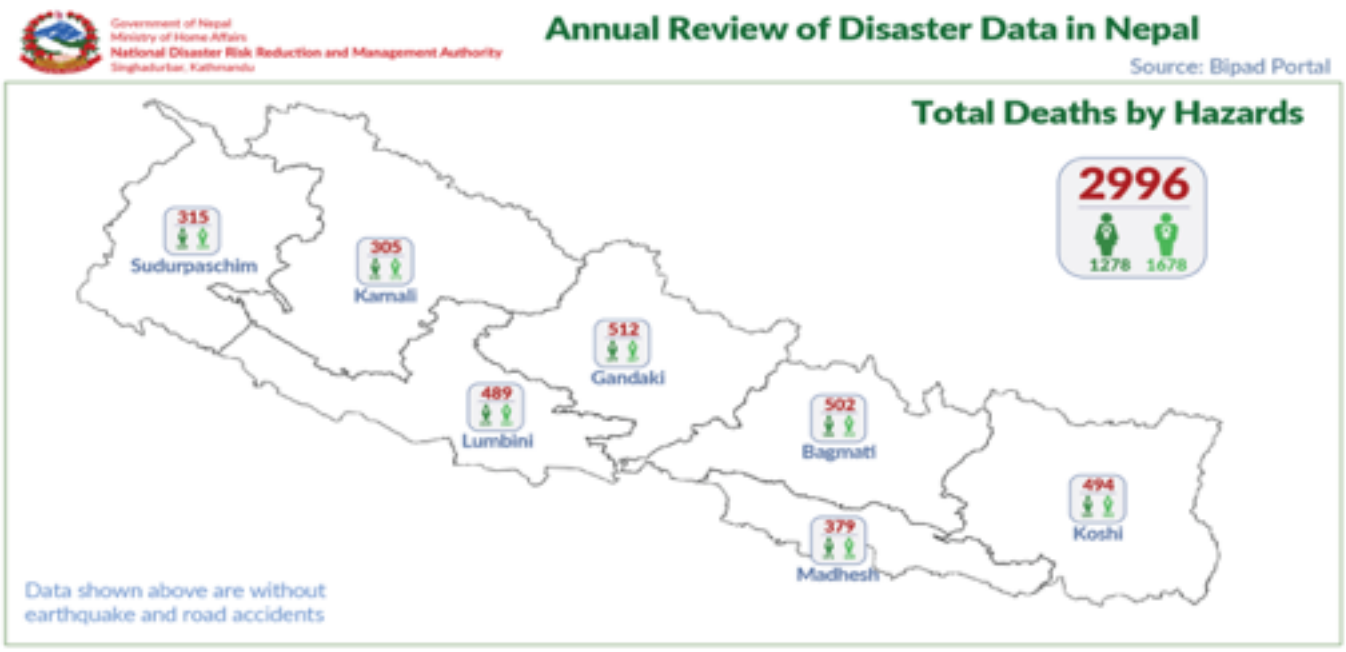
Nepal is facing increased disaster risks from various hazards such as fire, landslides, lightning strikes, heavy rainfall, animal incidents, windstorms, and more. These incidents have caused unprecedented loss of lives and properties. Monsoon and pre-monsoon related disasters like fire, lightning strikes, floods, landslides, heavy rainfall and associated debris flow have claimed most of these lives. Disaster consequences are having greater adverse effects on populations, structures, livelihoods, and the environment. Vulnerability of human settlements to natural disasters is rising because of increasing deforestation, encroachment of flood plains, environment degradation, unplanned development and heavy influx of population to urban areas in search of employment and livelihood opportunities. However, information management on the occurrence and severity of disasters has greatly improved in recent years, with an upswing in data reported in the Bipad portal in the past six years through increased coordination and cooperation on DRRM and efforts to accelerate implementation of the SFDRR.

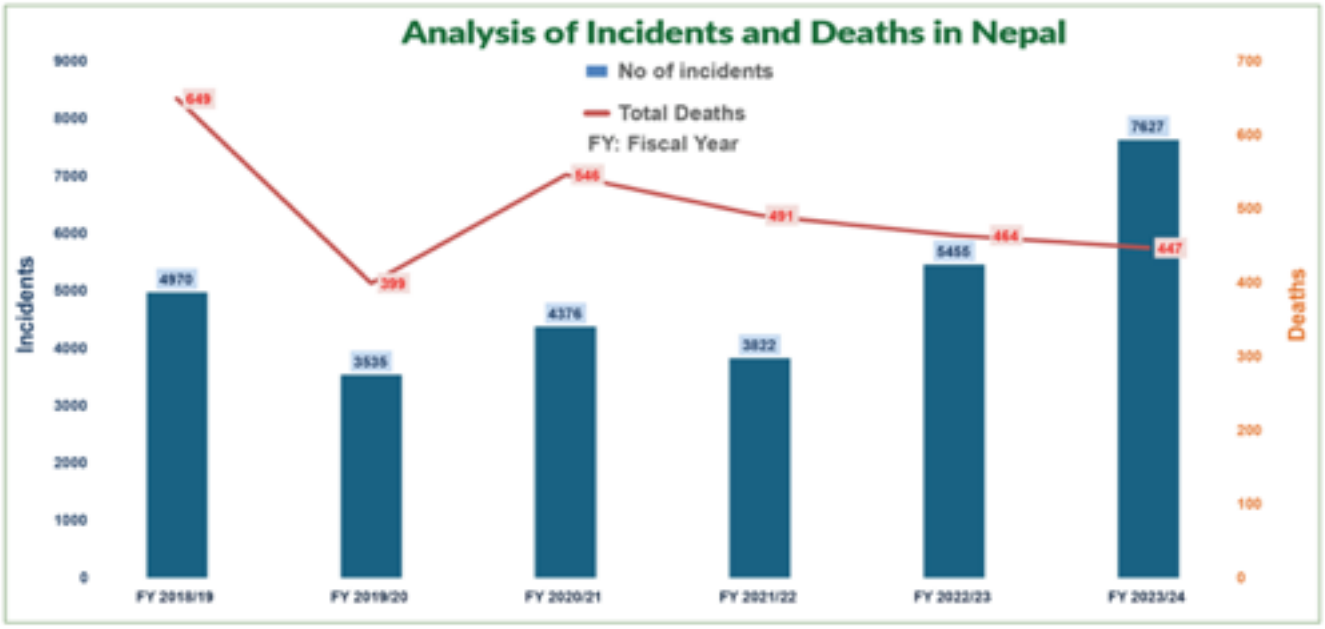
Analysis of these recorded disaster incidents showed an increasing trend in recent years. A whopping 32,375 disaster incidents took place in six years (2018—2024). In reviewing the past six years' disaster trends, fire, landslides, lightning strikes, heavy rainfall, and floods were most frequent, with a trend suggesting increasing frequency and severity in the future. Nepal's disaster database records 18 weather-related disasters, including floods, landslides, earthquakes, lightning strikes, epidemics, fires, windstorms, avalanches, hailstorms, heavy rainfall, animal incidents, boat capsizing, air crashes, snowstorms, and high altitude sickness. The data, drawn from NDRRMA's Bipad portal dashboard, provides an overview of various metrics related to incidents, damages, and losses caused by various hazards from real-time sources such as incidents reported, hazard alerts, and trends over time.

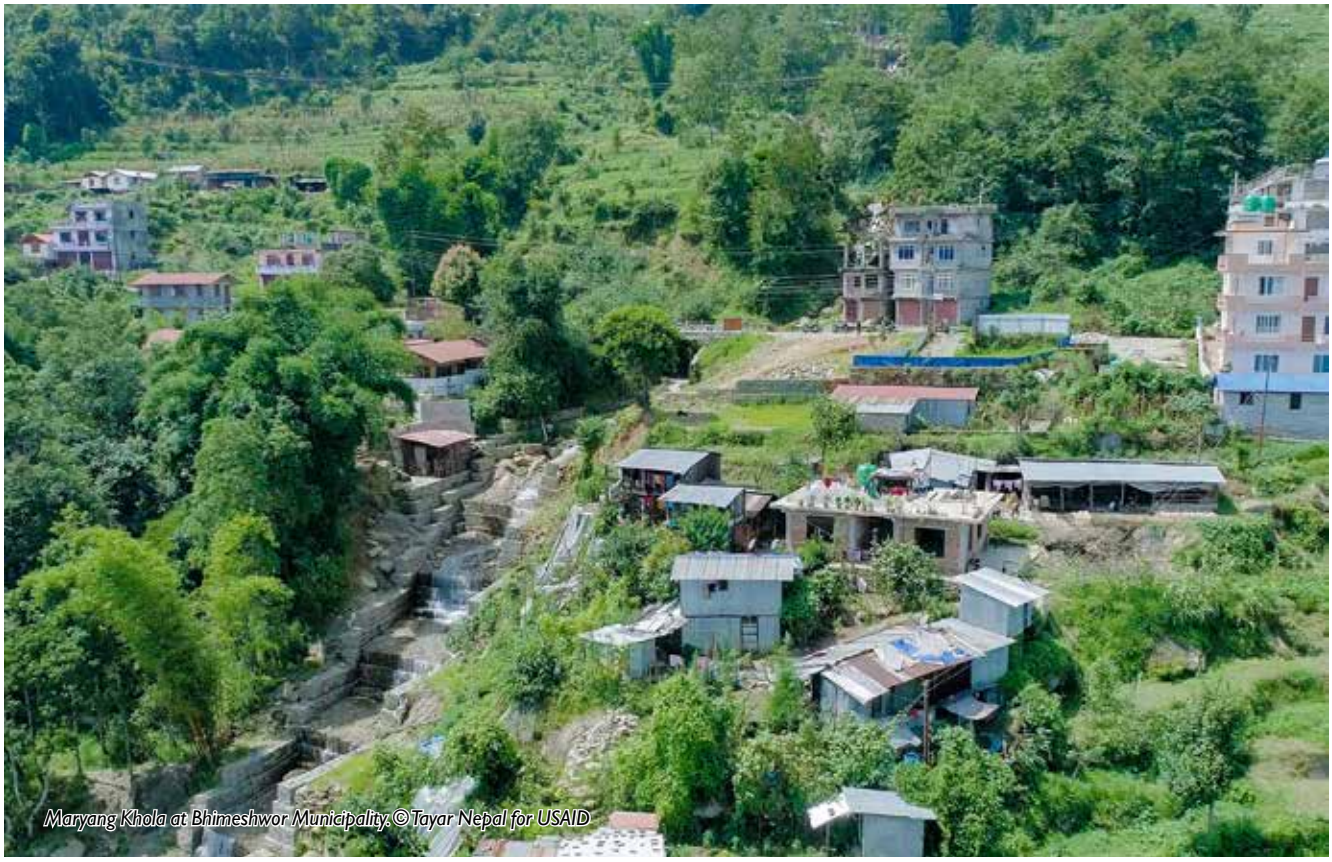
In terms of occurrences, climate-related disasters dominate the trends over the past five years, accounting for 91.2 percent (excluding animal incidents, boat capsizing, drowning, and "others") of all 32,375 recorded incidents between mid-2018 until mid-2024. A total of 2,996 people were killed by various disasters in Nepal (excluding earthquake and road accidents), with Gandaki Province recording the highest toll of 512 casualties followed by Bagmati Province (502) and Koshi Province (494). Within this total, fire was the most frequent type of disaster, at 60.34 percent of all recorded events. Floods, landslides, heavy rainfall, lightning strikes, and fires are the major climate-induced disasters in Nepal. A hazard comparison of demographic and economic loss shows that the greatest number of deaths and injuries have occurred from landslides, fires, lightning strikes, and floods combined. The most economic

losses were reported from fires, with earthquakes, floods, and landslides ranking second, third, and fourth, respectively. The infographics shown below (Figures 1, 2, 3, and 4) present total incidents and deaths and provincial data of incidents and deaths by hazards with an analysis of accidents and deaths in Nepal from mid-2018 until mid-2024.

Figure 1: Loss of human lives caused by disasters (17 July, 2018—16 July, 2024)







Maryang Khola at Bhimeshwor Municipality. © Tayar Nepal for USAID

2.3 Summary of disaster incidents (2018—2024)

A total of 32,375 small and large-scale disaster incidents were reported from 2018 until 2024. These disaster incidents claimed the lives of 2996 people (1278 male and 1678 female), while 446 went missing, and an additional 11,752 were injured. In all, 57,271 houses in the disaster affected areas were impacted, and 43,168 infrastructures were destroyed. Losses of 18,336 livestock were recorded due to disasters. The total value of economic losses incurred from disasters during the five-year reporting period accounted for NPR 23.60 billion. Recurrent disasters like fire, earthquakes, landslides, lightning strikes, flood, heavy rainfall, and windstorms were recorded. Landslides (2743) and fires (19,593) were the leading disasters in terms of number of occurrences. Similarly, increasing casualty rates were recorded for disasters such as lightning strikes (408), floods (245), animal incidents (242), and snakebites (126) during the six-year timeframe.

2.3.1 Fire

The number of recorded fires (excluding wildfires) saw a considerable rise, totaling 19,593 during the six-year period. The total number of deaths from fire was 593 people during the review period; comprising 348 females, 244 males, and 1 unknown, which indicates how vulnerable women are in the event of fire.

2.3.2 Landslides

During the six-year review period, a total of 2,743 landslide incidents occurred in Nepal, killing 859 people and causing an estimated loss of NPR 796.9 million. Provincially, deaths from landslides were highest in Gandaki Province (201), followed by Bagmati Province (194), and Karnali (143). No landslide-induced deaths were recorded from Madhesh Province.

2.3.3 Lightning strikes

Among the different disaster types, lightning strikes claimed 408 human lives through 1,699 recorded incidents. An analysis of the distribution of human deaths in different provinces shows that among various disaster types, lightning strikes caused more casualties in Koshi (92), Lumbini (88), and Madhesh (68) provinces from 2018 to 2024.

Figure 2: Provincial incidents and deaths caused by flood, landslide, and thunderstorm (17 July, 2018—16 July, 2024)

Figure 3: Provincial incidents and deaths caused by fire, forest fire and animal incidents (17 July, 2018—16 July, 2024)

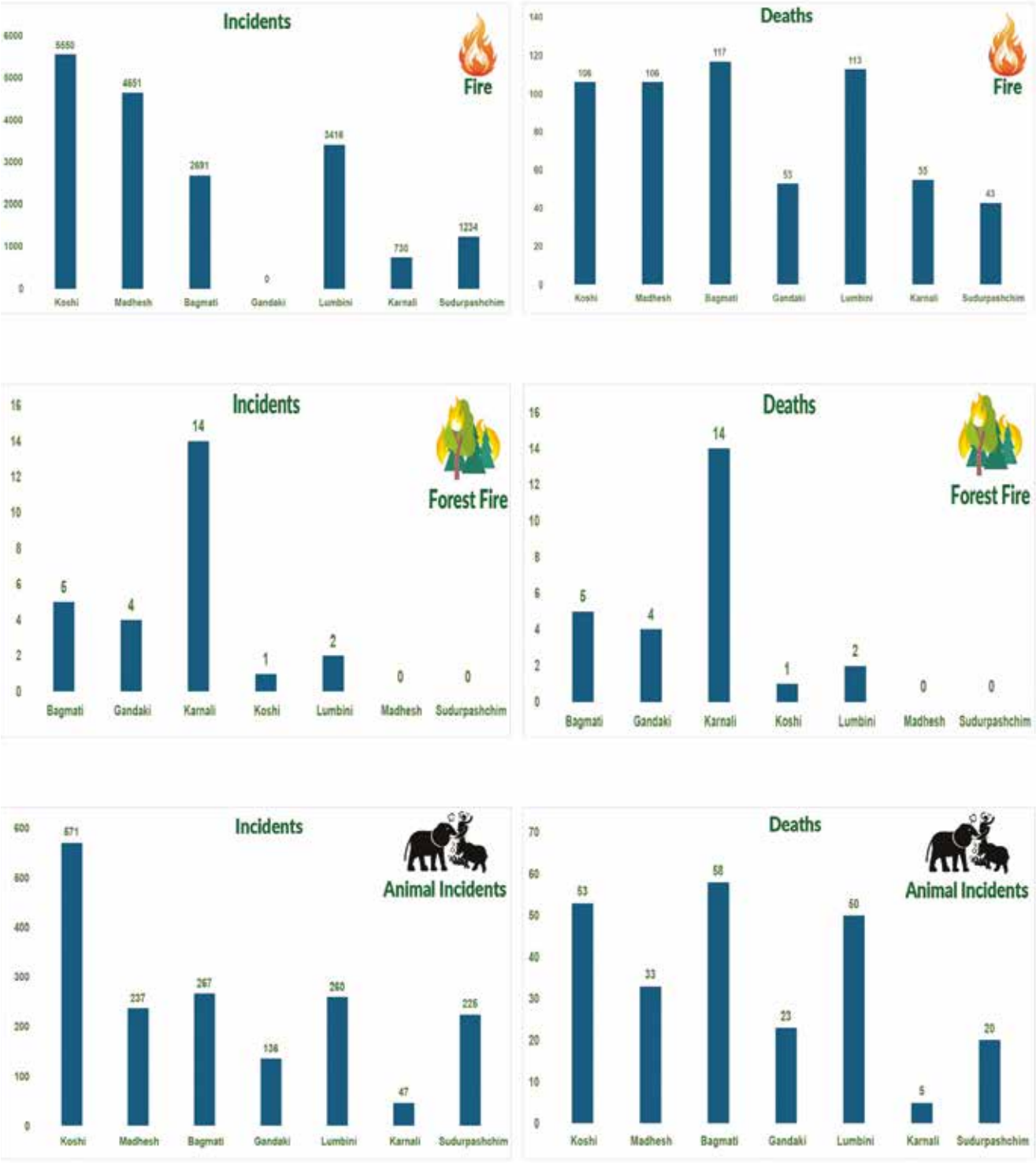
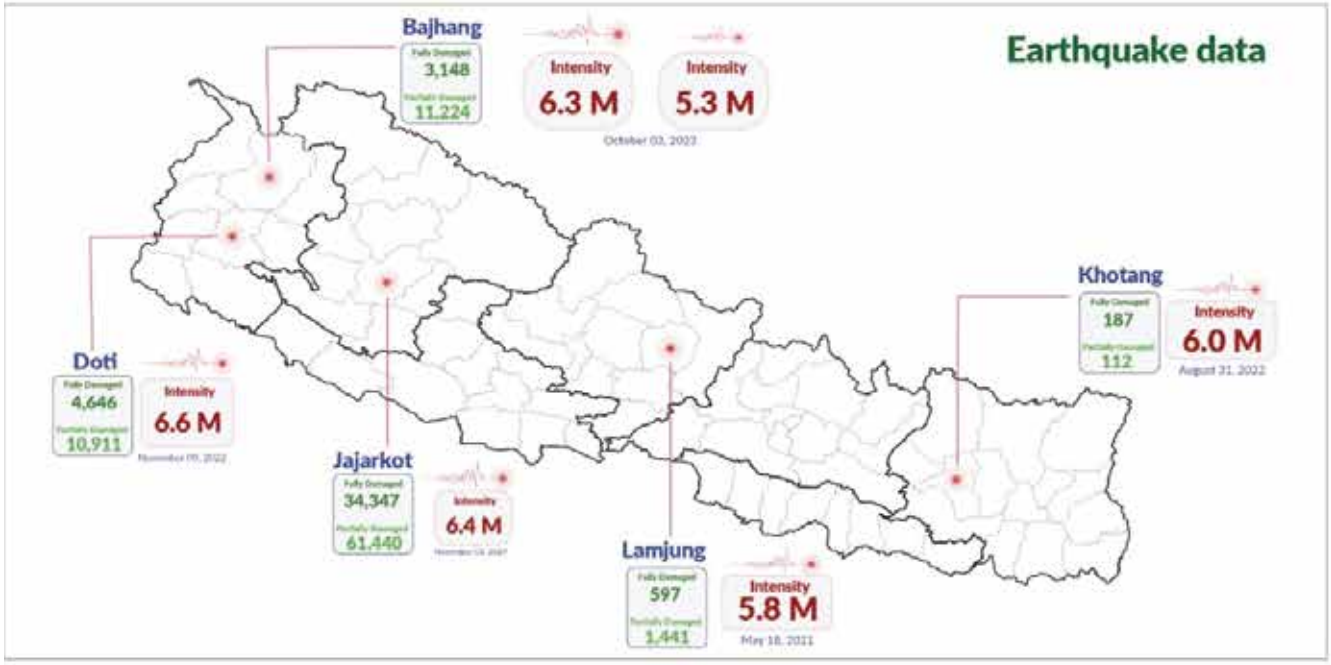
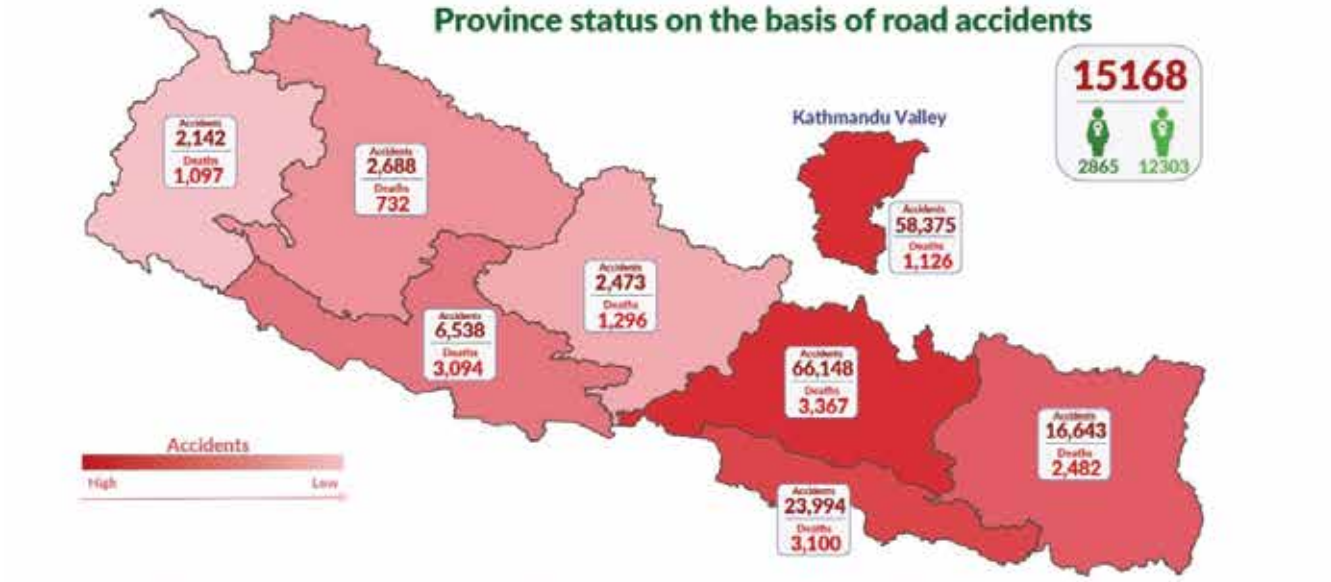
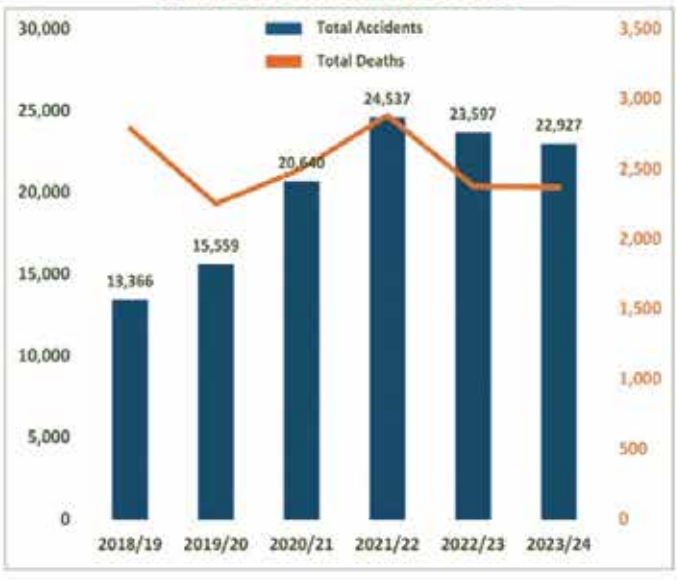


Figure 4: Provincial data of earthquake and road accidents and deaths (17 July, 2018—16 July, 2024)







2.3.4 Floods

Floods are triggered by several different causes, including rapid snow and ice melting in the mountains, extreme torrential rainfall in the foothills during monsoon season (June–September), and GLOF. During the years in review, Nepal witnessed out-of-season heavy rains shortly after monsoon season, resulting in a string of floods and landslides across the country. As they occurred during harvest time, crops were washed away, resulting in massive loss of food supplies in the affected areas in addition to causing damage to major roads and bridges. Nepal has witnessed 927 flood incidents claiming 260 lives during the six-year period. Over the last six years from mid-2018 to mid-2024, floods caused 45, 42, and 41 deaths in Gandaki, Koshi, and Madhesh provinces respectively, accounting for 49.23% of all deaths caused by floods.

2.3.5 Earthquakes

In November 2023, the Jajarkot earthquake in Kanali Province was responsible for affecting the most people (killing 156 people, affecting 67,780 families, and destroying 65,427 houses in the year 2023 alone). This is the most damaging hazard of 2023 in terms of costs (NPR 2.47 billion). As part of reconstruction efforts, the government approved and issued building guidelines for transitional shelters and provided financial and humanitarian support to the affected families. Similarly, in the six-year period, there were 163 incidents of earthquakes, killing 162 people (96 females and 66 males) and causing estimated economic losses of NPR 2.48 billion.

2.3.6 Windstorms

The severity of disasters varies in terms of fatalities, injuries, and property damage. During the six-year period under review, windstorms claimed 87 lives with 40 deaths alone in 2019. In this period, there were 1,013 recorded incidents of windstorms causing estimated economic loss of NPR 433.5 million.

2.3.7 Animal incidents

Nepal reported 1,743 animal incidents with 242 deaths from across the country. While Koshi and Bagmati provinces recorded 571 and 267 animal incidents, respectively, Bagmati and Lumbini provinces witnessed 58 and 50 animal deaths, respectively. These animal attacks were mostly in the form of wildlife attacks, wildlife traffic accidents, animal assaults, and monsoon-induced disasters.

2.3.8 Road accidents

The six-year reporting period witnessed alarming rates of road accidents, with 120,626 reported cases and 15,169 deaths (12,303 male and 2,865 female) from all over the country. The total recorded cases of road accidents in Kathmandu alone amounted to a whopping 58,375 accidents with 1,126 casualties during the reporting period. Among the various types of vehicles associated with road accidents are two wheelers (95,978) and jeep/car (45,448) accidents. The increasing number of urban road accidents indicates that human factors are one of the major causes of road accidents, which calls for generating awareness on traffic rules and safety education.

2.4 Cascading risk trends

Among the major disasters in the six year period are Nepal's first tornado in Bara and Parsa district (2019), the Melamchi disaster (June 2021), off-season floods (October 2021), the Mustang avalanche (November 2021), rise in forest fires (2021), the Jugal landslide (August 2020), the Saptakoshi river flood (August 2022), post-monsoon disaster (October 2022), landslide and debris flow in Sindhupalchowk (2020), the Jajarkot earthquake (November 2023), and the unprecedented rainfall (July 8, 2024) in Kanchanpur district of Sudurpaschim district (Box 14). These disasters have taken a significant toll, both in terms of lives lost and property damage. For the first time, this edition of the NDR has estimated the economic costs stemming from the combined impacts of the disaster-health nexus. While responding to the COVID-19 pandemic, Nepal also had to contend with its regular sequence of other natural hazards, including floods, landslides, lightning strikes, and GLOFs, most of which have been hydrometeorological. In responding to disasters, some of the established measures for prevention, response, and recovery were interrupted by lockdowns, travel restrictions, and other containment measures imposed in response to COVID-19.

2.5 Financial impact of disaster

The frequency of disaster incidences is rapidly increasing in Nepal. Among all natural hazards, those that cause the greatest devastation in terms of human and economic impact in Nepal are landslides, fires, lightning strikes, and floods. Every year, disasters due to fires, floods, landslides, earthquakes, lightning strikes and heavy rainfall trigger immense loss, including fatalities and property damage, which calls for urgent DRR action. Fatalities from climate-related disasters also reflect vulnerabilities rather than being a crude function of the rising number of occurrences. Unlike earthquakes, populations vulnerable to extreme weather events, such as those of the 2019 Bara and Parsa's first-ever tornado in Nepal, have experienced major economic losses and damage. These economic losses include house damage, livestock and crop loss, and damage to public property. Fires topped the list in terms of economic losses incurred, reaching a total of NPR 17.63 billion during the review period (mid-2018–mid-2024). In terms of percentage, fire alone accounted for 74.68% of the total national economic loss of NPR 23.60 billion.

From the policy perspective, the onus is to reduce the potential impacts of natural disasters, which calls for a better understanding of the drivers of disaster impacts. Realizing the necessity to document economic loss data, The National Emergency Operation Centre (NEOC) has been coordinating with provincial and local Emergency Operation Centers (EOCs) to maintain records of losses from disasters. However, there is a tendency to overestimate economic losses. Thus, loss and damage are not only a future issue for Nepal, but something that vulnerable communities are experiencing right now. Overall, disaster affected households experienced damage to assets in which their life savings were invested (houses) or on which their livelihoods depended (work tools). This underpins how extreme events such as COVID-19 and other natural disasters threaten the critical asset base of poor families. Inadequate protective nets offered by social security or insurance to help poor families rebuild their lives further pushes them into a debt trap and impoverishment.

The summary of economic loss by major disasters and its financial impacts on the infrastructures and houses damaged by various disasters for the last six-year review period is illustrated below.

Figure 11: Economic loss by major disasters (17 July, 2018—16 July, 2024)

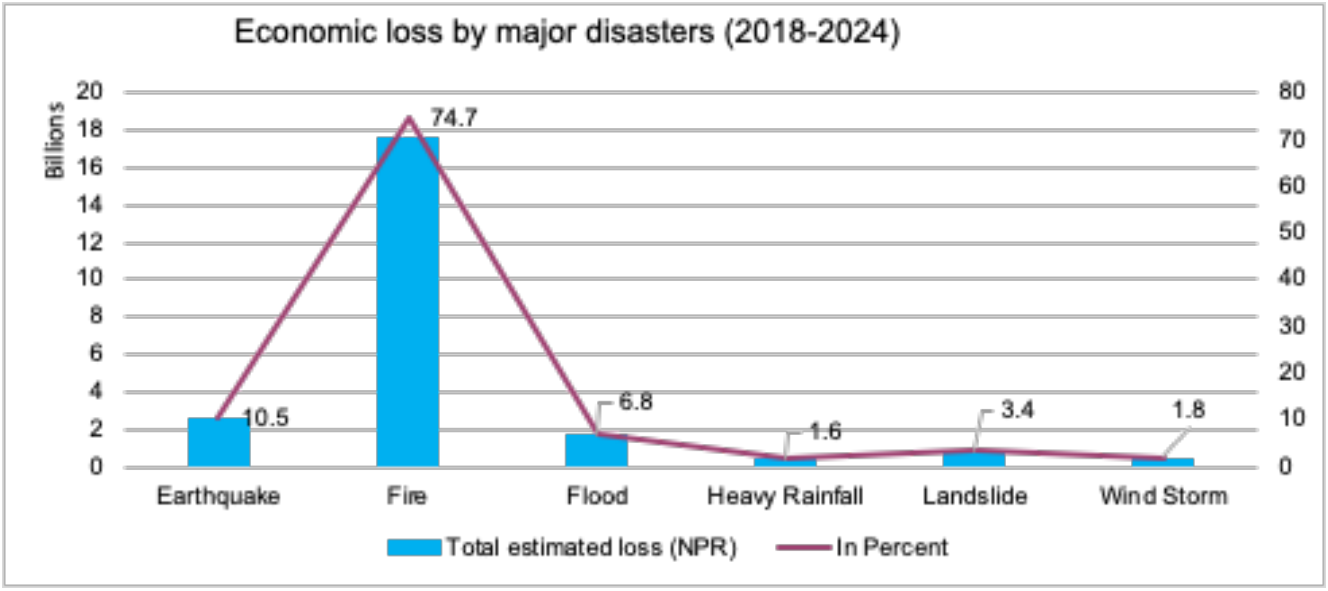


Figure 12: Infrastructure and houses destroyed by disasters by province (17 July, 2018—16 July, 2024)

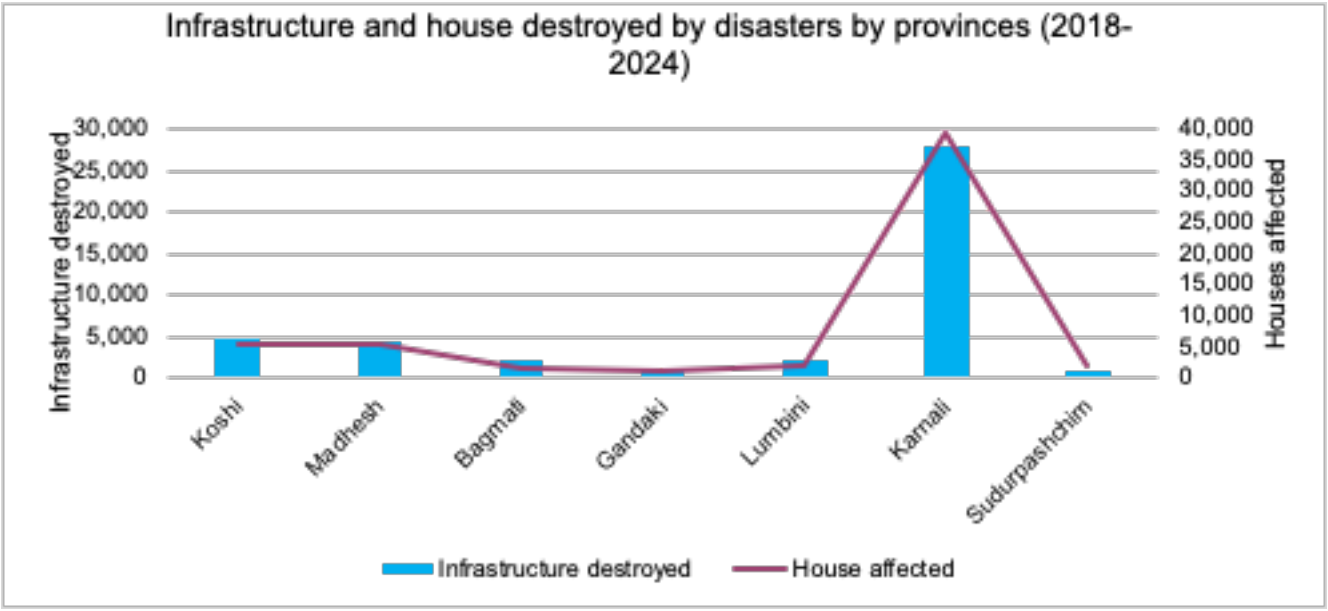
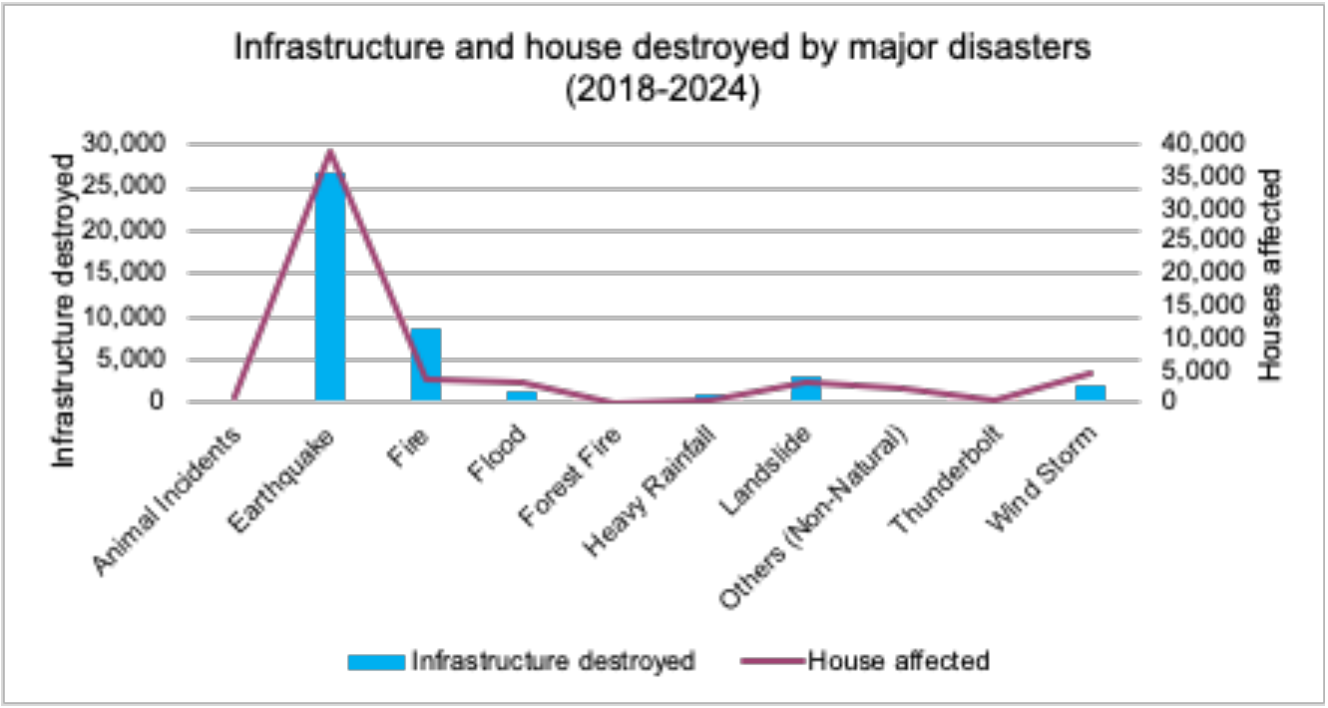


Figure 13: Infrastructure and houses destroyed by major disasters (17 July, 2018—16 July, 2024)



Health workers during the COVID-19 pandemic. © Tayar Nepal for USAID

2.6. Responding to Covid-19 and other pandemics: Risk, impact and management

After the declaration of COVID-19 as a pandemic, the government response was led by a high-level committee headed by the Deputy Prime Minister and the Minister for Defense. The government also established a COVID Crisis Management Centre (CCMC)–led by the Secretary, Office of the Prime Minister and Council of Ministers (OPMCM) with senior MoHP officials as members, along with a steering committee led by the MoHP Secretary. The main objective of the CCMC was to carry out responses in an integrated manner through a unified group of representatives from the central, provincial, and local levels of government, as well as the security department and other stakeholders. The government ensured that citizens and medical staff had access to free testing and treatment. The government also expanded healthcare insurance by discounting premium rates and increasing expenditures to improve health facilities in rural areas across the country to better deal with the crisis. Later, in May 2020, three different committees were formed for a quick and coordinated response for COVID-19 prevention, control, and treatment activities.

Immediately after the outbreak of the pandemic, the government formulated various policies, guidelines, approaches, documents, and directives, and facilitated their implementation at the sub-national level to mainstream COVID-19 preparedness and response. It also built the capacity of various communities at the sub-national level through the Incident Command System, district DRM committees, rapid response team, and case investigation and contact tracing team. In addition, the federal government provided provincial and local governments with supply chain management of diagnostic test kits, such as Real-Time Polymerase Chain Reaction (RTPCR) and Rapid Diagnostic Test (RDT) as well as personal protective equipment (PPE). Aligned with the federal guidelines and directives, respective provincial ministries of social development and provincial health directorates executed preparedness and response measures. Local governments implemented preparedness and response activities based on federal and provincial government mandates.

As the cases increased dramatically, particularly through the porous southern border with India, the government stepped up round-the-clock vigilance and scaled up testing despite limited diagnostic laboratories from just one government-owned National Public Health Laboratory to operationalize a network of 83 COVID-19 laboratories in both public and private sectors.

GOOD PRACTICE 1

Exemplary evacuation

Nepal reported its first COVID-19 case on January 23, 2020. Five days later, China declared a lockdown in Wuhan province. At the initiative of the Nepali Army, the Government repatriated 175 Nepalis from China on February 15, 2020. They were kept in quarantine in Kharipati, Bhaktapur, and provided comprehensive medical, nutritional, and psychosocial care.

The people residing in Kharipati were misinformed and thought that the Army had evacuated people who had already contracted the virus. The Army provided the correct information and strengthened risk communication, community engagement, and critical protection case management, in coordination with the Bhaktapur District Administration Office, Nepal Red Cross Society, and other local organizations.

A team of 50 security personnel from the Nepal Army, Armed Police Force, Nepal Police, and officials from the Ministry of Health were mobilized in the quarantine site with adequate training about safety measures. Upon reaching Kharipati, the evacuated people were administered swab samples and distributed booklets on prevention measures against COVID-19. The control room kept evacuees' temperature records twice per day, with army officials making rounds to verify that the screening was being done properly. Everyone was given strict guidelines to call and report any kind of temperature fluctuation immediately.

The result was apparent. After 16 days, the quarantine team and the evacuated Nepalis exited Kharipati. On that day, the residents who had previously left the area fearing the virus infection were skeptical of the quarantined group thanked the Nepali Army officials with garlands around their necks.

MoHP stepped up vaccination campaigns in all seven provinces for the first and second doses of COVISHIELD/AstraZeneca, Sinopharm, second dose of Pfizer BioNTech vaccine (from 24 hospitals), and first dose of Moderna (57 districts) to specific target groups, as specified by MoHP and as per the National Deployment and Vaccination Plan. Consequently, Nepal reached the landmark of administering more than 20 million COVID-19 vaccine doses by December 10, 2021. Among the total target population (19,922,164) aged 18 years and above, 68 percent received the first dose (excluding the J&J vaccine) while 51 percent received the second dose as of December 26, 2022. Around 77 percent of the target population received at least the first dose, including the J&J vaccine. MoHP continued to receive medical equipment, supplies, and health commodities from many countries and donor agencies.

The World Health Organization (WHO) relentlessly provided technical support to the National Public Health Laboratory (NPHL) through the regular monitoring of 17 designated COVID-19 laboratories in the country. WHO provided technical planning and operations support along with risk communications and community engagement initiatives. In addition, many national and international organizations contributed to the pandemic response—from development and humanitarian organizations to corporate and multi-bilateral agencies, media, and civil society organizations. Social organizations affiliated with the Social Welfare Council also responded to the pandemic by collectively working on key sectors, such as education, protection, shelter/WASH, food security, health, risk communication, and community engagement as well as the procurement of PPE, and health, safety, and hygiene kits.

2.7 Socio-economic impact of disasters

Nepal has experienced frequent catastrophic disasters—be it the 2015 Gorkha earthquake or the COVID-19 pandemic. These recurrent disasters have further increased the country's reliance on tourism and agriculture by obstructing critical infrastructure, such as transport and electricity production, thus delaying the development of other industries. Earthquakes alone are not the only source of damage, as the country also suffers from other hazards of varying scales. Most monsoonal precipitation between June and September triggers regular flooding in Nepal's low-lying Terai region.

It is difficult to measure the range and cost of social impact from disasters, as anecdotal evidence shows that different people experience social impacts differently and their ability to recover depends on a range of

other factors. Evidence shows that social capital—the networks and resources available to people through their connections to others—is critical in building community resilience following disasters. A case in point is the aftermath of fire incidents, as their overall economic impacts are felt most by the most vulnerable and marginalized communities living adjacent to forest areas with limited resources and livelihood options.

2.8 Impact of climate change

As climate change has exacerbated the incidence and intensity of extreme weather events such as floods, landslides, fires and windstorms, climate-induced disasters have also increased, resulting in human, socio-economic loss and infrastructure destruction, especially to the most vulnerable communities in Nepal. Rapid urbanization is making people more vulnerable to the impacts of climate change, in part due to out-migration from mountainous areas to the Terai. Ecosystem degradation in forests, wetlands, and melting of glaciers due to temperature rises is also a specific driver of vulnerability to disasters. It has severely compromised the well-being, income, and food security of community forest user groups who depend directly on these ecosystems for livelihoods.

With increased exposure, climate change has impacted communities, including women, indigenous peoples, local communities, and marginalized groups, as they rely heavily on natural resources for their livelihoods, which not only reduces access to resources but increases vulnerability to poverty. Inadequate intersectoral coordination and collaboration among stakeholders, limited knowledge and capacity, and inadequate finance are the major factors hindering abating climate change and disaster risk reduction in Nepal. This calls for integrating climate risk data into the broader risk management system.

Nepal's existing policy and regulatory frameworks recognize the importance of averting, minimizing and addressing loss and damage due to climate change, including extreme weather and slow-onset hazards and changes. Comprehensive risk assessment, risk insurance facilities and climate risk pooling are important tools that link climate action under the Paris Agreement with risk reduction under the SFDRR. In the face of accelerating climate change impacts, doing more of the same will not be enough.

However, ecosystem management can prevent and reduce the impact of disasters on vulnerable communities through ecosystem-based adaptation and nature-based solutions, which contribute to livelihoods and build local resilience to disasters and climate change. In addition, Nepal has adopted the Green, Resilient, and Inclusive Development (GRID) approach to scale up DRRM, preparedness and social protection, long-term green growth, climate action, and sustainable and inclusive development for all.

Nepal has prioritized mountain and climate change issues since preparation of the National Adaptation Programme of Actions (NAPA). Building on the previous initiatives, the government has been advocating the mountain agenda in national and global forums. This advocacy gained momentum following the UN Secretary-General Antonio Guterres's visit to Nepal in 2023, witnessing the disastrous impacts of climate change on the mountains and calling for immediate action.[2]

As a signatory to several global and regional conventions and commitments on DRR and CCA, Nepal has been working towards realizing these commitments to contribute to a sustainable and resilient country. Global and regional collaboration has enhanced coherence across policies, institutions, goals, indicators, and monitoring systems to implement key global frameworks for DRM and sustainable development. In fact, Nepal has developed its road map to achieve the targets by endorsing a strategic time-bound action plan, and the country has made steady headway in this direction.

2.8.1 Loss and damage

Nepal is exposed to multiple hazards, which makes the country prone to disasters. These disastrous incidents claim many lives and cause significant economic loss every year. A total of 9,886 small and large weather- and climate-related disaster incidents killed 1,173 people and incurred a total economic loss of NPR 6 billion between January 2020 and September 2022[3]. CCA and DRR

2 https://kathmandupost.com/columns/2024/05/14/people-mountains-and-climate-change

3 www.prc.org.np/assets/uploads/resource/596da13241ff1a682dbbd3dcede52a55.pdf

Workers with safety gear at construction work ©Tayar Nepal for USAID

policies have recognized economic and non-economic loss and damages caused by climate-induced disasters, but there is a need to develop tools to assess damage more accurately.

Nepal has conducted loss and damage assessments of the Melamchi floods that wreaked havoc in Melamchi Municipality of Sindhupalchowk district on June 15, 2021. The preliminary economic losses in Melamchi alone were estimated at NRs 1 billion. Loss and damage studies have been done only for sudden onset disasters in Nepal, such as floods and landslides, in the form of post disaster assessments.

The best defense against future shocks is to transform systems now, to build resilience by addressing climate change and to reduce the vulnerability, exposure, and inequality that drive disasters. As climate change impacts gather pace, stronger partnerships among institutions responsible for DRR, climate change action, planning, finance, and other sectors can ensure a coherent, integrated, and whole-of-society approach to DRR and CCA at all levels. Indigenous, local knowledge systems and practices can foster integration of indigenous practices into the design and implementation of DRR and CCA strategies and plans, while recognizing the importance to protect cultural heritage from disaster risks.

Nepal has put CCA at the center of its development plans and policies and has successfully piloted community adaptation programs through the implementation of the Environment-Friendly Local Governance (EFLG) Framework and Local Adaptation Plan of Action (LAPA), in collaboration with local government authorities. The government has formulated several progressive national and international policy process with the overall objective of building 'a sustainable and climate resilient Nepal. However, advancing disaster-resilient development in Nepal depends on the foundation work of exploring policy processes, building and enhancing an understanding of how the policy process is aligned, building synergy among these processes, identifying potential entry points, and taking the appropriate next steps.

Although the Ministry of Forests and Environment has prepared the National Framework on Climate Change Induced Loss and Damage in 2021, there is a knowledge gap on the assessment and costing of loss and damage, which calls for the formulation of a national plan associated with climate change with an institutional mechanism involving all three tiers of government.

BOX 1

Nepal's first tornado

On March 31, 2019, people living in Bara and Parsa districts were hit hard by heavy winds as Nepal recorded its first ever tornado. Nearly 2,500 houses were damaged, 30 people were killed, 1,150 were injured, and 2,890 families were rendered homeless, with severe damage to standing crops.

This disastrous tornado proved that Nepal is yet to be fully prepared for effective DRR efforts. In the wake of this disaster, the Department of Hydrology and Meteorology (DHM) has been monitoring monsoon flood data. However, proper monitoring requires the installation of adequate, modern scientific equipment in different parts of the country, empowering highly skilled scientists and training officials to make them capable of fulfilling timely forecasting, to brace for such events in the future.

Box 2

The Melamchi disaster

Heavy rainfall in the Melamchi area of the Sindhupalchok district on June 15, 2021 claimed five lives, with 20 more people missing and six injured from floods that adversely impacted large areas, including human settlements, agricultural land, river-based livelihood communities, and critical infrastructure, such as roads, bridges, hydropower plants, and electric poles. This unprecedented flood event carried large-scale debris from upstream, which was later deposited in downstream areas as far away as Dolalghat, which is approximately 54 km away from Melamchigaon.

Persistent floods over three-to-four days resulted in 337 fully damaged houses, displacing 525 families and destroying 259 enterprises in Melamchi and Chanaute Bazar. The debris flow also damaged intake sites of the Melamchi Drinking Water Project, which had just commenced delivering water to households in Kathmandu.

The Melamchi flood was a rainfall-triggered landslide, and it calls for monsoon preparedness and readiness before the disaster strikes. Managing cascading hazards requires hazard specific resources, not only to counter unexpected events, which also helps to address such events in a better way., This also supports to prepare and prevent unnecessary loss of lives and property.

BOX 3

The October 2021 flood

Nepal experienced an unprecedented offseason flood in October 2021 that left 60 people dead and 27 missing in landslides and floods triggered by rainfall across the country. Floods and landslides claimed 13 lives in Ilam, 16 in Panchthar, 12 in Doti, seven in Dhankuta, six in Humla, four in Baitadi, and two in Dadeldhura districts.

In addition, 23 people were reported as missing after a landslide struck Thalara Rural Municipality in Bajhang district, and four people were missing in Kailali's Lamkichuha Municipality. As many as 27 houses were damaged in the floods and landslides that were triggered by incessant rainfall, while 22 people were injured across the country from the same. The unseasonal heavy rainfall that occurred on October 17, 2021, damaged roads, bridges, hydropower stations, and other physical infrastructure in addition it washed away paddy fields in harvesting season in 31 districts across the country with estimated loss of NPR 6 billion.

BOX 4

The Mustang avalanche

The avalanche that came off Mt. Tukuche in Nepal's Mustang district on November 14, 2021 illustrates the kind of multi-hazards present in the Himalayan region. More than a dozen students fleeing a school were injured while escaping and there were reports of widespread livestock losses. Excessive post-monsoon snowfall could have contributed to the avalanche, which also resulted in flooding on a tributary of the Kali Gandaki. Nine people sustained injuries in their effort to avoid the avalanche in the Kobang region of Mustang district.

BOX 5

Widespread locust invasion on crops

Although Nepal is not necessarily a breeding ground for locusts (Schistocerca gregaria), a locust swarm entered the Terai region of Nepal on June 27, 2022. These locusts (also known as salaha in Nepali) subsequently engulfed 55 districts within a one-week period, affecting majority of the farmers throughout the country. These swarms mainly caused low to moderate damage to maize, vegetables, and fruit crops in the mid-hills of Nepal with scattered crop damage on 1,000 hectares of standing crops.

In response, MoALD formed a Desert Locust Technical Taskforce Committee to study the possibility of locust migration in Nepal from India and to suggest available mitigation options. The technical committee has been educating farmers and provincial-level technical staff on the management of locusts utilizing various digital platforms.

BOX 6

Rise in forest fires

In 2021, Nepal witnessed an unprecedented wildfire disaster recording 6,799 separate fire incidents affecting 75 out of 77 districts of Nepal, triggering authorities to issue a "red alert" and enforce school closures for four days. Although Nepal witnessed wildfires incidents every year, the 2021 forest fire was worse than normal, with smoke wafting across the mountains killing five people in 2021. On April 26, 2022, alone, western Nepal witnessed 108 separate forest fire incidents.

Data received from NDRRMA stated that more than 2,700 fire incidents were recorded between mid-November 2020 and end-March 2021, a period that covers most of the dry season. Various places, including the Kathmandu Valley, were covered in smoke due to raging wildfires across the country, leading to steep rise in the Air Quality Index that culminated in the closure of schools for four days.

Similarly, on March 2, 2021, a fire destroyed 58 houses in Meringden Rural Municipality in Taplejung district. A similar incident was reported in Phungling on May 2, 2020, when a fire broke out and destroyed 37 houses. NDRRMA, in coordination with MoFAGA, has been supporting provincial and local governments to control fires through training and by equipping municipalities with firefighting equipment and field gear. Despite capacity gaps, local and federal response units have been doing their best to control fires, but Nepal's fire service is more response-oriented and urgently requires measures to ensure that prevention and protection are also part of their strategy, in addition to establishing and funding a sustainable fire and rescue service institution.

BOX 7

Jugal landslide

The August 14, 2020, a landslide in Jugal Rural Municipality of Sindhupalchowk district killed 39 people in Lidi village. The landslide buried 29 houses and damaged 127 houses. The event occurred because of a cloudburst that triggered extensive, but shallow land sliding on the hillside above the settlement that transitioned to debris flow that ran down the channel network. The landslide entrained soil from the terraces in its path, destroying the flank of the settlement.

Although the affected families of Lidi village were moved to Baskharka after the landslide, high casualties resulted largely because people have continued to live in high-risk areas. The Government declared Sindhupalchowk a disaster-prone district and prioritized risk-assessment and relocation of people living in areas that are at high risk of disasters, particularly landslides.

BOX 8

Darchula emergency

Naugad and Mahakali Municipalities of Darchula district experienced flash floods and landslides due to persistent heavy rain on September 9, 2022. Flood caused by the Lasku and Mahakali rivers swept away 42 houses and two bridges, resulting in five fatalities and 11 injuries.

The Government, jointly with the District Disaster Management Committee and Nepal Red Cross Society, immediately provided relief materials to landslide victims. The local government and humanitarian actors on the ground rushed to respond to the immediate needs of the crisis and worked to ensure that governments across all tiers are better prepared to face future natural calamities while strengthening the capacity of first responders to manage the disaster.

BOX 9

Saptakoshi river flood

Several settlements in Belaka Municipality of Udayapur district and Barahachhetra Municipality of Sunsari district were inundated as the Saptakoshi river eroded the western embankment and entered settlements on August 3, 2022.

Floodwater entered settlements in five wards of Belaka and two wards of Barahachhetra after the flooded river eroded its western embankment in the Dumribote area. The rain-swollen river eroded around 300 metres of embankment in Dumribote. The river changed course and turned west through Dumribote and entered several wards of Belaka Municipality. Continuous and torrential rains led to the displacement of 1,500 households in Belaka Municipality. Local communities used local indigenous knowledge to control flash floods by placing whole bunch of bamboo trees with roots.

BOX 10

Post-monsoon disaster of 2022

In September and October 2022, late monsoon rains struck parts of western Nepal, namely Mugu, Kalikot, Humla, and Jumla districts in Karnali Province, Kailali and Achham in Sudurpaschim Province, and Banke and Bardiya in Lumbini Province. More than 10,714 people were rendered homeless due to floods and landslides in Karnali Province. Likewise, 36 people were killed in Karnali Province due to the floods and landslides that were triggered by incessant rains.

BOX 11

Unprecedented rainfall in Manang

The June 2021 floods displaced 59 families in Taalgaon of Nasho Rural Municipality in Manang district. Floods from the Marshyangdi river triggered by unprecedented rainfall inundated the village, disrupting electricity, transportation, and communication networks for weeks.

Flood water submerged homes, schools, and local offices and swept away bailey bridge thereby cutting off transportation in the district. The district headquarters, Chame, was cut off from road network for months when nearly 54 kilometers of roads were destroyed by floods and landslides.

Marsyangdi river and all rivulets in Manang had high flows, with surges risking human settlements and destroying cultivable land. Settlements like Danakyu and Pisang faced double risks of river cutting and sand deposition. Farmland was severely destroyed in Pisang, Bhratang, and Bhraka.

According to a study published in 2022[1], Marsyangdi and Budhigandaki rivers experienced significant increase in total water flow over the last 20 years, mainly due to the rise in rain-induced flows. In the rain-shadow region, which has never been affected by the monsoon, the main reason for the 2021 floods was excessive rainfall in a short period.

1 https://meetingorganizer.copernicus.org/EGU22/EGU22-10735.html

BOX 12

Monsoon havoc (2023)

The 2023 monsoon caused significant damage to human lives, property and economy. A total of 5937 households were directly affected, claiming 63 lives. Sankhuwasabha district suffered the most with an increasing number of human deaths and missing people. Similarly, 1,574 households were affected apart from monsoon incidents amounting to the direct loss of more than USD 3.5 million. The table below presents the details of monsoon impact during 2023:

SN	Incident	No. of Incidents	Death	Missing	Injured	Affected Households
1.	Flood	142	16	21	7	3726
2.	Landslide	459	45	9	50	1948
3.	Incessant Rainfall	168	2	0	12	263
Total	769	63	30	69	5937	

Source: http://drrportal.gov.np

BOX 13

Jajarkot Earthquake (2023)

A 6.4 magnitude earthquake struck Jajarkot district on November 3, 2023. Recurring aftershocks since the earthquake left the local people terrified, forcing them to leave their houses and stay in open spaces. The epicenter was in Ramidanda in Jajarkot district of Karnali Province. A total of 54 people (101 in Jajarkot and 53 in Rukum West) lost their lives and 356 were reported injured. While 26,657 houses (9,894 in Jajarkot, 16,570 in Rukum West, 151 in Salyan, 25 in Rolpa, 9 in Rukum East, 5 in Jumla and one each in Dailekh, Kalikot and Baitadi districts) were completely damaged, 35,455 houses were partially damaged.

The government immediately responded by providing lifesaving emergency relief, temporary shelters, and humanitarian assistance to the affected population with the active support of and contribution by local administration, all three security forces, humanitarian agencies, development partners, private sector, and civil society.

Earthquake wreaks havoc in Jajarkot. © Tayar Nepal for USAID

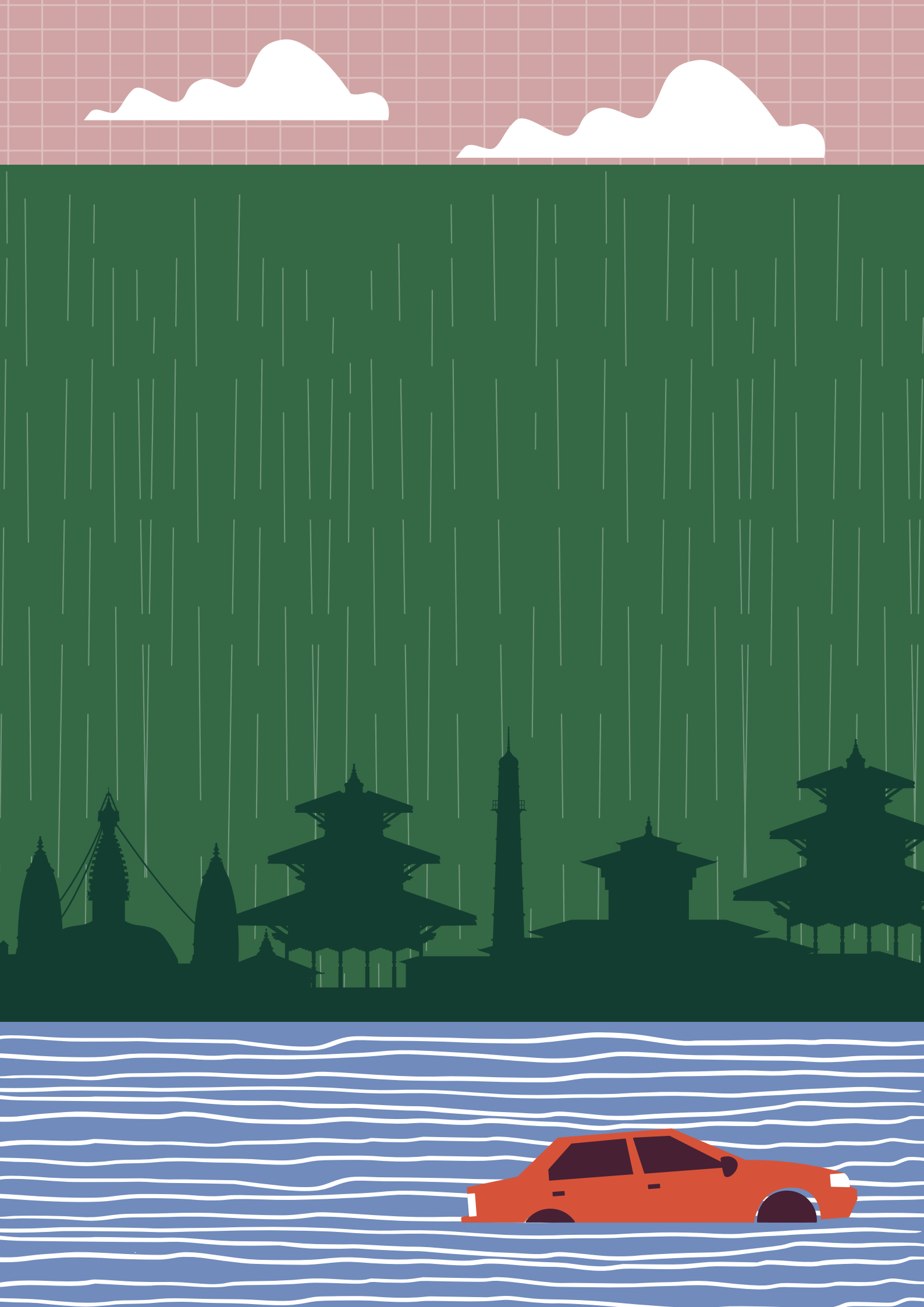
BOX 14

Record rainfall in Kanchanpur

The Dodhara observatory of Kanchanpur district experienced unprecedented rainfall of 624.0 mm on 8 July, 2024, an all-time highest record over the country. The south-western part of Sudur Paschim Province came to a complete standstill due to severe flooding/deluge. On this day, not only did Dodhara rainfall station recorded 624.0 mm, but also Hanumannagar and Sundarpur rainfall stations recorded higher amount of rainfall, i.e. 573.6 mm and 555.8 mm respectively.

The unprecedented rainfall was triggered by the development of a low-pressure area over the south-western part of Sudur Paschim Province, intertwined with a strong westerly trough developed over time. As per the Department of Hydrology and Meteorology (DHM) statistics, this is the highest ever rainfall recorded in the past 78 years in Nepal.

Situation of Kanchanpur district after experiencing unprecedented rainfall. ©Department of Hydrology and Meteorology



Chapter 3
Disaster Risk Communications

3.1 Communicating disaster risks

Nepal has made substantial progress in disaster risk communication in the last six years and since the establishment of NDRRMA. The NDRRM Act identifies risk communications as an integral component in building a resilient society able to withstand and recover after disaster events. The main aim of risk communication is to create a shared understanding of risk among all involved stakeholders through coordination, collecting and disseminating information, planning for a crisis and crisis management. In fact, Nepal is one of few countries in the world to have identified risk communication as a key priority.

The role and importance of Information Education and Communications (IEC) in disaster risk reduction and management has been clearly stated in the existing policies and regulatory frameworks. Various acts, policies, action plans etc. have addressed the role of IEC. The NDRRMA has developed National Disaster Management Information System to collect, analyze, store and communicate information and data on disaster management.

The Disaster Risk Reduction National Policy (2018) also undertakes the policy of enhancing the understanding of disaster risk and ensuring access to information related to disaster risk at all levels and categories by developing informative programs for public awareness and enhancing access to disaster related information, awareness, and learning up to the community level through the effective use of information and communication media.

The government has initiated its communication and public awareness work by registered 'pages,' 'accounts,' and 'channels' on social networks Facebook[1], Twitter[2] (currently X)[3], and YouTube . Through these media, informative messages of various forms have been created and disseminated in various local languages. So far, the NDRRMA's official Facebook page has reached 160,000-page likes (2024 May), while 15,900 people have directly followed the X account. More than 1500 people have subscribed to the YouTube channel. More than seven thousand users have joined the Viber channel started last year.

A draft disaster risk communication strategy has been prepared to enhance public awareness regarding disaster risk reduction, conduct planned communication to develop the information system, and increase access to and understanding of disaster risk information to change the behaviors of the citizens. At present, suggestions from all sectors are being collected on this strategy. Nepal is committed to promoting "Information for All" initiative. Public awareness activities have been carried out even beyond the incidents of disasters, using devices such as smart sirens installed in various parts of the country. While NDRRMA is the central repository for disaster risk communications, it has been maintaining the quality and standards of IEC materials produced by development partners and organizations working in the disaster sector.

NDRRMA has assigned a designated spokesperson for regular contacts with the media. In addition, a communication team with some members is active, and development partners and organizations working in the humanitarian sector are providing supporting assistance to the NDRRMA in this quest. Keeping in view the importance of the participation of the communication sector, a communication thematic group has been formed in the National Platform for Disaster Risk Reduction.

The Disaster Information Management System (DIMS)[4] is in place to provide real-time information about hazards and disaster events, affected populations, and casualties. The Building Information Platform Against Disaster (Bipad) national portal is an excellent example of how an integrated disaster repository can help guide informed decision-making at the federal, provincial, and local levels. It has the potential to create systemic shifts in disaster

1 https://www.facebook.com/NDRRMA
2 https://x.com/NDRRMA_Nepal
3 www.youtube.com/NDRRMA
4 https://bipadportal.gov.np/

governance in Nepal, conforming to the global principles of the Sendai Framework. It supports all three tiers of government and stakeholders to share early warning information, map risks, and provide emergency response operations that help agencies coordinate and carry out timely disaster management activities.

The expanded mass media outreach, especially radio, television, online news portals, and new media all contributed to produce and disseminate DRR content. There is an increasing media attention to produce contents on DRR while paying attention to GEDSI considerations. Nepal is developing a disaster risk communication strategy and integrating and localizing DIMS (Bipad portal) to further enhance communication system.

NDRRMA believes that all parts and components of society have a role to play in disaster risk reduction and management. This aspect has also been considered during communication and public awareness activities. As national celebrities, local artists have 'charm' and 'followers,' they are involved in communication work. Audio visual content involving actors is especially favored by the public. In addition, materials have also been produced in conversation with experts for the purpose of conveying an educational message about the subject. Film actors, songwriters, musicians, folk singers, comedians, celebrities of various local languages and literature have been involved.

NDRRMA has also given prominence to direct communication with influential and thought-forming leaders of the society, volunteers, youth and students. It regularly discusses the current situation of disasters with relevant agencies through disaster dialogues, and the problem is identified, and suggestions are made about the solutions. The disaster dialogue has been broadcast directly through social media (especially facebook) to reach the public. It has been working as an 'Open Source' concept to enhance risk communication.

The absence of proper information and communication during a disaster can pose risks of further damage to people's wealth and worsen the problem. Effective communication also helps to make post-disaster restoration and reconstruction work more effective. NDRRMA has been working to provide timely information through media to save people's property and lives.

3.1.1 Media products using regional and local languages

Daily Bulletin - Daily disaster bulletin covering 24-hour disaster events, damage and response details. 1521 issues published so far. https://bipad.gov.np/np/daily-bulletin

Monthly Bulletin - The National Disaster Bulletin is being published digitally throughout the month of Nepali, which contains significant disaster related activities from the authorities. So far 26 issues have been published. https://bipad.gov.np/np/national-disaster-bulletin

Magazine nature of disaster analysis magazine. Two issues published so far. https://bipad.gov.np/np/disaster-resilience-nepal2

Special Bulletins - 30 days, 60 days and monsoon period bulletins are being published. The 30-day and 60-day bulletins of this monsoon have already been published.

Situation report - Situation reports and incident special study reports have been published when major disasters occur.

Official Website - Information, News, Documents, Real Time Update - https://bipad.gov.np/np/

Official Facebook Page – https://www.facebook.com/NDRRMA

Official Twitter (X) Account - https://x.com/NDRRMA_Nepal

Official YouTube Channel - www.youtube.com/NDRRMA

Disaster Notification on Viber (NDRRMA) - https://vb.me/ndrrmaviberchannel

Television Program - In collaboration with Nepal Television, weekly 'Safe Nepal' program was conducted. This year at the contract stage.

Drama - Drama 'Lay Prakriti' prepared in collaboration with Mandala Theater to increase awareness about the disaster. A special show in Kathmandu.

Cartoons - Last fiscal year, 27 cartoons related to disasters were prepared in collaboration with Nepal Academy of Fine Arts and Nepal Cartoonist Club. An exhibition was held in the hall of the institution for a week. There is a plan to publish a book containing cartoons.

Disaster related posters, pamphlets, infographics in local language are being published and distributed to the public through the provincial and local governments.

organized a panel discussion on seismic retrofitting for safer urban construction, which was aired through AP1HD national TV . The program raised stakeholder and public awareness on implementation of NBC as "everybody's responsibility." It was also aired on local TV channels, including Sungava Television (Surkhet), Baba Television (Dhangadhi, Kailali), and Parywaran Television (Lalitpur). In total, the program reached around 230,000 viewers through TV and online platforms.

3.1.2 Communication for multi-hazard There has been an improvement in weather forecasting, however, due to climate change and other factors, increasing disparity remains a challenge. Thus, it is important to build trust in weather forecasting and early warning systems. In addition, Nepal's geographical diversity and complexity as well as ethnic, linguistic, and cultural diversity require resources to produce content in multiple languages. In the overall stages of the disaster, representatives at all levels, including teachers and community leaders considered as the reliable sources of information have the responsibility to provide sufficient, correct, timely, yet concise information to public.

Special notices and bulletins have been published and broadcast in emergency situations. For example, in collaboration with the Department of Hydrology

Galthum Market of Helambu Gapa damaged by Melamchi flood. © NDRRMA.

and Meteorology, informative audio-visual materials (including in local languages) have been released in likelihood of heavy rains. In addition, it has been publishing situation reports on major disaster incidents and periodic reports during monsoons. For example, after the Jajarkot earthquake, seven situation reports have been published.

Provision of disaster risk reduction through information, communication, and public awareness in policy and legal documents such as laws, policies and national strategic action plans is an opportunity for disaster risk communication. In addition to this, the increasing awareness and interest of the media, private sector, non-governmental organizations and the community, the easy availability of social media and the access of citizens to it have given the opportunity to communicate even with limited financial resources. Modern technology for communication is evolving rapidly, and citizens' access to these technologies is expanding as well.

3.2 Multi-hazard early warning system

Nepal faces multiple hazards, that are often cascading. However, the early warning system adopted till date is predominantly on floods. Building on the success of EWS for floods, Nepal has made considerable progress in realizing a multi-hazard early warning throughout the country.

Nepal's DRRM Act identifies early warning system as an integral tool to disseminate alerts and warnings in the event of a disaster. It requires the government to ensure that a national early warning system is developed and operated. The 12th meeting of the executive committee (Magh 14, 2078) decided to prepare an action plan for multi-hazard early warning system with coordination of relevant ministry and departments. Consequently, the National DRR Strategic Plan of Action (2018-2030) prioritized developing Multi-Hazard Early Warning System (MHEWS) for disaster preparedness.

Nepal has established a good practice of communicating hydro-meteorological hazards through data portals . The systems provide real-time and three-day rolling information and warnings about risks due to hydro-met hazards, like rainfall and floods. Nepal is promoting impact-based multi-hazard early warning system to cover all hazards, simplifying risk communication to all media and stakeholders, and preparing to adopt Common Alert Protocol (CAP) aimed at increasing lead-time for MHEWS. The early warning system is supported by the

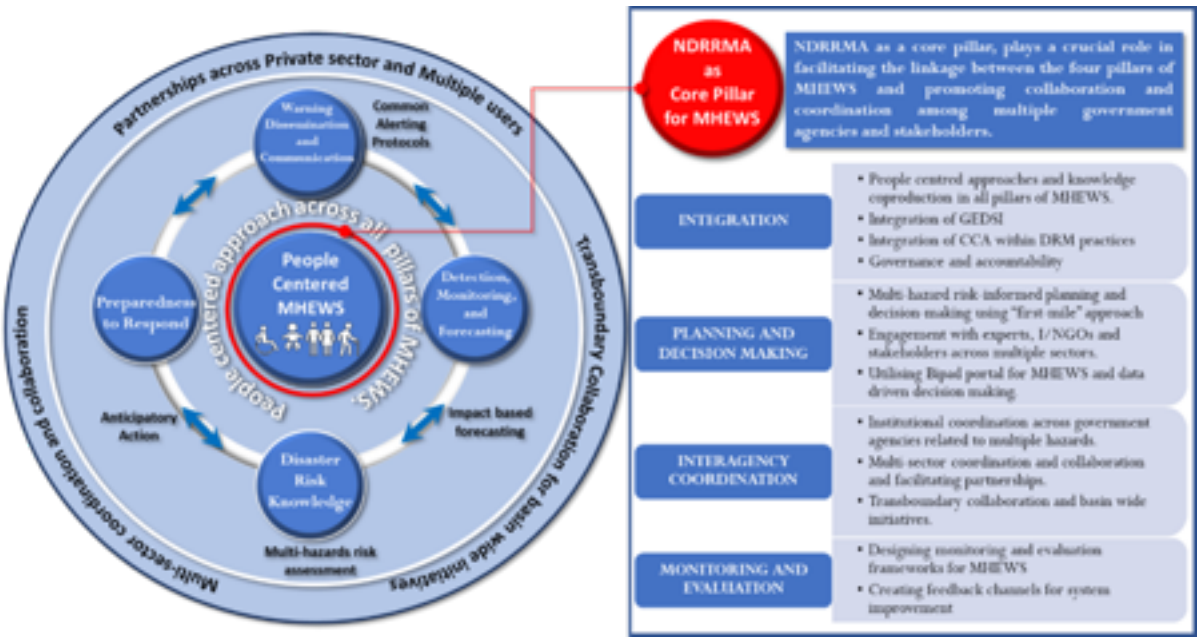
enforcement of real-time hazard monitoring through seismic stations, hydro-metrological stations, lightning detection centers, monitoring of major glacier lakes, and regular assessments. The EOCs played vital roles in the dissemination of emergency information for rescue and response at the time of disaster.

3.2.1 Conceptual framework of MHEWS

The conceptual framework of MHEWS outlines a comprehensive vision that encompasses all four essential pillars—disaster risk knowledge; detection, monitoring and forecasting; warning dissemination and communication; and preparedness to respond. At the core of this framework lies the NDRRMA, which connects and integrates a people-centred approach that spans all four pillars of the MHEWS. Furthermore, the NDRRMA, as a core pillar, fosters partnerships with the private sector, engages with multiple sectors and users of MHEWS for its sustainability, and facilitates transboundary collaboration for basin-wide initiatives (Fig. 1).

Nepal has graduated from a single hazard (only floods) to a multi-hazard EWS. Impact based forecasting for landslides has been piloted in most of the hilly and mountainous districts. Similarly, NDRRMA has installed smart sirens (audio emergency warning and notification system) in 49 vulnerable locations of various parts of Nepal. Nepal has piloted a new wildfire monitoring system based on the data received from the space-based technology—Moderate Resolution Imaging Spectroradiometer (MODIS) from NASA's Terra and Aqua satellites, which provides an all-in-one solution to address challenges through the application of hazard zones, vulnerable areas, accessibility, affected settlements, mitigation options, and future predictions to support disaster preparedness.

Fig. 1: Conceptual framework for MHEWS in Nepal.



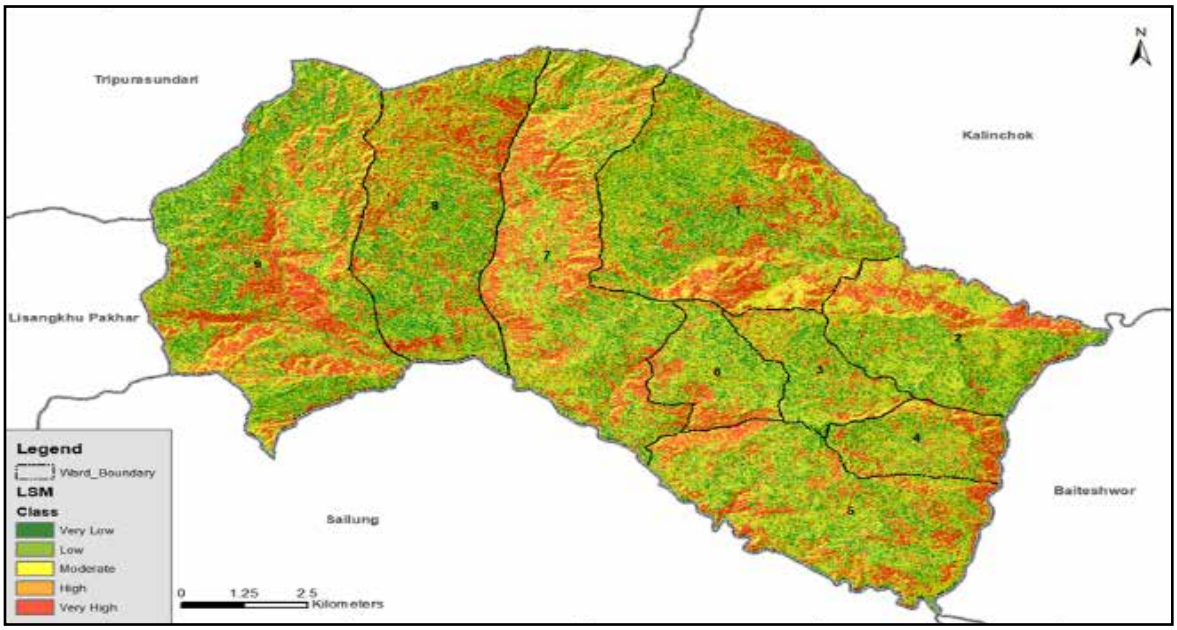
BOX 1

Piloting Landslide Early Warning System (LEWS) in Bhimeshwor Municipality

USAID's Tayar Nepal has piloted Landslide Early Warning System (LEWS) across three different scales (municipal, sub-catchment and local) in Bhimeshwar municipality. The project "ALERT Bhimeshwor" has conducted detailed landslide susceptibility mapping and geotechnical study and developed Factor of Safety Modeling to delineate the instrumentation areas and hotspot region. Based on this study, the rain gauge and soil moisture instrumentation were carried, extensometer has been placed and the information obtained from these instruments have been integrated into the Municipal Emergency Operations Center (MEOC) to enhance preparedness and response efforts. Throughout the implementation of ALERT Bhimeshwor, the Institute for Himalayan Risk Reduction (IHRR) has conducted consultations with relevant stakeholders and adhered to the Four Pillars of LEWS to ensure effective and inclusive risk management practices.

The project involved gathering data from various prepositioning factors including topography, geology, soil, socio-economic factors, rainfall patterns, land-cover, and historical landslide records. This data was collected from both primary sources, such as consulting with residents and secondary sources, and used to create a comprehensive landslide inventory. The characteristics of landslides were observed and evaluated to better understand how they respond to different factors causing landslides. The approach prioritized obtaining high-quality and reliable data from diverse sources, including satellite imagery and drones. A total of 67 landslides have been digitized from various sources such as VCA, satellite images and other sources of data for the preparation of landslide susceptibility.

Figure 2: Updated Landslide susceptibility Model of Bhimeshwor Municipality



Disaster Preparedness and Response Tabletop Exercise at Dhangadi, Kailali. © Tayar Nepal for USAID

3.2.2 Conceptual framework of MHEWS

It is found that a significant increase in annual maximum temperature in Nepal has been resulting in glacier retreat, shrinkage, and fragmentation, thereby leading to an increase in the number and area of glacial lakes. ICIMOD has mapped 3624 glacial lakes equal to or larger than 0.003 km2 (approximately 2.4 times bigger than a standard olympic size swimming pool) in the three basins (Koshi, Gandaki and Karnali Provinces). Of these, 2070 lakes are in Nepal, 1509 in the Tibet Autonomous Region of China, and 45 in India. A total of 47 glacial lakes are potentially dangerous out of which 31 are at the highest risk of breaching and remaining GLOFs need close and regular monitoring.

3.2.3 Decision support system

Realizing the fact that generating accurate and actionable early warning information is heavily dependent on monitoring and observation data and provides a foundation for effectively managing and reducing disaster and climate risks, Nepal has built institutional mechanism to operationalize several Decision Support Systems (DSS) for transforming hazard information into impact-based forecasting to aid decision-making across multiple sectors. This reliable, accurate, and actionable hazard information is key to supporting decisions, adaptation and preparedness at all levels: three tiers of governments, communities, humanitarian actors and other sectoral stakeholders.

3.2.4 Anticipatory humanitarian actions

Nepal has witnessed rapid paradigm shift from a reactive humanitarian response to proactive early action and preparedness, particularly in terms of combining weather forecasting with disaster risk information. Despite this, there are challenges associated with uncertainty in weather forecasts for multiple hazard risks, such as floods, landslides, droughts, heat waves, cold waves and forest fires.

In 2023, the UN Secretary General announced the "Early Warning for All" initiative. Nepal has been shortlisted in the top thirty countries for the EW4ALL initiative. Nepal has harnessed the standardized technological solutions like Cell Broadcast, CAP, Location Based SMS, AI, data analytics, etc. for inclusive last mile information dissemination while ensuring the trust and quality

National Dialogue on Anticipatory Action organized by NDRRMA. © NDRRMA

of the EW messages. It has taken proactive steps towards developing and implementing a MHEWS and related impact-based action plans that are inclusive of and tailored to all groups at greater risks due to discrimination, marginalization, disability, remoteness, language barrier, etc.

In 2023, Nepal successfully organized three national dialogues on anticipatory actions. The first two dialogues were convened with the goal of cultivating a forward-thinking approach to disaster risk management, one that is firmly rooted in proactive measures rather than reactive responses. It was mainly focused on risks flood, landslide, heat wave, cold wave and health hazards; disaster risk financing (including risk transfer mechanisms; and Shock Responsive Social Protection (SRSP). Nepal co-hosted the 7th Asia-Pacific Dialogue Platform in June 2023. The platform stressed on the importance of incorporating multi-hazard risk assessments into anticipatory action approaches, and of strengthening multi-hazard early warning systems in the region. The platform was a stepping stone towards raising the profile of innovative early action pilots, not only in Nepal but across the Asia-Pacific region.

Key highlights of the platform include developing a comprehensive roadmap for anticipatory action; integrate anticipatory action into local-level structures, plans and budgets to ensure its effective implementation and sustainability; and establish a dedicated, multisectoral coordination body for anticipatory action to enhance collaboration, coordination and information-sharing among relevant stakeholders.

3.2.5 National consultation on EW4All

Nepal organized national consultation on EW4All in September 2023. The primary objective of the consultation was to review the current state of early warning systems and assess the progress in implementing the four pillars of EW4All. The dialogue explored linkages and alignment with the ongoing initiatives and consolidated stakeholders' commitments to strengthen early warning systems in Nepal.

Discussions focused on how to improve understanding of the EW4All initiative among relevant government and non-government agencies, academic institutions, and private sector, and forge broader consensus and awareness on the national coordination mechanism. Consultation also sought to reach agreement on a process for identifying national and sub-national policy, technical, financial and other gaps across the four pillars of the EW4All Action Plan, and a roadmap to achieve this.

To this end, NDRRMA has compiled a repository of key messages and tools (across hazards, issues, languages, etc.) as a building block of the future Common Alerting Protocol for the country. Similarly, in the lead up to the COP28, development partners have considered the ongoing planning for MHEWS as a strong foundation to increase investments as part of a unified disaster risk reduction financing strategy (bringing together national and international resources) to realize the USD 615 million for MHEWS to save lives and protect livelihoods, hence reducing loss and damage in the longer-term.

National consultation on the Early Warnings for All (EW4ALL). © NDRRMA.

CHAPTER 4 STRENGTHENING DISASTER RISK GOVERNANCE

4.1 Disaster risk governance

Nepal's current disaster governance landscape is guided by its Constitution and the DRRM Act (2017). The Constitution stipulates that DRRM is the sole authority of local government, and a shared authority among federal, provincial and local governments. On September 24, 2017, Nepal's parliament enacted the new Disaster Risk Reduction and Management Act (2017). The Act is considered more progressive as its approach to disaster is more comprehensive and recognizes both risk reduction and management as integral parts of the task. It proposes a clear multi-tier institutional structure of disaster risk reduction and management (from federal, provincial, district and local levels).

NDRRMA, established in December 2019, is the apex body for disaster management in Nepal. The DRRM Act (2017) has provisioned the establishment of NDRRMA to create an enabling environment for institutional mechanism at the federal level. The establishment of NDRRMA is a flagship milestone that is mandated to lay down policies, plans and guidelines for DRRM, coordinate and implement DRRM-related functions in the country. Its mandates include leading, facilitating and supporting federal, provincial and local governments on disaster risk reduction, response and reconstruction.

The DRRM Act has made the provision of the National Council for Disaster Risk Reduction and Management to discharge disaster related functions effectively. The Council is chaired by Rt. Hon'ble Prime Minister and the Disaster Risk Reduction and Management Executive Committee is chaired by the Hon'ble Home Minister. The Act has made the provision for the executive head of this authority to be the member-secretary of the council and committee. This authority has the right to act as the central resource body for disaster risk reduction and management.

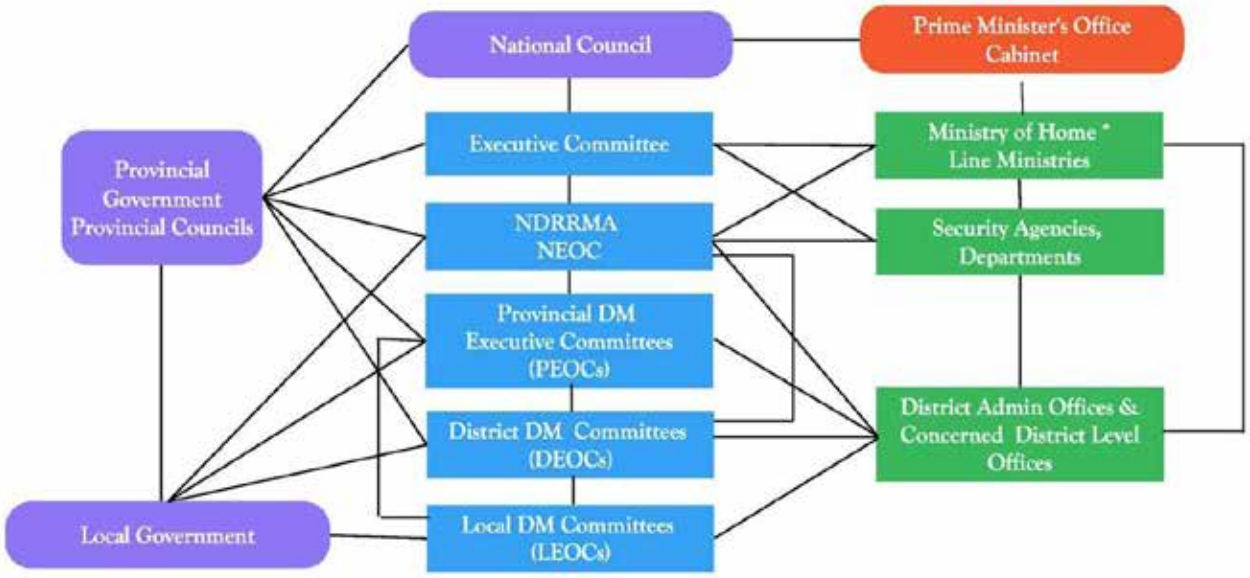
In addition to the federal government, seven provincial and 753 local level governments are given several exclusive and concurrent powers and duties of governments (including mandates for disaster risk management). The transition to federalism has provided a unique opportunity for the government and stakeholders to build on past progress and limit current and future threats by prioritizing stronger disaster risk management at all levels. The DRRM Act (2017) and Local Government Operation Act (2017) have established institutional structures and provided them with mandates to deliver in the spirit of the Constitution at various levels.

DRRM governance has been designed in line with the federal governance structure. The country has implemented the National Policy for DRR (2018), which is supported by the National Strategic Action Plan for DRR (2018—2030) in line with Sendai Framework for DRR. This strategic plan of action is the primary tool to promote and implement DRR activities at all levels. Provincial and local governments have developed essential legal instruments and established their own institutional set up to implement DRRM.

The DRR Strategic Action Plan has several strategic activities aimed at building DRM capacity. The government has harmonized multiple conflicting local level planning tools jointly with the Ministry of Federal Affairs and General Administration (MoFAGA), National Planning Commission (NPC) and relevant organizations. A case in point is the approval by the 23rd National Executive Committee of the Local Disaster and Climate Resilience Framework that was prepared in conjunction with the Ministry of Forests and Environment (MoFE), MoFAGA and NPC.

Besides, the local government has prepared Local DRM Act, Local Environment and Natural Resources Protection Act, Standard Operating Guidelines for Emergency Operation Centres, Guidelines for Local Disaster Management Fund Operation, and Guidelines for preparing Local Disaster and Climate Resilience Plans (LDCRP) to support local governments and endorse their own context specific DRM acts, policies, plans and procedures. While such activities exist as highly encouraging steps, institutionalizing these tools remains a challenge. Documents such as local DRR Strategic

Figure 1: Institutional arrangement of DRRM governance in Nepal



Action Plan Guideline (2021)[1] and Guideline for Local Level Planning (2021)[2] guide plans and actions initiated by local governments.

4.2 Establishment and strengthening of institutional structures

Nepal has established NDRRMA in 2019 as an apex institution to coordinate, facilitate, operate and manage the country's overall DRRM activities. The DRRM National Council is chaired by Rt. Honorable Prime Minister and provides strategic direction and approves disaster-related policies and strategies. The Executive Committee prepares national plans and policies for Council's approval; approves integrated and sectoral policies, plans and programmes on disaster risk reduction, disaster response and disaster recovery subject to the national plans and policies laid down by the Council, outlines roles and responsibilities of the ministries, departments and other government agencies, private and non-government organizations, and enhances the institutional capacity of the federal, provincial, district and local levels on disaster management. The EC, chaired by the Hon'ble Minister of Home Affairs, coordinates with line ministries to formulate DRRM policies and strategies. NDRRMA serves as the secretariat to both the National Council and Executive Committee (Fig. 1).

The federalization process provides opportunities to clarify and strengthen the roles of provincial and local governments in disaster management. Provincial governments have prepared their respective provincial DRRM laws. It coordinates between federal and local governments. Local governments have been tasked with drafting their own disaster response plans and laws. It works directly with communities at all points of the disaster management cycle, from mitigation to resettlement, as mandated by the Local Government Operation Act (2017). The Act lists disaster management-related functions of the local governments. Under these functions, there are twelve specific authorities, including making plans and policies for disaster preparedness, mobilizing municipal police for rescue and relief, mapping of risk areas and relocation, coordination with provincial and federal governments and non-governmental organizations, and data management and research among others. The act has also mandated the establishment and operation of disaster management funds and the mobilization of resources.

4.3 Transitioning from response-centric to resilience building

As Nepal has witnessed increase of disasters in terms of severity and frequency, the country has moved towards a comprehensive federalized disaster governance. The Constitution mandates disaster management at all three levels of government by allocating shared responsibility

1 MoFAGA 2021. Local DRR Strategic Action Plan Guidelines 2021. https://mofaga.gov.np/news-notice/2407

2 National Planning Commission 2021. Guidelines for Local Level Planning 2021. https://npc.gov.np/images/category/220106044450Guideline%20for%20LP%20Planning.pdf

to federal, provincial and local governments. In addition, following the global mandate of the Sendai Framework for Disaster Risk Reduction (SFDRR), Nepal has demonstrated its commitment to DRR by including the key provisions of SFDRR in the National Disaster Risk Reduction Strategic Action Plan (2018—2030).

After the formation of NDRRMA, Nepal has transitioned from being a response-centric to a focus on risk reduction and resilience building to enhance resilience in withstanding disasters. Disaster risk reduction and management is focusing on three key areas of the transition process: (i) from disaster relief to disaster prevention; (ii) from the combat of sole disaster prevention to comprehensive disaster reduction; and (iii) from disaster loss reduction to disaster risk reduction. For example, the Monsoon Preparedness and Response Plan (2077) has been developed as an actionable and results-oriented guiding document and has delineated roles and responsibilities of relevant stakeholders for preparedness and response based on stakeholder consultations, technical and expert level analysis and risk estimation through past experiences. While the provincial government coordinates between federal and local governments, the federal government has established and strengthened several departments under different ministries to enhance capacity for response, preparedness and risk reduction.

The country has dedicated significant resources to strengthening disaster governance (Russell et al., 2021)[3]. Today, Nepal is moving from sectoral risk reduction to comprehensive federalized disaster governance and has implemented legislations with effective institutional arrangements, and operational mechanisms to comply with the constitutional mandate in ensuring disaster resilience. This transition has provided opportunities to institutionalize a much more decentralized system of disaster risk management in Nepal.

In each province, there is a provision of the Provincial Emergency Operation Centre (PEOC), which is part of the larger EOC network. The principal task of the PEOC is to serve as a coordination and communication point for disaster information across the provinces by coordinating with local and national emergency centers to prepare for and respond to disasters. The local government works directly with communities with the mandate of the establishment and operation of disaster management funds and its judicious mobilization. These institutions follow the principle of inclusion, ensuring representation of the 'vulnerable groups' such as women and people from marginalized communities.

4.4 Formulation of legal and regulatory frameworks

Nepal has formulated progressive legal and regulatory frameworks. It includes a wide range of laws, regulations and policies designed to prevent, prepare for, respond to, and recover from disasters (Fig. 2). The 18 priority actions stated in the National DRR Strategic Plan of Action are aimed at ensuring active participation of all stakeholders in its implementation by identifying and mainstreaming risk sensitive activities in the development process of federal, provincial and local level for risk reduction.

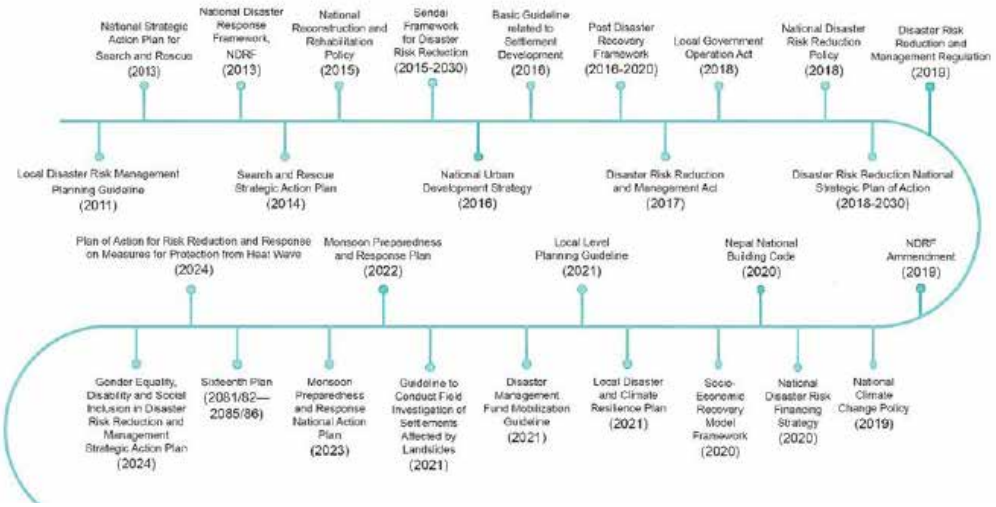
New constructions following the National Building Code and retrofitting programmes of school and hospital buildings are important achievements in the risk reduction sector. Similarly, the local disaster risk management plans and district disaster preparedness and response plans implemented from district to the community level and emergency operation centers established and operated from the center to the district level are some significant efforts for risk reduction. Processes and procedures are in place for the formulation of legal instruments. For instance, the guideline formulation process is led by a task force as decided by the Executive Committee the draft of which is then taken to the Executive Committee as agenda for endorsement by the committee. The formulation of these legal instruments has strengthened DRR governance.

4.4.1 Disaster Risk Reduction and Management Act (2017)

The DRRM Act is more comprehensive and addresses the complex dynamics of all phases of disaster management. The endorsement of DRRM Act has mandated the formation of a national council, executive committee and an authority, as well as the delineation of roles, responsibilities

3 https://doi.org/10.1016/j.apgeog.2021.102516

Figure 2: Key legislations endorsed for effective DRRM governance



and accountabilities for disaster management. In this new framework, NDRRMA plays a crucial role in facilitating coordination and collaboration mechanisms amongst all for comprehensive disaster management.

Under this law, along with the National Council and EC at the federal level, disaster management councils are formed at the provincial level and committees at the district and municipal levels. The Act was formulated to address disaster risk management with a comprehensive approach focusing on different stages of disaster management regime cycle, from preparedness to risk reduction mitigation and response to rehabilitation. It provides a well-structured institutional setup from the national to local levels to steer risk reduction activities.

Challenges, however, remain on: (a) effectively implementing action plans at the provincial and local levels primarily due to inadequate technical and functional capacities; and (b) financing challenges to invest adequately in DRM. In some cases, municipalities have either not established disaster management committees or established their local emergency operation centres or formed DM fund guidelines or set up DM fund account.

Realizing the growing importance on the role of private sector in disaster risk reduction and management, NDRRMA has collaborated with private sector to foster business resilience and encouraged their active participation in DRRM efforts. Private sector continues to contribute to DRRM and resilience building by participating in review and reflection sessions, enhancing the capacities of relevant stakeholders, ensuring institutional engagement, mobilizing resources, facilitating timely monitoring and surveillance, and engaging in policy advocacy.

4.4.2 National Policy for DRR (2018)

The National Policy for DRR (2018) was endorsed to build a safer, more adaptive and resilient nation by reducing existing risks and preventing new and potential risks. The policy ensures the government's long-term commitment towards making Nepal a safer and resilient country, and considers national needs as well as international agreements, which is more focused on achieving the targets and commitments made in the Sendai Framework for DRR, UN SDGs, and the Paris Agreement. It identifies 59 activities to cover all sectors and designates roles and responsibilities to sectoral ministries to carry out their respective activities.

4.4.3 National DRR Strategic Plan of Action (2018—2030)

The National DRR Strategic Plan of Action (2018—2030) adopted a holistic approach to uphold sustainable development by mainstreaming DRR in the development process. Inspired by the guiding principles of the Sendai Framework for DRR (2015—2030), this action plan has identified four priority areas and 18 priority actions. Under each priority action, the strategic activities are identified for 2018—2020 as short-term interventions, from 2018—2025 as medium-term interventions, from 2018—2030 as long-term interventions, and continuous actions.

This Strategic Plan of Action set targets for reducing disaster losses considering the targets set by the UN SDGs, to substantially reduce the impact of disasters nationwide. This Plan of Action emphasizes the need for a participatory and systematic approach as well as decentralization of DRR. Even after setting strategic priorities to build national capacity for enhanced knowledge and skills to understand risks, there remains a need to strengthen DRRM governance and technical capacity at the federal, provincial, and local levels. In addition to integration into national DRR planning mechanisms, this strategic plan serves as an entry point to build institutional capacity in disaster response.

4.4.4 Local Government Operation Act (2017)

The Local Government Operation Act (2017) identified functions for all aspects of DRR under the duty, responsibility, and rights of rural and urban municipalities. It also includes activities related to grant permission of building construction, monitoring and evaluation as per the National Building Code and Standards, including policy, planning, programme formulation, implementation, monitoring, regulation and evaluation to develop safer communities. The Act also mandates local governments to take initiatives on DRRM mainstreaming in development, risk reduction and natural resource management.

4.4.5 Sixteenth Plan (2081/82—2085/86)

Nepal's Sixteenth Development Plan (2081/82—2085/86) has envisioned a planned, sustainable and resilient urbanization and settlement development. The plan places high importance for disaster risk management linking with rapid urbanization and the necessity of DRR for sustainable development and is flexible and adaptive in cognizance of the changing nature of risks in Nepal. It attempts to adopt a transformative strategic approach reflecting its alignment with SFDRR, recognition of disaster risks and phased implementation of a resilient urban infrastructure development.

A set of quantitative objectives allow operationalizing the aims through identifying priority actions, providing a roadmap for planned urban development, incorporating DRM aspects in sectoral plans, exploring public-private investments, ensuring inclusivity, addressing emerging risks, promoting risk governance and disaster resilient approaches through institutional strengthening and capacity building activities.

4.4.6 National Disaster Risk Reduction and Management Authority (NDRRMA)

NDRRMA is envisioned to function on behalf of both the DRRM Council (DRRMC) and the Executive Committee. NDRRMA works as a secretariat to both mechanisms and its Executive Chief (EC) works as the Member Secretary. While the institutional structure of NDRRMA is represented well and led by powerful personalities, the implementing body led by EC was given a limited role of drafting plans, implementing decisions of the Council and Executive Committee, monitoring decisions, and monitoring inter-ministerial compliance of EC decisions and reporting. NDRRMA is mandated to facilitate, support, and coordinate with all agencies on DRRM.

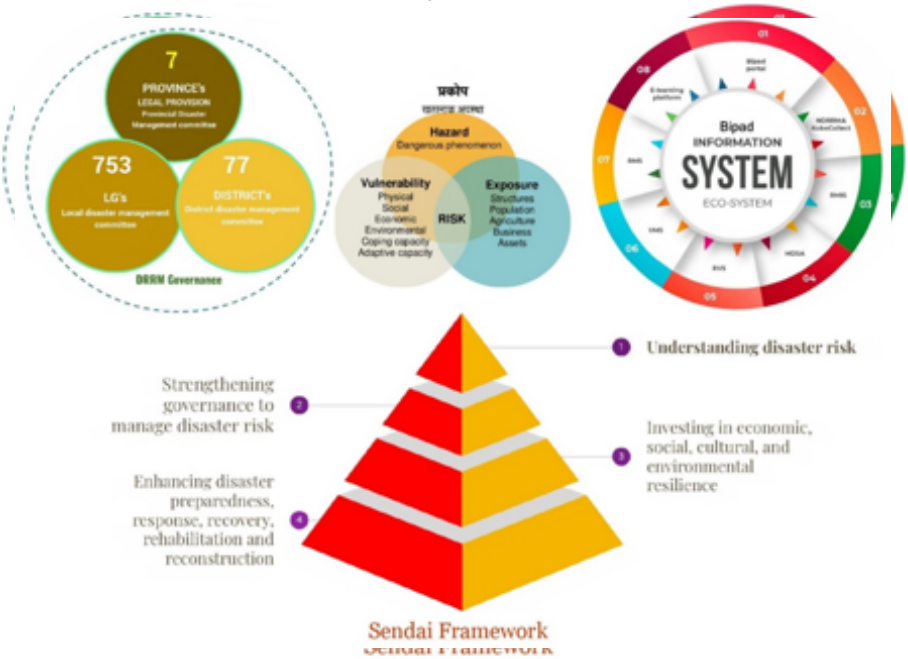
The primary role of this authority is to operationalize DRRM functions, making necessary arrangements for regular coordination with stakeholders, to carry out response operations, search and rescue, relief, early recovery, recovery plans, and implement disaster-related programs. This authority is also responsible for regulating risk reduction activities and will have an incident commander in case of emergencies.

The NDRRMA is mandated to lead, facilitate and support federal, provincial and local governments on disaster risk reduction, response and reconstruction. Guided by the DRR National Strategic Plan of Action, NDRRMA has been actively engaged in building provincial and local government capacity on the continuum of hazards, exposure, vulnerability, and disaster risks, and to provide a thorough understanding of their DRM roles and responsibilities (Fig. 3). The authority has been providing technical support on risk sensitive land use planning, hazard modelling, exposure data, vulnerability, and on conducting field investigations of settlements affected by disasters. NDRRMA also publishes regular situation reports and bulletins on monsoon-induced disasters with comparative analysis of casualties caused by such disasters.

4.4.7 SFDRR implementation

The Sendai Framework for DRR (SFDRR), Agenda for Humanity, and the UN SDGs all commit to reaching the most vulnerable people and work on the needs of

Figure 3: An overview of NDRRMA's strategic priorities



diverse and vulnerable groups in disaster situations. Nepal has been taking collective action to prevent new risks and to reduce existing risks. This is accomplished through the implementation of integrated and inclusive economic, structural, legal, environmental, technological, and institutional measures. Such concerted effort is instrumental to reducing hazard exposure and vulnerability to disaster, increasing preparedness for response and recovery, and thus strengthening the resilience of the country.

From 2018—2024, progress was made in terms of formulating policies, strategies, and legal frameworks, including capacity building of local governments. MoHA has been regularly updating DRR and Bipad portals for disaster information management systems (DIMS). Emphasis has been given to collect and archive published documents and information in DIMS from DRR stakeholders. To ensure DRRM institutionalization, a mechanism is in place to develop coherent DRRM policies and practices alongside the localization of SFDRR. MoHA has completed a mid-term review and evaluation of SFDRR by establishing a Steering Committee and Technical Working Committee.

4.4.8 DRRM at the provincial level

At the provincial level, there is a provision in the DRRM Act for Province DRRM Councils and Province Disaster Management Committees. The Ministry for Internal Affairs and Law is mandated to function as the nodal ministry for DRRM at the provincial level. The provincial DRRM Council is chaired by the Chief Minister of the province with representation from leader from the opposition party, Vice Chair of the Provincial Planning Commission, chief secretary, chief of armed forces and executive officer as the member secretary. The council is mandated to lay down policy and plan on disaster management, provide policy guidance, and direct the Provincial Disaster Management Committee as and when required.

As guided by the DRRM Act, a Provincial Disaster Management Executive Committee (PDMEC) was established, which is chaired by the province minister for Internal Affairs and Law. The committee and its members are comprised of related government agencies and security agencies (law and order, emergency response and development institutions) along with voluntary organizations, such as the Red Cross Society. It is responsible for formulating plans and policies for the province within the umbrella of the national policies and laws, implemented in coordination with the DDMC and LDMC.

4.4.9 DRRM at the district level

There is a provision of District Disaster Management Committee (DDMC) under the chair of the Chief District Officer (CDO) who represents federal government and is mandated to coordinate with respective provincial and local governments. All 77

DDMCs are operational and are responsible for district-level disaster preparedness and response planning and implementation. They are also responsible for activities related to the DRR cycle, including SAR and immediate relief. The CDO chairs the DDMC, as the highest-level government official to make disaster-related decisions at the district level. This committee is comprised of municipal mayors, line agencies, emergency response actors (i.e., Nepal Police and Armed Police Force), district chapter of NRCS, and critical facilities such as irrigation, road, livestock, health, etc.

One of six indicators of CDOs' performance contracts empowers CDOs with overall authority to preparedness for response and to manage search and rescue management at the district level. CDOs' performance evaluations are based on improvements made in service delivery of district disaster preparedness and response plans, the mobilization of quick response teams, operationalization of DEOCs, search and rescue, relief distribution, coordination meetings, and facilitation, among others. Non-government actors are also part of the provincial disaster governance and are at the frontline in disaster risk reduction. They are promoting stronger community participation in reducing disaster risk where local communities can oversee community disaster preparedness and resilience building.

4.4.10 DRRM at the local level

The Local Disaster Management Committee (LDMC) is comprised of a maximum of 15 members at each local level. This committee is headed by the mayor or chair of the local entity and its composition is guided by the local law. This committee is responsible for DRRM at the local level, such as risk mapping, resettlements, disbursement of funds during and after emergencies, SAR, and identification and transportation of the injured to hospitals. This committee is guided by the DRRM Act and Local Government Operation Act. The local authority has the right to exercise DRR, mitigation, response, relief and recovery activities.

All 753 local governments—urban and rural municipalities—are mandated to take both sole and concurrent responsibilities for DRRM within their jurisdiction. Local governments have formed LDMCs, established LEOCs and allocated emergency funds. Local governments are operating on the front lines of disaster, dealing with localized hazards as well as less-frequent large-scale events. They also bear significant responsibility to implement DRM plans and policies. In some respects, local governments are well placed to play these roles because they have firsthand knowledge of and experience with disaster risk in the communities they serve. Local governments have also integrated disaster risk concerns into spatial and development planning. However, given the rugged topography and inaccessibility, local governments in hazard-prone areas are faced with resource and capacity limitations, and are less equipped to undertake detailed risk assessments, preparedness and response measures.

Although local governments have built institutional structures to effectively implement DRRM activities, they often lack adequate equipment and trained human resources to undertake DRRM. Growing exposure and vulnerability to climate-induced hazards (especially new ones, such as the tornado in Bara and Parsa in 2019) increases the need for strengthened capacity. The existing local government's DRRM capacity is insufficient to handle these emerging threats, suggesting the need for a more comprehensive DRR and resilience approach.

4.5 Capacity development, monitoring, collaboration and partnership for disaster risk governance

Nepal aims to reduce disaster related deaths, injuries, affected families and increase resilience from local to national level by strengthening DRRM across the levels and sectors of the government, communities and private sectors through boosting resilience of whole of society. Nepal is currently focusing on the capacity building of province and local level governments on DRRM that include technical, formulation of relevant policy and legal documents and mainstreaming and integrating DRRM in development plans and programmes. Innovative approaches like the e-learning platforms have been being promoted. Some specific training and capacity building activities include disaster risk assessment, training of rescue divers, drills and simulation training to District Emergency Operation Centers (DEOCs), impact-based multi-hazard early warning system. By the end of 2023, all 753 local governments have completed DRRM training via MoFAGA.

National capacities on DRRM need to adhere to the international standards. For example, the United Nations accredits Search and Rescue (SAR) skills that meet its standards. For such skills, the government has collaborated with international partners such as INSARAG (International Network for Search and Rescue Group). However, DRRM research and training programmes are the areas that need strengthening for effective delivery of DRRM objectives as envisioned by the DRRM policies and strategies.

The government seeks to strengthen networks and partnerships for efficient DRRM towards a "no-lives-lost" approach. To enhance preparedness for effective response and recovery, clustered approach was institutionalized with UN agencies and the International Federation of Red Cross and Red Crescent Societies (IFRC) co-leading relevant DRRM cluster activities with concerned ministries. At the national level, there are two coordination mechanisms: the Cluster System and the Humanitarian Country Team (HCT). The Cluster System is led by respective line ministries and co-led by relevant development partner(s). The National Disaster Response Framework (NDRF) created 10 humanitarian clusters, including health, WASH, emergency shelter, food security, nutrition, camp coordination and camp management, protection, early recovery, education, logistics, and emergency communication.

The DRRM Executive Committee is another platform designed to ensure collaborative actions among federal agencies. The committee creates synergies between federal agencies and produces harmonized support to provincial and local levels. NDRRMA coordinates its DRRM mandate across federal departments and between all levels of government, including government agencies, civil society, and the private sector. The institutionalized delineation of DRRM roles, responsibilities, and accountability must consider sharing of institutional capacity among all three tiers of government while holding all government authorities fully accountable, to ensure these efforts galvanize the DRRM agenda.

The government has been undertaking several capacity building initiatives to strengthen the capacity of both communities and stakeholders, including the following:

- Technology and equipment for risk mapping, monitoring, early warning and disaster response;
- Building local government capacity to DRRM;
- Strengthening national DRRM Database;
- Mainstreaming DRRM curriculum in schools;
- Mock-drills and simulation exercises for different hazard induced disaster response
- Development of Search and Rescue (SAR) team with equipment as per INSARAG standards;
- Fire brigade with advanced technology, including robotic fire fighting;
- National emergency logistic capacity – infrastructure, technology, equipment and human resource;
- Humanitarian clusters to disaster response and recovery; and
- Strengthening indicator-based disaster resilience measurement tools such as Flood Resilience Measurement for Communities (FRMC)

NDRRMA carried out its first annual monitoring of the implementation of the Disaster Risk Reduction National Strategy Plan of Action (2018—2030). The purpose of monitoring was to assess the status of the action plan implementation and identify necessary corrective actions for improvement to achieve the overall targets of the DRRNSPA. The DRRNSPA is the primary tool to promote and implement DRR activities at all levels and thus periodic review and progress monitoring of the action plan is key to achieve the strategic priority actions for DRR.

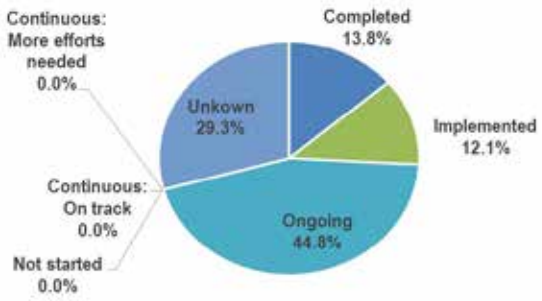
The overall progress status of the implementation of strategic activities outlined in Priority Area 2: Strengthening Disaster Risk Governance at federal, provincial and local levels has been rated higher than average in this priority area. The implementation status indicates completion of 13.8% activities with 44.8% ongoing activities (Fig. 4).

4.6 Ensuring inclusiveness in disaster risk reduction

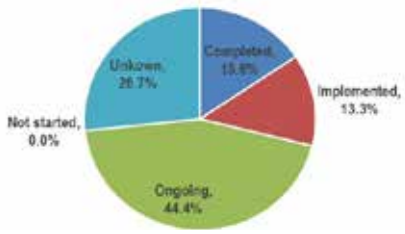
The government has prioritized strategic actions to ensure inclusiveness in DRRM such as implementing gender sensitive and inclusive approach in all the processes of DRM, establish and institutionalize disaster risk concerns to promote their empowerment and partnership by increasing participation of the most affected, less resilient and highly vulnerable

Figure 4: Breakdown of activity status of Priority Area 2

Priority Area 2: Strengthening Disaster Risk Governance at Federal, Provincial and Local Level



All activities



Short-term activities

groups in disaster risk governance activities, preparing gender equity and inclusion action plan for DRM, social mobilization programmes at the local level for accessibility, representation and participation in DRM plan formulation process.

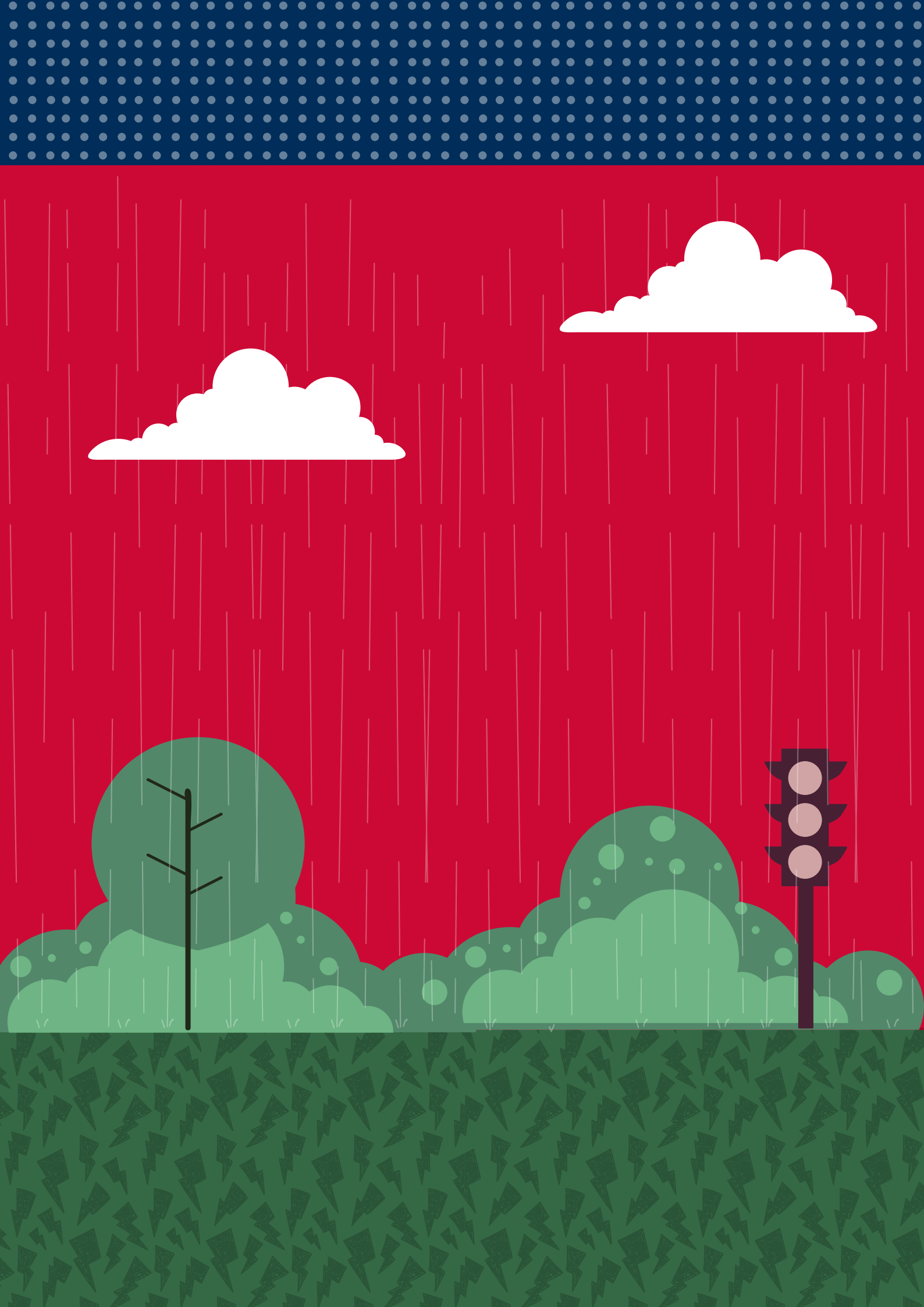
Nepal has implemented gender-responsive budgeting. It prioritizes disaster management

and social protection mechanisms for eco-friendly and building disaster-resistant infrastructures through special emphasis on renewable energy, urban planning and transportation. The existing policy and legal provisions have an overarching goal of integrating issues of disaster risk reduction and management with a special focus on gender equality and social inclusion through people-centred preventative approach to promote gender equitable and universally accessible response, recovery, rehabilitation and reconstruction for "Build Back Better".

Whole-of-society participation is at heart of the disaster governance in Nepal. It embodies engagement and partnership; empowerment of local communities in DRR; inclusive, accessible and non-discriminatory participation of vulnerable groups in decision making and DRR actions; access to resources and capacity development opportunities; access to early warning information; and empowerment for leadership role. Moving beyond humanitarian response, women are leading activities in multi-hazard early warning systems and risk-informed development and participating in anticipatory actions to proactively reduce risks. As they are advocates and communicators of DRR and climate action, women's leadership and participation at the local level is contributing to stronger and more resilient communities.

Realizing the importance of prioritizing vulnerable groups and addressing their sensitivity and needs in DRRM, mainstream gender equality and social inclusion in behavioral and mindset change, ensure non-discriminatory participation and increase meaningful participation and access, the government has been implementing Strategic Action Plan for Gender Equality, Disability and Social Inclusion (GEDSI) with a long-term vision to secure a disaster resilient country and increase access and capacity of vulnerable groups and ensure their meaningful participation in DRRM. The core objective of the plan is to mainstream vulnerable groups in planning, implementation, monitoring and evaluation of the three tiers of the government by increasing their access, representation, capacity and meaningful participation in all dimensions of DRRM through the "whole-of-society" approach.

Nepal has demonstrated more commitment to increase women's involvement and/or leadership in the formulation, implementation and integration of disability inclusion in plans and policies. In contributing to investing in disaster risk reduction for resilience, the GEDSI strategic action plan has prioritized supporting women's resilient livelihoods as well as social protection and services. The most common approach followed in the reconstruction of houses damaged by earthquakes and other disasters is the inclusion of gender and persons with disabilities issues for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.



CHAPTER 5 PROMOTING RISK-INFORMED INVESTMENTS IN BUILDING RESILIENCE

5.1 Securing investment in building resilience

TThe DRR National Strategic Action Plan (2018—2030) has identified investing in disaster risk reduction as one of its priority actions. In response, the government has intensified its work in accessing more financing for prevention, while at the same time, helping the public and private sectors to de-risk investments and reorient financial flows for increased resilience. In this regard, the government has identified gaps in public spending by tracking DRR related expenditures, conducted risk-sensitive budget reviews and facilitated in increasing transparency and data on private sector DRR actions in their decision-making process. However, gaps exist in developing new and innovative financing models for DRR investments such as blended finance instruments, resilience bonds and leveraging the full potential of the insurance sector.

The government has undertaken all possible measures to develop a resilient society through its affirmation to invest in Green, Resilient and Inclusive Development (GIRD) priorities. The country has reiterated its shared view of securing prosperity, growth, jobs, livelihoods and risk reduction, while simultaneously addressing the multiple crises that complicate Nepal's development aspirations, including climate and other environmental risks such as floods, landslides, fire, earthquake and other hazards as well as human health and welfare.

The Government of Nepal and international development partners have signed a joint communique in November 2023 and endorsed 10 key transitions which includes current and new high priority investments over the next 10 years, emphasizing integrated approaches to scale up transformational solutions that deliver sustainability, resilience, and inclusion, while building on Nepal's successes and resilience capacity. These transitions include managing landscapes to optimize benefits from water-agriculture-forest nexus; DRMM, preparedness and social protection; resilient roads and sustainable transport; renewable energy. Smart cities, resilient water supply and sanitation and leveraging human capital by equipping health system for preparedness, prevention and response.

5.2 Public-private investment in disaster risk reduction

Extreme weather events have had significant implications in Nepal's economy, and the risk is projected to increase in future. Investing in disaster risk reduction is a precondition for sustainable development in a rapidly changing climate. The private sector has a crucial role to play in financing and directing investment towards projects and companies that properly manage risks and avoid the creation of new risks in society. The Government of Nepal is engaging with the private sector on several initiatives to catalyze investments in resilience building by promoting public-private partnerships to attract participation and investments from the private sector in disaster risk insurance and risk sharing programs, which is included in the medium-term plan of national strategic action plan.

The corporate social responsibility (CSR) policies of Nepal's private sector, namely, the Federation of Nepalese Chambers of Commerce and Industries (FNCCI), Confederation of Nepalese Industries (CNI), and other reputable businesses have played a pivotal role in supporting and building knowledge, capacity, and skills through various disaster management activities. Nepal's private sector has also been preparing and implementing business continuity management practices and plans to counter risks by raising customer awareness on preparedness.

Private sector has made contributions by raising funds for relief and rescue operations through their associations. Public and private sectors have contributed to constructing unified model villages, schools, and hospitals. Long-term collaboration between DHM with telecom service providers, such as Nepal Telecom and

Ncell, for mass SMS flood alerts has been instrumental in influencing wider private sector actors to invest in DRRM as a part of their corporate social responsibilities.

5.3 Localization of DRRM initiatives

Disaster management principally starts at the level of the local government owing to the decentralized system embedded in the Local Government Operation Act. Nepal has adopted inclusive and bottom-up approach in disaster risk reduction, preparedness and reconstruction through policy, structures and capacity building measures. Nepal's constitution has mandated local governments with the sole DRRM authority as well as shared roles and responsibilities between federal, provincial and local levels. Disaster management initiatives have promoted the participation of vulnerable groups, including children, person with disabilities, elderly and women for the identification of disaster risk reduction measures, crucial and important element to make community resilient. These groups, especially children, young people, persons with disabilities and women play as agent of change to make community better prepare and address disaster and climate risk.

MoHA has initiated a policy process to unpack DRRM localization provisions and bring clarity in the delineation of roles, responsibilities and accountabilities between three levels of the government along with inter-agency coordination for disaster risk reduction, response and reconstruction. Similarly, while the National Planning Commission (NPC) has issued guidelines to integrate DRRM into local governments annual development plans, MoFAGA has prepared Local DRR Strategic Action Planning Guidelines (2021) to localize SFDRR at the local level.

The most crucial part of decentralization in disaster management is a system for responding to disasters at the local level, as disaster management is primarily a bottom-up process. During a disaster, the local government and community act quickly to manage response. However, first responders at the local level often lack the resources needed to prepare for and manage disaster response. Security agencies are key responders in disasters.

The government has been working with UN organizations, INGOs, NGOs, DP-Net and individual experts to help local governments to rapidly take up their roles and mandates provided by the Constitution and Local Government Operations Act (2017). MoFAGA has been supporting the local governments with model policy documents. Local governments have utilized these models as an example to prepare their own policies. As the result:

- All 753 local governments have their own local laws and policies on DRRM.
- All local governments have been operating Disaster Management Fund for disaster preparedness, response, reconstruction and resettlement. Estimated total fund mobilized by the local governments altogether is about US$ 16 million. During the time of COVID-19, the local government effectively utilized these funds to overcome the pandemic.
- Local EOCs have been operated by over 400 local governments.
- 419 local governments have prepared Local Disaster and Climate Resilience Plans.
- The Humanitarian Cluster Approach is also in the process of localization through appropriate guidelines and institutional structures.

Besides, MoFAGA has facilitated organizing nationwide DRRM orientation programmes for the local government employees, political leaders and stakeholders of all 753 local governments. Governments, civil society actors, including private sectors and international organizations have worked together who represent in the planning and execution through formal committees, humanitarian clusters and various task groups. Country-wide outreach and collaboration with a wide range of stakeholders has made DRRM localization training programme a unique initiative.

The principal objective of DRRM localization training was to enhance the understanding of elected representatives and officials of the local governments and build their capacities to contribute to the development, drafting and/or revision of local DRRM Acts and/or strategic plans responsive to the local context. Documentation of the overarching experience of and lessons learned from this initiative has a strong potential to educate and support state and non-state actors working in DRRM. Emphasis has been placed on showcasing how local and indigenous knowledge in disaster risk reduction and

management planning can improve outcomes and build inclusive resilience.

In fact, DRRM localization has created a firm foundation of DRRM at the local level in Nepal. The desire and aspiration of local governments to do better with their responsibilities in DRRM has increased. As a result, many new initiatives have begun, and the challenge is to give continuity to capitalize the improved interest and capacity of local governments and therefore support in implementing their action plans leading to making local development risk-sensitive and disaster-friendly.

5.4 Increasing disaster resilience through disaster risk financing, risk transfer, insurance and social security

5.4.1 Financing disaster risk reduction

Nepal has identified four overarching goals for disaster risk financing strategy. It articulates a clear goal of a "safe and resilient Nepal from disaster risk". These goals include (i) maintain a sound fiscal balance at the national level; (ii) reduce disaster impacts on critical public services, economic activity and livelihoods; (iii) ensure pre-arranged financing mechanisms are in place at national, provincial and local levels; and (iv) protect the poorest and vulnerable people from falling into a cycle of poverty due to disasters and shield the near-poor from slipping back into poverty.

Disaster has posed considerable challenges not only to livelihoods but also to Nepal's economy. Financial protection from disasters, i.e., disaster risk financing, has increasingly been applied in recent years in Nepal. However, the application of ex ante disaster risk financing is very scarce because of increasing frequency and intensity of disasters in Nepal. The Government of Nepal has spent NPR 50 billion (USD 0.4 billion) between 2012 and 2020 in disaster response and recovery.[1] The expenditure data indicates that this is not financially sustainable in the long run, which demands the development of risk transfer solutions.

The National Policy for DRR (2018) aims at allocating a certain percentage of annual budgets of federal, provincial, and local governments towards DRRM. It also lays the foundation for establishing disaster management funds at all three tiers of government. The federal government is operating a Disaster Management Fund generally deployed for disaster response and relief activities and is planning to develop guidelines to make the best use of this fund for disaster preparedness, risk reduction and recovery activities.

The government has made provisions to create a budget line for DRRM to manage financial resources necessary

1 https://www.undp.org/nepal/press-releases/undp-nepal-launches-insurance-and-risk-financing-initiative#:~:text=The%20Government%20of%20Nepal%20has,development%20of%20risk%20transfer%20solutions.

for minimization of disaster damage, enhancement of post-disaster resilience of persons, society and nation and realization of the concept of "Build Back Better and Stronger." The 16th Periodic Plan directs the investment of revenue from natural resources and increases public, private and community investments in DRRM. The government has been implementing the National Strategy for the Management of Disaster Risk Financing (2021) that aims at mobilizing funds for overall DRRM through the identification of 15 strategic actions.

Nepal has allocated significant annual budget in social security for the most vulnerable people, including elderly citizens, elderly single women, Dalit children below five years old, people with disabilities, and marginalized and indigenous communities. Attempts have been made to expand the scope of social security benefits to address the DRRM needs of target beneficiaries.

Nepal envisions achieving socio-economic prosperity by building a climate-resilient society and implementing the DRR National Strategic Plan of Action (2018–2030) by increasing risk information based private and public financing to enhance entrepreneurship and promote disaster resilience through risk sharing, insurance and other instruments amongst its various priorities. The country has prepared the National Framework on Climate Induced Loss and Damage in 2021, which provides a broader context and understanding of the relevant approaches, methodology and tools to assess the unavoidable, avoidable, and avoided risks of climate change impacts. Besides, this framework guides to devise country-driven, participatory, and inclusive approaches to tackle climate change risk and vulnerability.

The Sendai Framework for DRR and the Paris Agreement on Climate Change have mentioned building disaster resilient society by adopting financial mechanisms and increasing investment for disaster management. The Second Nationally Determined Contribution (NDC) report guides preparation of a Loss and Damage (L&D) national strategy and action plan by 2025 and establishes a country-wide multi-hazard monitoring and early warning system by 2030. The NDC Implementation Plan contains a set of reinforced mitigation actions and targets through ecosystem-based adaptation.

Nepal's Second NDC to the Climate Paris Agreement has set quantifiable targets to adapt to climate change extremes across all sectors, including an aim to achieve net-zero emissions by 2050. While the cost of achieving Nepal's NDC conditional mitigation targets is estimated to be USD 25 billion, the cost of achieving unconditional targets is estimated to be USD 3.4 billion.[2]

The government has realized the importance of insurance and risk financing that can contribute to strengthening a comprehensive risk management approach for the betterment of the community and is working to tap into the insurance market opportunities, leaving no one behind. NDRRMA has collaborated with development partners, private sector and Nepal Insurance Authority to improve legal and regulatory environment for insurance to be better incorporated in risk management priorities and actions and address increasingly frequent and complex climate and disaster risks. It has also worked with insurance companies to identify the financial protection needs of vulnerable groups such as women, farmers and businesses and facilitate the offer of customer-centric insurance products. NDRRMA continues to push for financial resilience to further advocate and make the case for insurance as a key ingredient in managing shocks and fast-tracking recovery.

5.4.2 Risk transfer mechanism

Disaster risk financing and insurance has become a key financial tool to cover and protect against disaster impacts in Nepal. The country has introduced and adopted risk transfer models and insurance mechanisms for risk financing. More than three dozen micro-insurance policies exist in the agriculture, livestock and health sectors, among others, to cover losses from disasters. Nepal responded to COVID-19 by introducing insurance policy schemes. Resources from the private sector were mobilized to increase public-private financing for DRRM.

The government has been working and supporting rescue and rehabilitation efforts for vulnerable communities, but the reliance on ex-post financing of emergency response, rehabilitation, and reconstruction from the public budget is insufficient. Realizing that financing DRR is more effective than financing post-disaster

2 https://policy.asiapacificenergy.org/sites/default/files/Second%20Nationally%20Determined%20Contribution%20%28NDC%29%202020.pdf

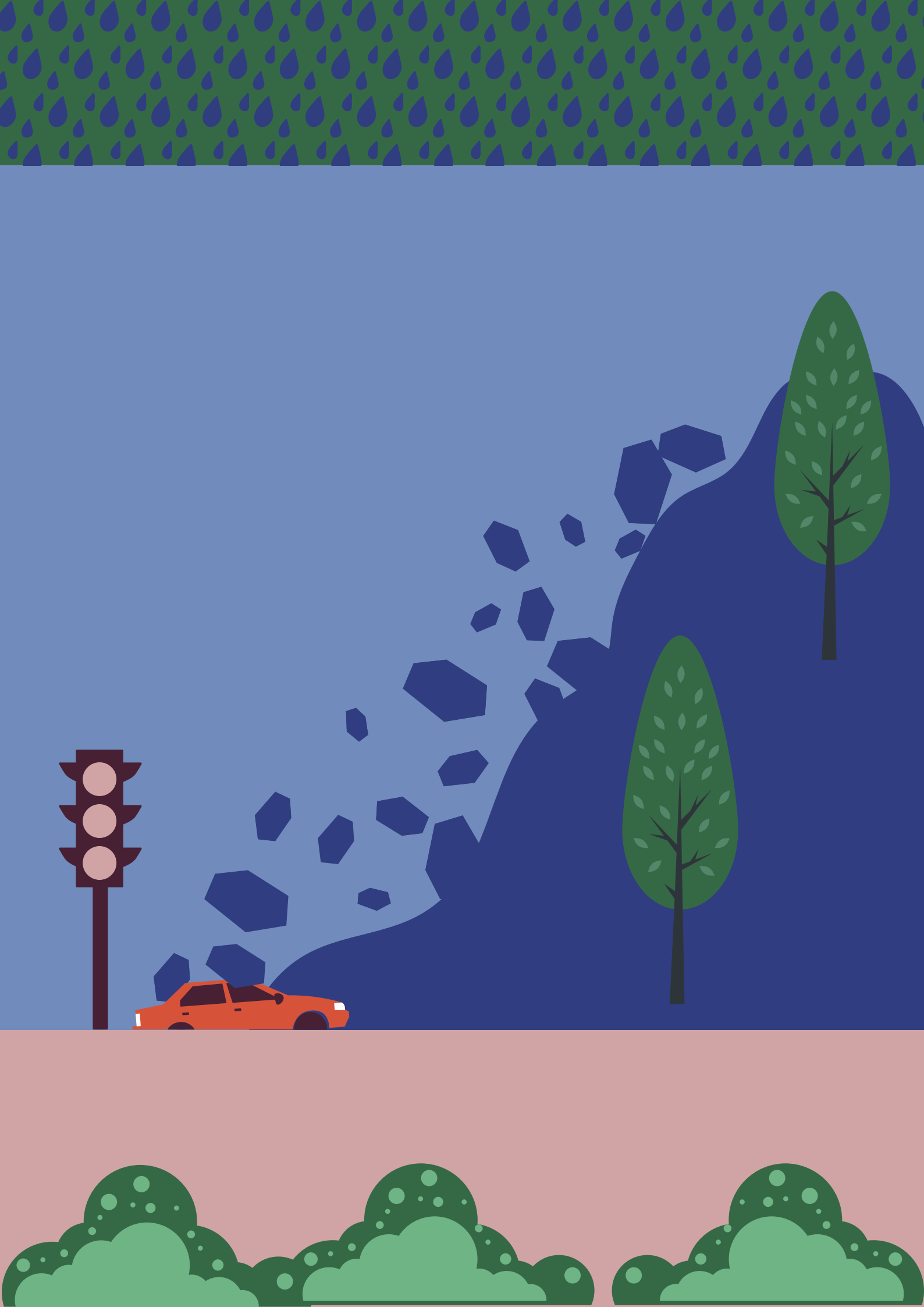
relief, rehabilitation, reconstruction, and recovery, the government has implemented National Disaster Risk Financing Strategy (2021) to minimize damage to individual, private and public assets from disasters, and to identify and implement appropriate mechanisms for risk transfer, including insurance. Crop and livestock insurance programs were introduced to provide relief for damage to crops (as well as livestock losses or damage) due to disasters, such as severe landslides.

Several funds are in place to help recover damage caused by disasters as soon as possible after they hit. These include the Prime Minister's Disaster Relief Fund, Central Disaster Management Fund, Provincial Disaster Management Fund, District Disaster Management Fund, and Local Disaster Management Fund. The respective EOCs provide immediate relief and financial support. Insurance companies have introduced integrated property insurance and micro-insurance programs, in line with legal guidance determined by the regulatory body, Nepal Insurance Authority.

Insurance companies have introduced an integrated property insurance programme and micro-insurance programme in line with the legal basis determined by the regulatory Insurance Board. The Karnali Province Government has launched Natural Disaster Risk group insurance programme with NPR 200,000 as its limit that has benefitted around 1.7 million people. The "Disaster Risk Against Group Casualty Insurance Program Operation Procedure, 2080" aims to provide relief for human losses resulting from natural disasters for the permanent residents of Karnali Province. Similarly, infrastructure security insurance programme has been initiated for the area of large physical infrastructures and hydropower projects to get them insured during the construction phase.

A case in point is the Upper Trishuli-1 hydropower project that demonstrates the value of an innovative parametric risk transfer solution that can be replicated to enable project financing in geographies exposed to natural catastrophe risks. However, disaster risk financing is a relatively a new concept in Nepal and it calls for strengthened capacity to respond after disasters hit and to provide fiscal protection through effective implementation of a risk financing strategy.

Currently, a vast majority of population, especially in rural and mountainous areas, is left outside the insurance coverage in Nepal due to lack of awareness. However, there have been recent developments to improve access among poor and vulnerable communities to financing tools that promote resilience and reduce economic losses due to disasters. Several leading insurance companies such as Shikhar Insurance and Premier Insurance have initiated climate change and disaster related risk measurement mechanism and implemented small scale livestock micro-insurance programmes to protect their investment loans for dairy cattle and livestock producers. Typically, the insurance provides all risk mortality cover during the 2–3-year loan repayment period, and the sum insured is fixed in accordance with the loan amount.



CHAPTER 6 DISASTER PREPAREDNESS, RESPONSE, RECOVERY AND RECONSTRUCTION

6.1. Emergency preparedness, response and crisis assessment

Over the past two decades, Nepal has made significant progress in disaster risk management. Several key milestones have been achieved in emergency preparedness and response. These include the approval of the District Disaster Preparedness and Response Plan Guidelines (2011), development of disaster preparedness and response plans for all districts in Nepal, and the endorsement of the National Disaster Response Framework (NDRF) in 2013. Additionally, the government has endorsed the Initial Rapid Assessment (IRA) guideline, complemented by the Multi-Cluster Initial Rapid Assessment (MIRA) guideline. NDRRMA has also developed landslide investigation tools for use by local and national technical expert teams.

The NDRF outlines the roles, responsibilities, and key activities of all three tiers of government, as well as non-governmental organizations, in disaster preparedness and response. It also acknowledges the contributions of United Nations agencies and bilateral partners, particularly the USA, India, China, the UK, and Bangladesh. International standard protocols such as INSARAG and the Cluster System are incorporated as well. Consistent with the NDRF, Standard Operating Procedures (SOPs) for the Emergency Operations Center (EOC) network in Nepal delineate the chain of command, communication procedures, and actions for different agencies.

In terms of crisis management, many of the crisis risks Nepal faces directly affect livelihoods, but existing social-protection systems are not set up to facilitate livelihood recovery. The Crisis Preparedness Gap Analysis Report prepared by the World Bank in February 2024, states that while Nepal can manage small, localized crises, it is not prepared for large, multisector crises, adding that an adequate legal and policy framework exists for crisis preparedness, but the country is still in its early days of institutionalization.

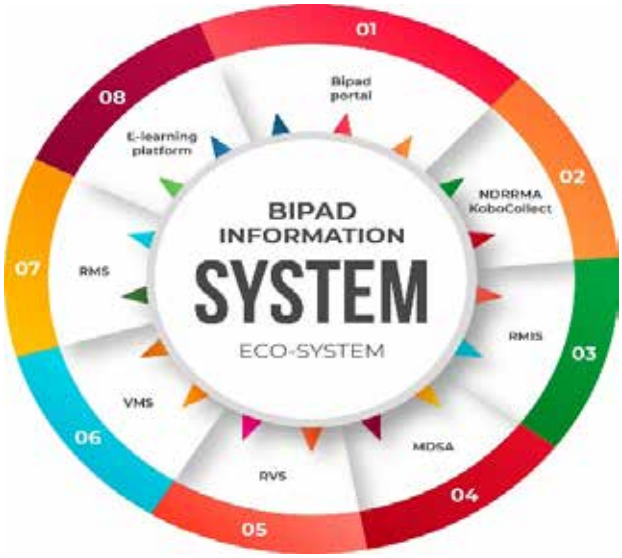
In the area of health hazards, just before the onset of the COVID-19 pandemic, the National Pandemic Preparedness and Response Plan was approved by the Ministry of Health and Population in 2020. The Standard Operating Procedure (SOP) for the Health Emergency Operations Center (HEOC) was endorsed in September 2015 and amended in 2018, a year after the HEOC was established. In the federal context, the Health Emergency and Disaster Management Unit (HEDMU) of the Ministry of Health and Population (MoHP) has been tasked with developing strategic and technical documents to guide federal and provincial health entities in managing public health emergencies. It serves as the Secretariat of the MoHP Incident Command System (ICS) during health emergencies and disasters and works closely with the Department of Health Services, Provincial Ministry of Social Development, Health Directorates and NEOC.

The DRR Portal (http://drrportal.gov.np/) serves as the main Disaster Risk Management portal under the jurisdiction of the Ministry of Home Affairs (MoHA). It contains DRM-related documents, including policies, acts, regulations, guidelines, and data. Another key platform, BIPAD (https://bipad.gov.np/np/), which means 'disaster' in Nepali, is currently undergoing localization. Currently, Bipad serves as the national information platform for disaster management. There are opportunities to further enhance its accessibility and user-friendliness for all users. Simplifying the interface and improving ease of access to data and maps will empower sub-national users, including those in Provincial, District and Local Emergency Operations Centers (PEOCs, DEOCs, and LEOCs), to fully utilize the system's capabilities.

However, gaps remain that require urgent attention, particularly in the localization of the National Bipad Information Management System. While NDRRMA has established an integrated national-level central information system, other tools like the Vulnerability Mapping System (VMS), Godam, Risk and Vulnerability Surveillance (RVS), and Risk Mapping Information System (RMIS) are contributing to the national information management system. There is a significant opportunity

to localize these tools at the local and community levels to strengthen local capacity in risk mapping, analysis, and tracking in online systems.

Disaster Risk Reduction and Management Information Systems includes:



- Bipad Portal
- Bipad information Collect
- RMIS: Reconstruction Management Information System
- MDSA: Monitor for Disaster Strategic Plan of Action
- RVS: Rapid Visual Screening
- National Volunteer Bureau Formation and Operation System - Volunteer Management System (VMS)
- Godam System
- E-Learning Platform

Efforts have also been directed towards building the capacity of local stakeholders to effectively use these systems and policies during their annual planning and budgeting processes. Recognizing that communities are on the front lines of disaster response, NDRRMA, along with provincial and local governments and development partners, has invested in awareness-raising efforts on emergency preparedness and response (EPR) through print, digital, and social media. These efforts have often been project-based, but the government has successfully engaged media outlets (television, radio and newspapers) in a nationwide disaster awareness campaign. NDRRMA has conducted emergency preparedness and response assessment of the existing emergency preparedness and response capacity of Nepal using the R2R methodology.

6.1.1 R2R Diagnostic Tool

Each component includes a set of criteria that address a particular aspect of a functional EP&R system for a jurisdiction. In turn, each criterion includes a set of four indicators, each with five key attributes that gauge the maturity of that aspect of the preparedness and response system. In total, the diagnostic examines 360 individual data points related to the strength of the EP&R system.

The Ready2Respond Rapid Diagnostic uses an attribute-based scoring system for every indicator. This allows

Figure 1: Emergency Preparedness and Response System Core Components of R2R Diagnostic

results to be quantified and verified, key considerations for informing investments. Further, this approach ensures that results are replicable by largely removing subjectivity and qualitative assessment from the diagnostic approach. The Ready2Respond Rapid Diagnostic avoids fidelity to any particular emergency management standard (e.g., NFPA, EMAP, CSA, ISO), communication standard (e.g., CAP, 700mHz), incident organization structures (e.g., NIMS, ICS), etc. Rather, rapid diagnostic focuses the scope entirely to the typical operational needs and creates room for the application of these standards in jurisdictional program design. This approach ensures that a market advantage is not created for any standard and that EP&R solutions can be tailored to the needs and context of the jurisdiction, rather than requiring the jurisdiction to conform to a standard at the outset of the discussion. The R2R diagnostics methodology is one of the first in South Asia to be implemented by NDRRMA.

Total Score		
2 years	5 years	8 years
Need: USD 191.2 M		

Graph description: Nepal's EP&R scores vary greatly depending on the criteria and indicators used. Although

legislative accountability is reasonably high, this number may not fully reflect reality. All four components—information, facilities, equipment, and personnel— have obtained low scores and need to be improved gradually. The system can handle modest response needs daily, but it lacks the operational framework for a coordinated and effective, interagency response for medium to large-scale disasters. For example, during the April 2015 earthquake, the incident command system was insufficient to oversee search and rescue activities.

Component 1: Legal and Institutional Accountability scored the highest with 2.49 out of 5, which is 49%. This illustrates that Nepal does have policies, frameworks, acts, regulations, guidelines, and standards related to EPR, but there are still room for improvement. One of the strengths of legal aspect of EPR in Nepal is that all three levels of government have developed a strategy framework, policies, procedures, and plans, as well as standard operating procedures, for disaster preparedness and response. Within the component, however, financial preparedness is weak because adequate budget is not allocated systematically to EPR.

Component 2: Information management is weakest component of EPR system in Nepal, with a score of 1.8, which is 36%. It demonstrates that Nepal's information management systems, community engagement in disaster management, and early warning systems are all in need of significant improvement. Although 3-5 Disaster Information Management Systems exist in Nepal, they need to be consolidated, and new MISs need to be developed, for example, for database of trained personnel and inventory of SAR equipment.

Component 3: Facilities also does not fair very well, with a score of 1.89 out of 5 which is 37.8%. Although the Government has established the EOCs throughout the country, almost none of them are operational because of lack of personnel, equipment, and IT and communication systems. They don't even have their own independent building.

Component 4: Equipment scored 1.67 out of 5, which is 33.4%. Comparing this with Component 5 Personnel (47%), it can be concluded that although there are EPR trained personnel (responders), Nepal severely lacks SAR equipment.

Component 5: Personnel received the second highest score of 2.35 out of a total of 5 points, or 47%, as shown in the table above. This means that the training system in Nepal is the most advanced among the 5 components, which makes sense because Government of Nepal and development partners have invested heavily on EPR training over the last 2 decades.

6.2 Emergency preparedness and response mechanisms

- Capacity Development activities at local level:
- Training and capacity building (including drill and simulation)
- Record of the diver training from its starting timeline. Take data reference from the Nepal Army and APF.
- Number of Fire engines and vehicle and ambulance number
- Capacity development activities on Building Code Implementation (BCI) training
- Gender violence related training
- Simulation activities
- Bipad portal training
- GEDSI training activities
- Sphere standards training
- Land use plan
- Local level emergency response operational center trainings event
- Reconstruction management information system orientation and trainings

6.2.1 HSA and Godam system

Humanitarian Staging Areas (HSAs) are an essential component of Nepal's emergency response operations. Starting with the main HSA at the Tribhuvan International Airport in Kathmandu, there are 7 HSAs, one in each province, and they have played an important role in the government's response during the COVID-19 pandemic and other emergencies. With a storage capacity of 1,535 metric tons, HSA can store humanitarian relief supplies, such as shelter materials, health, and hygiene kits, and water and sanitation equipment - enough to serve more than 60,000 people each HSA. Birgunj is the biggest port that handles more than 50% of imports in Nepal; a storage space near the airport in Birgunj has been constructed which has a storage capacity of 2,032 square metric tons. The HSAs are equipped with logistical items, such as generators, satellite phones, fuel, boats, and search and rescue tools. The staging area is located in the provincial airport to be able to collect and disperse as per need in a short time. Nepal Red Cross Society, which mainly focuses on the distribution of relief items, has altogether 12 warehouses that store relief items. There is one central level warehouse that stores 10,000 kits, four regional warehouses that store 4,000 kits, 2 Zonal warehouses that store 2,500 kits, and 5 sub-zonal warehouses that store 1,000 relief kits. The warehouses supported by WFP and Red Cross only store non-food items and do not store food.

Nepal Food Corporation (NFC) was established by the Government of Nepal in 1965 to facilitate the storage and availability of cereals and other food products in Nepal. In 2018, the Government of Nepal decided to merge the Nepal Food Corporation and Salt Trading Corporation to form the Food Management and Trading Company Ltd (FMTC), a government-owned company; the process of merger is still ongoing. Our consulting team has not been able to determine how many warehouses FMTC has and the total storage space; the team will collect this information for the final report. Similarly, private-sector-led Nepal Warehousing Company Limited has a state-of-art grain storage space for farmers that also does auction management, commodity trading services, and delivery and transport services. NDRRMA and MoHA do not have a standing agreement with FMTC or Nepal Warehousing Company to obtain and/or distribute food to the affected population during an emergency.

Godam Information System is an inventory management system developed to track and manage the storage, movement, and distribution of goods, particularly in the context of disaster response and recovery. In the Nepali language, "Godam" translates to "warehouse." This system is designed to enhance efficiency in managing humanitarian aid supplies, relief materials, and other resources that are essential during emergencies. Arrangements have been made to store materials for vulnerable communities. Rescue and relief materials have been systematically entered into the warehouse management system (Godam system) to ensure efficient tracking and distribution during emergencies. As part of Nepal's broader efforts to localize disaster management systems, the Godam Information System is being integrated at the local level. This enables local governments and community-level responders to access and manage their own inventories, thereby strengthening local capacity in disaster preparedness and response.

The National Disaster Risk Reduction and Management Authority (NDRRMA) develops a Monsoon Preparedness and Response Plan (MPRP) at the national

level every year. This plan outlines the necessary steps for preparing and responding to monsoon-related disasters across the country. In alignment with the national MPRP, relevant response agencies create their own response plans tailored to their respective areas of operation. Similarly, provincial governments and district disaster management committees develop their respective provincial or district-level plans in line with the national MPRP. Local governments, including provincial and district disaster management committees, actively participate in the planning and response process, ensuring coordinated efforts at all levels without emphasizing any specific organization.

Private sector engagement in Disaster Risk Reduction (DRR) plays a crucial role in building resilience through Business Continuity Management (BCM) and Planning (BCP). National efforts focus on increasing private sector participation in disaster preparedness by offering training, capacity building, and raising awareness of BCM's significance. These initiatives have led to key achievements, such as improved business preparedness, the development of BCM training materials, and the introduction of resilience awards that motivate companies to prioritize disaster readiness. Despite challenges like limited awareness and investment, lessons learned emphasize the importance of targeted awareness campaigns, technical support, and effective communication with the private sector.

Long-term sustainability efforts include collaborations with academic institutions to integrate BCM into business curricula, ensuring future leaders are well-versed in disaster resilience. Success stories, such as hotels pioneering BCP implementation at the community level, demonstrate the potential impact of institutionalizing BCM practices. Additionally, innovative programs like the Private Sector Innovation Challenge (PSIC) have fostered resilience at the local level by engaging municipalities, businesses, and educational institutions. Partnerships between the private sector and disaster management initiatives continue to strengthen resilience-building efforts, while focused programs aim to empower women entrepreneurs, enhance disaster risk financing, and promote a culture of disaster preparedness across various sectors.

6.2.2 Volunteer Management System (VMS)

The national-level Volunteer Management System (VMS) has been developed and is now actively recording the details of volunteers across the country. VMS is aligned with the strategic plan, now records and monitors more than 50,000 volunteers ready for deployment during disasters. Provincial and local governments have contributed Capacity-building programs for these volunteers in collaboration with NDRRMA and development partners, ensuring that these community members are well-prepared to act as first responders.

These volunteer bureaus have become integral to disaster response efforts, with volunteer mobilization programs being included in the annual programs of provincial and local governments. With the support of development agencies, these programs have been localized to suit the specific needs of different regions, thereby enhancing their effectiveness and ensuring that the local communities are empowered to respond swiftly in times of crisis.

To date, a significant number of volunteers have been mobilized through these initiatives (data references can be drawn from VMC). Their involvement in past disasters, such as earthquakes and monsoons, has been crucial in ensuring timely and effective disaster response and relief distribution. These volunteers, often drawn from the local communities, have not only aided in immediate response efforts but have also contributed to anticipatory action and disaster risk reduction. Some exemplary work has been done by volunteers during major disasters, which highlights their importance in the disaster management ecosystem.

Furthermore, provincial governments, particularly in Koshi and Bagmati, have recognized the importance of volunteer capacity development and have allocated resources to develop and implement annual activities focused on volunteer training. These capacity development activities at the local level are designed to equip volunteers and local community members with the necessary skills to respond to disasters effectively and contribute to long-term disaster resilience.

6.2.3 EOC networks at national, provincial, district and local levels

The main agency responsible for emergency preparedness and response is the Emergency Operations Center network, which consists of the following: a) National Emergency Operations Center (NEOC) in the capital city of Kathmandu, b) Provincial Emergency Operations Center (PEOC) in the capital cities of 7 provinces, c) District Emergency Operations Center (DEOC) in 70 districts out of 77 districts (except and Kathmandu, Bhaktapur, Lalitpur, Kaski, East Rukum, Doti, and Nawalparasi East) d) Municipal Emergency Operations Center in approximately 100 municipalities.

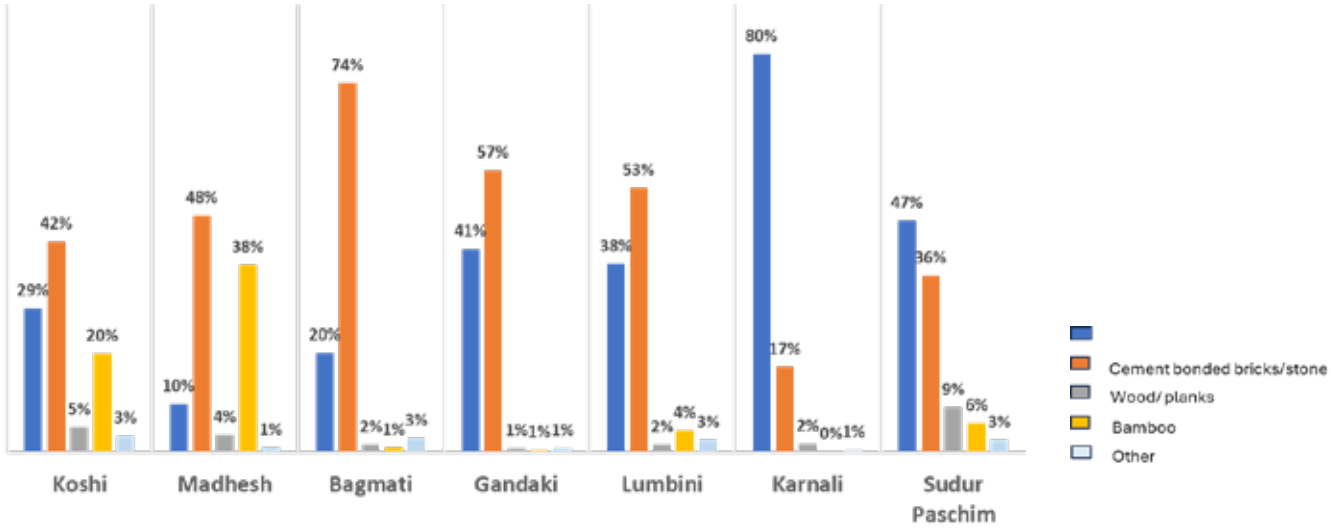
Health Emergency Operation Center (HEOC) was established in 2014 that includes both physical spaces as well as an approach for managing emergencies. HEOC plays a pivotal role in facilitating and maintaining operational linkages between health sector multi-hazard preparedness and response mechanisms and the existing and emerging institutions/mechanisms for community, province, and the central level disaster risk management initiatives in other sectors.

The integrated emergency communication system is designed to enhance communication efficiency during emergencies in Nepal. This system creates a robust network for timely and effective information dissemination and coordination among government entities and emergency services. It employs various communication channels, including emergency hotlines, radio and TV broadcasts, SMS alerts, internet platforms, and community-based communication through local centers and volunteers. These measures ensure that critical updates and alerts reach the public quickly, facilitating effective disaster response and management.

To ensure the system's effectiveness, it emphasizes coordination between agencies and centralized command, which facilitates overall coordination between security forces, the National Emergency Operations Center (NEOC), the UN Emergency Center, Provincial Emergency Operation Centers (PEOCs), District Emergency Operation Centers (DEOCs), and Local Emergency Operation Centers (LEOCs), depending on the scale of the disaster. The system is continuously monitored and evaluated to refine and enhance its operational standards. Key directives include maintaining communication infrastructure, coordinating responses among national and local authorities, and efficiently allocating resources. NDRRMA's collaboration with local and provincial governments is essential for establishing and sustaining these communication standards. Regular updates and training further strengthen preparedness and responsiveness, ensuring that the IECS remains effective in managing emergencies as they occur. All three levels of government are mandated to develop operational procedures for their respective Emergency Operations Centers (EOCs) to facilitate effective emergency response during crises. These procedures are designed to ensure coordinated action across federal, provincial, and local levels, providing clear guidelines for managing and directing emergency efforts.

Coordination of disaster response involves collaborative approach among various clusters and organizations, each focusing on specific areas of recovery and support. Key clusters include Health, Water, Sanitation and Hygiene (WASH), Emergency Shelter, Food Security, Nutrition, Camp Coordination and Camp Management (CCCM), Protection, Early Recovery, Education, Logistics, and Emergency Communication. Each cluster is managed by sectoral ministries co-led by humanitarian agencies, which handle various aspects of disaster response and recovery. The aim is to integrate efforts across different sectors, ensuring comprehensive and effective disaster management.

Nepal's disaster response strategy includes establishing a robust operational framework to manage and coordinate recovery efforts. This involves setting up base operations for cluster activities, integrating local and international resources, and ensuring effective communication and coordination among stakeholders. The response system also includes compliance mechanisms and regular assessments to address challenges and ensure accountability. NDRRMA oversees the implementation of these strategies, facilitating collaboration and leveraging resources to address both immediate and long-term recovery needs.



6.3 "Build Back Better" approach in recovery and reconstruction

The Build Back Better (BBB) concept, promoted by the National Reconstruction Authority (NRA) and the Government of Nepal following the 2015 earthquake, has made significant strides in enhancing earthquake resilience across the country.According to data from the Central Bureau of Statistics (CBS) for 2078, there has been a notable shift towards more earthquake-resistant construction methods in Nepal's urban and rural municipalities. In urban areas, 63% of households now constructed by cement-bounded bricks or stone with some engineering technologies, reflecting a substantial improvement in construction standards. Similarly, rural municipalities have seen 31% of households adopting cement-bounded brick or stone with engineering technology.This shift is largely attributed to the recovery and reconstruction programs implemented after the 2015 earthquake, which emphasized capacity building and socio-technical assistance under the BBB framework.

Despite these advancements, there are still provinces where the adoption of modern engineering technologies remains lower, highlighting areas that require focused attention. For instance, in Karnali Province, only 17% of households use cement-bounded brick or stone with engineering technology, while a significant 80% still rely on mud-bonded bricks with less engineering technology. Similarly, in Sudurpaschim Province, although 36% of households employ cement-bounded construction with engineering advancements, a considerable proportion still depend on less resilient construction methods. Future efforts should prioritize increasing awareness and implementation of engineering technologies in these underrepresented provinces to further enhance earthquake resilience and overall disaster preparedness across Nepal.

Article 37 of the Constitution of Nepal provides for the right to housing as a fundamental right of citizens; to uphold the constitutional provision for the right to housing, various levels of government (federal, provincial, and local) are implementing different housing programs to support vulnerable households and provide financial and socio-technical assistance to multi-hazard affected households. The issue of recovery, reconstruction of private houses damaged by multi hazards has become rights based.

Nepal's reconstruction and recovery efforts have rapidly evolved over the past six years, marked by significant achievements in rebuilding and restoring infrastructure through the "Build Back Better" principle.This approach, which emphasizes resilience and owner-driven methods, has led to the reconstruction of over eight hundred thousand private houses. The comprehensive recovery and reconstruction activities following the 2015 earthquake have made substantial progress across various sectors. Specifically, out of the 833,821 damaged households, 736,767 have been successfully reconstructed, representing an impressive 88.36% completion rate. In the health sector, 925 of the 1,136 damaged facilities have been rebuilt, achieving an 81.43% completion rate.

These outcomes underscore the effectiveness of the 'Build Back Better' approach in Nepal's recovery efforts,

highlighting significant strides in rebuilding private homes and critical infrastructure. Nonetheless, the slower progress in heritage site restoration indicates the need for continued focus and resources to fully address the cultural aspects of the recovery process.

Since 2077, NDRRMA has been leading a comprehensive reconstruction effort for households affected by monsoons and fires across Nepal. This initiative, supported through joint financial and technical collaboration with federal, provincial, and local authorities, has seen financial contributions distributed as follows: federal (50%), provincial (30%), and local (20%). NDRRMA has identified over 18,000 households impacted by these hazards, prompting extensive recovery and reconstruction processes. Detailed geo-hazard assessments and resettlement programs are underway in approximately 671 settlements across 29 districts, addressing the increasing risks posed by various hazards and development projects.

NDRRMA has undertaken several key initiatives to bolster local and provincial capacities for promoting a Build Back Better approach in disaster recovery. For earthquake-affected districts such as Jajarkot and Bajhang, NDRRMA has implemented a temporary shelter support program, disbursing NPR 50,000 to each affected household in two installments following the finalization of guidelines. In terms of capacity building, NDRRMA has conducted physical orientation and training sessions on the Reconstruction Management Information System (RMIS) across 52 districts and 450 municipalities, complemented by virtual orientations for 66 districts and 448 municipalities. Additionally, 1,058 surveyors have been trained in RMIS and KoboTool to enhance their data collection and analysis capabilities.

Further strengthening recovery and reconstruction efforts, NDRRMA has registered 16,768 affected households in the Bipad RMIS system to facilitate access to reconstruction and recovery grants. Detailed damage assessments have been completed for the Lamjung, Achham, and Bhojpur earthquakes, providing critical data for recovery planning. Through the National Housing and Settlement Resilience Platform (NHSRP), NDRRMA has seconded two staff members to each province under the Disaster Focal Ministry to improve local technical capacity. By establishing its presence at the sub-national level and integrating lessons learned from the 2015 Gorkha earthquake recovery, NDRRMA aims to enhance recovery and reconstruction efforts at the local, district, and provincial levels, ensuring a coordinated approach across all four governance systems in Nepal.

6.3.1 Promoting indigenous knowledge

Provisions of Article 51 (8) of the Constitution, such as including the words 'Nepali labor, skills, and raw materials. In the provisions of Clause 27 of the Disaster-Affected Private Housing Strengthening, Reconstruction, and Rehabilitation Grant Procedures 2081, it is mentioned that local resources, skills, and traditional techniques and technologies are being encouraged. Provision for making local resources available at concessional rates, and work is being carried out accordingly.

6.3.2 Urban reconstruction

While considerable progress has been made in housing recovery by the then National Reconstruction Authority (NRA) and other government entities, urban housing recovery has been slower than rural housing recovery. The issues hindering urban recovery are complex, and often interlinked. Key issues of urban recovery include access to finance; variances in land ownership and related legal implications; compliance with heritage norms; gaps in communication and flow of information; Socio-Technical Assistance elements that are not responsive to the needs of urban areas; retrofitting in urban areas; and unmet needs unique to vulnerable groups.

Out of the 373,104 households from urban municipalities who are eligible for receiving financial and technical support from NRA, 61.61% have completed their reconstruction. In rural municipalities, the success rate is higher, where 88.36% have completed their housing reconstruction. Further, data indicates that urban recovery is not uniform across the 32 earthquake-affected districts; 38% of earthquake-affected households in urban municipalities of Kathmandu Valley have completed reconstruction, compared to 71.83% of households in urban municipalities outside Kathmandu Valley. Data shows that reconstruction in urban areas is slower as compared to reconstruction in rural areas.

Green, resilient and inclusive reconstruction (exemplary reconstruction)

6.3.3 Mixed success on integrated settlement

Nepal implemented several programs to rebuild private homes and relocate communities from geologically risky areas. After 2015 earthquake, the government initiated a total of 106 integrated settlement development programs, of which 97 have been completed, resulting in a 91.51% progress rate. The integrated settlement planning aimed to physically, economically, and culturally rehabilitate affected communities, with a minimum requirement of 10 beneficiaries per settlement.

Despite these efforts, the relocation process has faced several challenges, including legal obstacles in land acquisition, insufficient budgets, and the unsuitability of new settlements for traditional livelihoods. Cultural and social factors, along with a city-centric mindset, have further complicated the success of the integrated settlement planning. Many relocated households struggle with issues such as extreme weather conditions in their new homes, lack of space for traditional agricultural practices, and insufficient infrastructure like schools, health posts, and community buildings. Addressing these challenges requires ongoing dialogues with stakeholders, prioritization of issues, and a clearer mandate for the roles of local, provincial, and federal governments in sustaining and expanding these settlement programs.

NDRRMA is providing a maximum of NPR 300,000 or as per actual relocation grant for monsoon and fire affected each household with the provision that the households do not have suitable land to construct a house. Around 671 settlements across 29 districts settlements requiring relocation or resettlement have been recorded in the government system from various municipalities across the country. After the endorsement of Multi hazard recovery and reconstruction guideline now this provision is applicable for the settlements affected by multi hazard disaster.

6.4 Green, resilient and inclusive reconstruction (exemplary reconstruction)

NDRRMA has adopted the Green, Resilient, and Inclusive Development Pathway (GRID) for housing recovery and reconstruction for households affected by hazards like monsoons and fires. This approach emphasizes owner-driven initiatives, promoting 'Build Back Better' strategies to enhance resilience and sustainability. It supports the use of local materials and vernacular architecture, encourages community participation, and favors in-situ construction to minimize internal migration in urban areas. NDRRMA also focuses on local economic development, equitable benefits for vulnerable populations, and empowering local governments. To reinforce these principles, affected households adhering to GRID principles are eligible for an additional NPR 50,000 grant. This strategy includes collaboration with various stakeholders, ensuring resilience in public and private infrastructure, providing concessional financing, and establishing robust compliance and grievance redressal mechanisms.

- Emphasizing owner-driven initiatives, ensuring that individuals have a central role in the rebuilding process.
- Adopting a 'Build Back Better' strategy to enhance the resilience and sustainability of structures.
- Promoting the use of local materials, appropriate technology, and vernacular architecture to ensure cultural relevance and environmental sustainability.
- Encouraging active community participation in decision-making and implementation.
- Favoring in-situ construction to preserve existing communities and minimize displacement.
- Focusing on local economic development and job creation to bolster community resilience.
- Adopting a pro-poor approach to ensure that vulnerable populations benefit equitably from the reconstruction efforts.
- Empowering local governments to take a leading role in the reconstruction process.
- Securing technical and financial support from provincial and federal authorities to strengthen the implementation of GRID principles.
- Fostering collaboration with international and non-governmental organizations, as well as private sectors, to leverage diverse expertise and resources.
- Ensuring the resilience of public infrastructure to withstand future shocks and disasters.
- Providing concessional financing to support the reconstruction efforts.
- Establishing a robust compliance mechanism and grievance redressal system to address concerns and ensure accountability throughout the reconstruction process.

6.5 National and international forum

Nepal has hosted national and international forums to engage diverse communities working on the Build Back Better approach for shelter and settlements recovery and reconstruction, sharing the country's learnings from the recovery process and addressing current needs and priorities, which includes the Asia Shelter Forum (ASF) and the Nepal Shelter Forum (NSF) in 2021, 2023, and 2024, to address national needs and priorities in shelter and settlements. These events were guided by the National DRM Act, Strategic Action Plan, and the objective of localizing policies and frameworks for multi-hazard resilience. Under the leadership of the National Disaster Risk Reduction and Management Authority (NDRRMA), the forums engaged a range of stakeholders to enhance disaster resilience at all government levels and within communities.

The conferences featured diverse panel sessions covering critical topics such as Gender Equality, Disability and Social Inclusion (GEDSI), Green Resilient and Inclusive Development (GRID), and the integration of Information Communication Technology (ICT) in disaster preparedness and recovery. The forums drew on lessons from the 2015 Nepal earthquake, addressing ongoing recovery needs and multi-hazard impacts, particularly in West Nepal's Karnali and Sudurpaschim provinces. Emphasis was placed on improving disaster response through policy dialogues and integrated approaches, promoting inclusive resilience, and addressing climate change impacts on housing and settlements.

6.6 Nepal's support to Pakistan flood and Turkiye earthquake

6.6.1 Turkiye earthquake

Türkiye and Nepal have experienced devastating earthquakes, causing widespread destruction and loss of lives. The earthquakes in Türkiye in February 2023 resulted in over 48,000 fatalities and immense damage to

buildings and infrastructure. The Government of Türkiye's initiative on disaster risk reduction and management has been exemplary ever since the reconstruction and risk reduction efforts since the 1999 Marmara Earthquake.

The Government of Türkiye's emergency response support to the Government of Nepal immediately after the 2015 earthquake is considered as the one of most speedy response among its friendly countries. On 6 February 2023, a 7.8M earthquake struck southern and central Türkiye that took the lives of 53,537 people. In response to it, the Government of Nepal provided support to the Government of Türkiye in the form of relief materials, including medicines, medical supplies, warm clothes and other essential items. This bilateral relationship between the two countries has strengthened, particularly in emergency response and overall disaster risk reduction and management.

6.6.2 Pakistan flood

On August 25, 2022, Pakistan declared a state of emergency in response to unprecedented flooding that was described as the worst in the country's history and one of the costliest natural disasters globally. The scale of the flooding, which was the deadliest since the 2020 South Asian floods, prompted an international humanitarian response. In this critical context, Nepal has actively contributed to Pakistan's recovery efforts by sharing valuable lessons and experiences from its own recovery process following the 2015 Gorkha earthquake.

Nepal's support was facilitated through various channels, including bilateral engagements with the Government of Pakistan, collaboration with international donor agencies link world Bank, and the adoption of recovery and reconstruction methodologies like those implemented under Nepal's National Housing and Settlement Resilience Platform (NHSRP), now mirrored in Pakistan's Sindh Housing Recovery and Reconstruction Platform (SHRRP).

Nepal's approach involved transferring expertise and best practices in recovery and reconstruction to assist Pakistan in addressing the flood's devastating impact. This support not only provided practical insights into effective disaster response and recovery but also helped strengthen bilateral relations and international cooperation in managing large-scale natural disasters. By leveraging its own recovery framework and experiences, Nepal has played a crucial role in aiding Pakistan's efforts to rebuild and restore affected communities, demonstrating solidarity and a commitment to shared global resilience in the face of natural calamities.

CHAPTER 7 LOOKING TO THE FUTURE—KEY LEARNING AND WAY FORWARD

7.1 Key learning

The following are Nepal's key learnings to deliver the overall DRRM objectives:

- In terms of disaster governance, the overall learning for Nepal is to effectively implement the DRRM Strategic Plan of Action and meet the targets within the stipulated timeframe. Despite the adoption of a significant number of policies and strategies for DRRM, achieving the targets is challenging. Provincial and local governments are a comparatively new institutional set-up and thus require continued technical and human resource support to take over DRRM responsibilities.
- Similarly, Nepal's capacity to respond to mega disasters is not to the desired standard. Nepal responded to and managed recent mega disasters, like COVID-19, floods, and landslides events, but with great effort and with support from all levels of national and international partners. Therefore, Nepal needs well trained volunteers with Search and Rescue (SAR) operation skills in addition to local leadership in post-disaster relief, response and rehabilitation – a crucial element for effective disaster management.
- Coordination challenge exists in Nepal amongst DRR institutions, both at vertical (federal–provincial–local governments) and horizontal (inter–agency) levels. NDRRMA mobilizes District Administration Offices (DAOs) and other respective provincial- and local-level offices to establish direct connections and implement DRR initiatives at provincial and local levels. NDRRMA must rely largely on other agencies to obtain risk information (e.g. hydro-meteorological hazards with DHM and information on disaster impacts from DAOs). In addition, NDRRMA does not have any mandate to provide direct guidance to local and provincial disaster management committees but can execute it to implement National Council and EC decisions.
- Based on the principles of federalism, the central government has not been able to provide adequate technical capacity and resources to address higher risks from fire disasters to municipalities. The management capacity of municipalities to handle fires is inadequate. The local government and disaster management division/section must be well capacitated to address the needs of firefighters and fire stations, with standard operating procedures to ensure appropriate response and preparedness to fire disaster. Although all security forces made special efforts to secure equipment and construct infrastructure specifically for disaster management purposes, the quantity and types of existing SAR equipment and infrastructure are inadequate.
- Financing DRRM is another learning for Nepal as the resources available to the government from its revenue are limited, and the priority to finance DRRM is always secondary to development, especially in infrastructure development programs.
- Current systematic DRRM research and education initiatives (both formal and informal) are inadequate. As an important element of a broader sustainable development pathway, DRRM must be fully integrated with development processes through research, education, and awareness initiatives.

7.2 Way forward

The task ahead is to translate existing policies into action across all three tiers of government and stakeholders. The following are the key areas of focus for DRRM:

Institutional strengthening and collaboration

- Nepal reaffirms its dedication to achieving the SFDRR targets by 2030. The country is committed to implementing priority actions by aligning national strategies with SFDRR priorities and SDGs. We will be engaging stakeholders by fostering partnerships at all levels to enhances collaboration.
- Nepal will focus on strengthening DRRM governance and technical capacity at the federal, provincial, and local levels. The country will develop and adopt working documents, including guidelines for localizing national DRRM strategic action plans, multi-hazard risk assessment tools and methodologies, preparing risk sensitive development plans, and embedding risk into investment decisions. These

working documents will ensure the inclusion of vulnerable communities and groups.

- The NPDRR will be strengthened, and the platform will be established at local levels to enhance coordination between stakeholders at the grassroots levels, including engaging vulnerable communities. NPDRR will enhance the participation of development partners, partner organziations and vulnerable communities in programing and planning of DRRM and in their delivery. Coordination across the tiers of government will be strengthened by developing and implementing guiding documents in line with the DRRM Act and Regulation. The task ahead is to enhance coordination amongst all DRR actors and to translate policies into action across the three tiers of governance.
- Nepal will enhance and strengthen regional and global coordination and collaboration, especially with its immediate neighbors, China and India, with whom the country shares regional climate change issues that are linked by air and water.
- International coordination will be enhanced with the UN and relevant partners to build national capacity to bring the country to international standards, for example, in SAR and in accessing international funds for DRRM.

Preparedness and capacity building

- Preparedness for response must be escalated from federal to local levels to prepare essential logistics and to enhance capabilities for effective response. Risk informed plans and programs must be in place at all tiers of government to mainstream DRR in development initiatives and to develop an understanding of disaster risks.
- NDRRMA will spearhead a GIS-based multi-hazard risk assessment to manage disasters. NPDRR will be strengthened, and the platform will be established at local levels to enhance coordination between stakeholders at the grassroots level, including engaging vulnerable communities. Coordination across all the three tiers of government will be strengthened by developing and implementing guiding documents in line with the DRRM Act and regulations.
- Use of frontier technologies such as Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), Internet of Things (IoTs) and machine learning algorithms are felt essential for predictive modeling, more effective early warning system, and overall disaster risk governance.
- Active participation of private sector in DRR will be emphasized. DRR strategies will integrate corporate social responsibility and sustainability strategies, including business continuity plan. For the very purpose, private sector will be trained for emergency response and recovery protocols.
- As Nepal is committed to "Leave No One Behind," programmes will be designed to address the unique needs of women, children, the elderly, persons with disabilities, and marginalized communities. Vulnerable groups are being involved in decision-making processes. Such efforts ensure that all individuals receive warnings, education, and assistance.
- Nepal firmly believes that empowering local governments and communities enhances preparedness. Hence, new programmes will be designed to promote community leadership in disaster preparedness and response and, will continue to empower communities to emerge as the first responder.

Research, education, and awareness

- The government will invest in DRRM research and education to build national capacity to enhance knowledge and skills on understanding risks. A focal area for providing risk information to development programs will be assessing multi-hazard disaster risk at the national, provincial, and local levels.
- DIMS, initiated in 2019, will be fully strengthened, maintained, systematized, and operationalized in all 753 local levels (nationwide) for real-time data sharing. DIMS will ensure disaggregated data by social groups (gender, age, disadvantaged and marginalized groups, indigenous people, people with disabilities, etc.) in addition to hazards and impacts, to different sectors at various levels in different geographical locations.
- The COVID-19 pandemic taught Nepal a lesson to invest more in health and social protection. The impacts from the pandemic highlight the urgent need to merge DRR strategies into health preparedness systems, especially to support the most vulnerable populations. Building on successes, MoHA prioritizes social protection through risk-informed investments in health, infrastructure, and service delivery. As a nodal ministry, pandemic response must be led by MoHA, jointly with NDRRMA and MoHP, to effectively manage and coordinate disasters of this scale and nature.

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