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Disaster Risk Management in Nepal: Status, Achievements, Challenges and Ways Forward



Government of Nepal
Ministry of Home Affairs

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1.0 Overview

Situated in a unique geophysical setting of a relatively young and emerging mountain range, and a highly varied climate, Nepal is exposed to several recurrent hazards every year. Due to lack of land use planning and zoning, rapid and unplanned urbanization, low per capita income, loss of natural vegetation in upstream coupled with inadequate preparedness, and extant vulnerabilities, Nepal's exposure to multi-hazards often turns into medium to mega disasters. The national dataset on disaster events and losses, maintained and updated by Ministry of Home Affairs (MoHA),¹ has recorded more than a dozen types of hazards.

Nepal's exposure to disaster risks is heightened by extreme weather conditions and climate change impacts.² Water-induced disasters (namely flash floods, riverine floods and landslides), despite being the most predictable events cause increasing human sufferings every year. In terms of human loss, epidemic, earthquake, landslide, flood, fire, and thunderstorm appear as the key hazards claiming most lives. Fire, flood, thunderbolt, landslide and earthquake, however, are responsible for heavy loss of public infrastructure, private property and livelihoods.

Although not a recurrent phenomenon, earthquake is the most significant hazard in Nepal resulting into serious humanitarian crises.³ The Gorkha Earthquake 2015 alone led to 8,970 casualties, 22,300 injuries and destruction or damage of more than 800,000 houses and heritage sites. Almost one-third of the population was impacted and similar proportion of GDP was lost due to this earthquake. Government of Nepal immediately launched relief and recovery operations amidst overwhelming voluntary supports from communities, academia, media, NGOs, INGOs, private sector, bilateral and multi-lateral development partners, and friendly nations. The *Post Disaster Needs Assessment* (PDNA) accomplished within a month of the earthquake not only assessed the damage and loss due to the earthquake, but also outlined a recovery strategy together with an estimation of recovery cost for 23 thematic areas.⁴

2.0 Disaster Profile of Nepal

Nepal has a fragile geology and steep topography making it the 20th most disaster-prone country in the world. With regard to the relative vulnerability to climate change related hazards,

1 There are also few other datasets available. The MoHA dataset is now maintained in Nepal DRR Portal by National Emergency Operation Centre. Alternatively, National Society of Earthquake Technology (N-SET) also maintains DesInventar database. Thirdly, Nepal Red Cross Society (NRCS) also maintains its own dataset of disaster events in Nepal but there is wider gap of NRCS dataset with MoHA dataset. Finally, Department of Water-Induced Disaster Prevention (D-WIDP) also publishes national data on water-induced disaster loss annually.

2 They include avalanche, cold wave, drought, frost, hailstorm, heat wave, snowstorm, storm, thunder storm, windstorm, among others.

3 Note that Nepal is considered the 11th most earthquake-prone country in the world (NPC, 2015).

4 The PDNA came up with an estimation of US\$ 6.7 billion for the rehabilitation and reconstruction costs over a number of years, which the Government later revised the figure to nearly US\$ 9 billion.

earthquakes and flood hazards, Nepal ranks, respectively, in the 4th, 11th and 30th among 200 countries of the world. Nepal continuously faces disaster impacts of high magnitude and intensity from a multitude of natural hazards.

Table 2 reveals more than a dozen of hazards in Nepal, drawn from the active dataset maintained by the MoHA, covering a period of 45 years (1971 to 2016). A total of 21,856 disaster events have been recorded during this period. Annually, Nepal is exposed to approximately 500 events of disaster on average and fire is one of the most recurrent hazards. Number of fire incidences was recorded 8,721 times, followed by flood (3,950 times), epidemic (3,452 times) and landslide (3,246 times).

Epidemic is critically important in the sense that it is one of the single most killer hazards claiming the lives of more than 16,583 people (41.8 percent of the total disasters-induced deaths) during the period, though the trend is decreasing. It is followed by earthquake, landslide and flood. Table 2 also reveals the number of persons injured, number of houses and heritages damaged or destroyed, and the number of families affected by the disasters. It reveals that the number of persons injured due to disasters is double (a total of 79,147 persons) than the number of death. Epidemic and earthquake are the two most important disasters in terms of human injury accounting for 91 percent of the total.

Table 2: Major Disasters in Nepal and the Damage and Loss, 1971-2016

Disaster type	No. of death	No. of persons missing	No. of persons injured	No. of houses damaged or destroyed	No of affected families	No. of incidents
Epidemic	16,583	-	43,111	-	512,989	3,452
Earthquake	9,771	-	29,142	982,855	890,995	175
Landslide	4980	174	1,871	33,617	558,264	3,246
Flood	4,445	42	544	216,190	3,710,065	3,950
Fire	1,605	-	1,619	86,261	259,935	8,721
Thunderbolt	1,620	129	2,684	963	7,140	1,711
Cold wave	515	-	83	-	2,393	390
Snow storm	87	7	-	-	-	5
Avalanche	16	3	7	-	-	2
Wind storm	2	-	11	215	191	44
Hailstones/ heavy rainfall	9	-	24	155	3,280	131
Others*	26	2	51	1	36	29
Total	39,659	357	79,147	1,320,257	5,945,288	21,856

* This data is recorded since 2016 only. It includes high altitude, boat capsized, snake bites, wild animal attack and others.

In terms of property loss, during the period of last 45 years, a total of 1,320,257 houses were either destroyed or damaged. Of this, 982,855 (or 74.4 percent) houses were destroyed by earthquake alone, followed by flood. Likewise, a total of 5,945,288 families have been affected by these disasters, of which flood is attributed to affecting a large number of families (62.4 percent of the total), followed by earthquake, landslide, and epidemic. It is important to note that the Gorkha Earthquake 2015 has dramatically altered the disaster statistics of the country.

3.0 Gorkha Earthquake, 2015 and National Recovery Initiatives

On Saturday, 25 April 2015, a 7.6 magnitude earthquake struck Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years. The catastrophic earthquake was followed by more than 450 aftershocks greater than magnitude 4.0 in Richter scale. Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the main shock with the epicenter near the Mount Everest.

Almost one-third of the population of Nepal in 31 out of 75 districts has been impacted by the earthquake. Over 800,000 houses and heritages were destroyed or damaged. 14 districts were declared 'severely/ crisis-hit' for the purpose of prioritizing rescue and relief operations and another seventeen districts were declared 'heavily hit or affected.' The destruction was widespread covering residential and government buildings, heritage sites, schools and health posts, rural roads, bridges, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities.

Nepal's National Disaster Response Framework (NDRF) served as a key tool for coordination of earthquake response, facilitating decisions and instructions from the central to districts. The first meeting of the Central Natural Disaster Relief Committee (CNDRC) was held immediately after the earthquake, with the National Emergency Operation Centre (NEOC) providing an initial report to the CNDRC, recommending a focus on Search and Rescue (SAR), and lifesaving actions. Financial resource from the Prime Minister Natural Disaster Relief Fund was immediately allocated, and the government's cluster mechanism was instantly activated.

Government of Nepal made an official request for international assistance within hours of the earthquake. Several meetings with donor communities were convened to seek and coordinate international assistance for search and rescue and immediate relief operations. With the limited trained human resources and equipment available, Nepal Army (NA), Nepal Police (NP) and Armed Police Force (APF) carried out effective SAR operations. They were backstopped by dozens of international military SAR teams under the coordination of Multi-National Military Coordination Centre. The network of NGOs and INGOs based in Nepal swiftly rallied to support community relief efforts. Several national and international volunteer groups, business associations, humanitarian agencies (especially of youth and professionals like doctors and engineers) government employees, political parties and members of community based organizations were voluntarily mobilized in treatment of injured, setting up temporary shelters, supplying foods and non-food items.

National Reconstruction Authority (NRA) was established in 25 December 2015 with mandate for five years to lead and manage the recovery, reconstruction and rehabilitation activities of the earthquake affected infrastructures and families of 31 districts. The NRA's overall goal is to promptly complete the reconstruction works of the infrastructures destroyed or damaged by the earthquake with Build Back Better approach. It has formulated a Post Disaster Recovery Framework (PDRF) (2016-2020) on the basis of PDNA. The government has sufficiently allocated

the budget for reconstruction, rehabilitation and recovery initiatives and the NRA is providing technical support to individual household reconstruction and livelihood rehabilitation activities. Reconstruction activities are underway in the EQ affected district with support from government and non-government agencies. So far 22,234 private houses are complete and 49,828 private houses are being constructed, 200 health centers completed and 100 under construction, 1869 educational institutions completed and 1561 ongoing, 89 public buildings completed and 36 ongoing. Similarly, construction of 89 archeological heritages are complete and 36 are ongoing. The reconstruction process has followed principle of Building Back Better through adoption of national building codes.

4.0 Policy, Legal and Institutional Frameworks

DRM in Nepal is governed by the Natural Calamity (Relief) Act, 1982 which established institutional mechanism at various levels (Central, Regional, District and Local) for effective disaster management focusing primarily on preparedness and response. Now, considering the importance of disaster risk reduction, the *Constitution of Nepal* has clearly spelled out disaster management functions in all the three-tiers of government.

Moreover, disaster risk reduction began to receive more attention from Government side since the 10th Five Year Development Plan (2002-2007) and the subsequent periodic plans. Furthermore, in alignment with Nepal's commitment to the HFA, the Government of Nepal approved the National Strategy for Disaster Risk Management in 2009. This Strategy outlined 29 priority activities for risk reduction and mitigation. Box 1 presents major policy frameworks on DRM in Nepal.

Box 1: Existing legal and policy framework on DRM

- Constitution of Nepal
- Natural Calamity (Relief) Act, 1982
- Local-self Governance Act, 1999
- National Strategy on Disaster Risk Management, 2009
- National Disaster Response Framework, 2013
- Guidance Note on Disaster Preparedness and Response Planning, 2011
- National Guidelines for Search and Rescue, 2014
- District Disaster Preparedness and Response Plans
- Standard Operating Procedures of NEOC (and DEOCs)

Recently, Government of Nepal has also initiated a process to promulgate a new comprehensive and forward looking Disaster Risk Reduction and Management Bill for an effective DRM effort which would prioritize DRM across different levels of government, with a proposed Disaster Management Council chaired by the Prime Minister and a dedicated institution. It is hoped that after establishment and institutionalization of strong disaster risk reduction and management system including Disaster Management Information System (DMIS), disaster risk reduction, preparedness and response capability of the country will be strengthened and more robust data and information will be readily available for risk informed financing and planning in the overall development process.

Moreover, Government of Nepal has currently given priority to formulating National DRR Policy and Strategic Action Plan in line with SFDRR through a consultative and participatory process by engaging key government agencies, donors, UN agencies, non-government organizations, private sectors and humanitarian communities. Similarly, Government of Nepal is also planning to formulate and implement sub-national level strategies so as to fulfill the target of Sendai Framework.

Finally, in order to mainstream DRR into overall development planning process and strengthen cross-sectoral planning, DRR and CCM focal points have been established and streamlined in key ministries and agencies. Similarly, mainstreaming guidelines and urban resilience strategy formulation along with risk-sensitive land use planning activities are being undertaken by key ministries.

5.0 Global and Regional Commitments

Government of Nepal has been actively participating in all world conferences on disaster management (Yokohama, 1994; Hyogo 2005; and Sendai 2015), global platforms which occurs in two year intervals from 2007 onwards, and in the Ministerial Conferences on Disaster Risk Reduction in Asia. Moreover, Nepal is one of the signatories to these world conferences and has expressed commitment to fulfill its obligations and priority actions within the given time frame.

Yokohama, Japan (1994): The first world conference on disaster management was held in Yokohama, Japan in 1994 where Nepal actively participated. Following to the commitments made by Nepal and in line with the Yokohama Strategy, the Government of Nepal had prepared "National Action Plan on Disaster Management in 1996" incorporating all phases of the disaster management cycle.

Hyogo, Japan (2005 - 2015): The second world conference on disaster reduction management was held in Kobe, Hyogo, Japan in 2005 and Nepal participated and endorsed the goals and priorities for action between 2005 and 2015. Integration of DRR into sustainable development, develop and strengthen institutions to build resilience to hazards and build capacities for emergency preparedness, response and recovery were Nepal's major goals under HFA.

Sendai, Japan (2015 - 2030): The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 was adopted in Sendai, Japan, on March 18, 2015. The SFDRR's four priorities for action and seven global targets will be achieved by 2030, through the National Policy and Strategic Action Plan for DRR currently being formulated by the government in wider consultation with the stakeholders

Asian Ministerial Conference on Disaster Risk Reduction (2016): The Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR), held in New Delhi in November 2-5, 2016, endorsed the Asian Regional Plan for the implementation of the SFDRR for coming 2 years (2016 – 2018) with specific targets. The regional plan will be monitored and reviewed in every two year interval at regional level.

Nepal being an active UN member state and signatory to the global and regional commitments on disaster risk reduction is entitled to fulfill its obligations related to disaster risk reduction and

management. Nepal is trying its best with its limited trained human and financial resources to achieve all global targets and the priorities for action by 2030. However, Nepal needs further technical and financial support from development partners and friendly nations.

6.0 Key National Achievements

Nepal has achieved notable progress in disaster risk management during the last few decades. A number of legal, institutional and policy frameworks are already in place. Likewise, the New Constitution of Nepal has made provisions for disaster management at all levels of government. As per provisions of Natural Calamity (Relief) Act, 1982, Disaster Relief Committees at the central (CNDRC), regional (RNDRCs) and district (DDRCs) levels have been established and are made functional to support effective disaster preparedness and response through adoption of various policies, guidelines and standard operating procedures. Similarly, the Prime Minister Natural Disaster Relief Fund, Central Natural Disaster Relief Fund and other operational level funds have also been created, which become operational at the time of disasters.

All relevant government agencies have designated senior officials as Disaster and Climate Change Focal Person. Hence there is a good pool of human resources dedicated to DRM/CCA front and sharing and exchange of ideas has become more effective. Similarly, Government has prioritized mainstreaming of DRR into development planning process, with DRM being integrated into the national periodic plans. In addition, community based disaster management activities in different disaster prone areas have been initiated and have proved to be instrumental for raising awareness and reinforcing mutual- and self- help spirit at community level.

Government of Nepal has prepared and implemented a fifteen-year Sustainable Development Agenda of Nepal (2002-2017). Similarly, Government has incorporated disaster management subjects in school curricula since the mid-90s. Likewise, several academic and educational institutions have started various programs on disaster management. Currently, majority of the schools have the school safety programs and School Disaster Management Plan in place. Similarly, hospital preparedness programs are also being implemented in public and private hospitals and hub hospital concept is implemented throughout the country.

National Emergency Operational Centre (NEOC) has been established within Ministry of Home Affairs, which is now functioning smoothly. Likewise, 54 Emergency Operation Centers (EOCs) are operational at district and regional levels and Government is planning to expand EOC network to cover all 75 districts in the short term and all local level in the medium and long term. The NEOC and EOCs directly support in collecting and coordinating disaster related information, response, immediate relief and humanitarian assistance. Similarly, basic level Early Warning System has been established in the five major river basins, which are linked to EOCs and the communities. Several flood-prone basins have early warning systems established which are capable of transmitting automatic alert to the residents via SMS about increasing river water levels and potential floods. Noting the high risks posed by Glacial Lake Outburst Floods, the government in partnership with UNDP has recently installed a controlled drainage system in one of Nepal's most high-risk glacial lakes in Imja. The system has successfully reduced the water level of the lake by 3.4 meters, which has substantially reduced the risk of outburst flooding in the downstream.

Community-led Disaster Risk Management activities have been supported by the government

through enabling frameworks and policies, with 9 Minimum Characteristics being identified by the government as critical for a resilient community.

Moreover, 83 open spaces have been identified within Kathmandu Valley for shelter in the event of major disasters and in several such open spaces infrastructure development is under construction. Efforts are being made to ensure supply of safe drinking water, emergency kits, and shelter with warehouse capacity. Government is mulling over identification of open spaces in other densely populated cities outside of Kathmandu Valley as well.

Furthermore, implementation of National Building Code (NBC) has been made mandatory in all municipalities. Larger cities within the Kathmandu Valley like Kathmandu and Lalitpur are implementing an innovative, online electronic building permit system. Likewise, mason trainings on safe building construction practices as per the NBC are being organized by both government and non-government organizations. Retrofitting of critical infrastructure like hospitals and schools are also being undertaken in collaboration with several development partners.

Institutionalization of a robust Disaster Management Information System (DMIS) has been initiated with the establishment of DRR portal as one point shop to facilitate collection, analysis and dissemination of disaster related information. Likewise, cluster approach has been institutionalized for effective implementation and better coordination in disaster management.

The Government of Nepal has already formulated a National Strategy on Search and Rescue (SAR) and initiated a process to operationalize the medium and light SAR teams as well. Get Airport Ready for Disasters (GARD) is another significant activity that Nepal has initiated covering Kathmandu and Nepalgunj airports. Establishment of the Humanitarian Staging Area is one of the major activities that furthers the readiness of airports in face of disasters in Nepal. Establishment of the disaster preparedness network (DP-Net) was another milestone to foster coordination among disaster management related government and non-government agencies and serve as a bridge between them. A common radio frequency for responders has already been agreed upon.

Furthermore, Government of Nepal has established four regional warehouses for stockpiling of emergencies supplies in respective areas. Currently, one warehouse is under construction and Government is planning to establish several more warehouses in each state covering all geographical areas.

7.0 Challenges

Since the declaration of new Constitution of Nepal in September 2015, Nepal is passing through a transition of state restructuring from unitary centralized system of governance to federal decentralized system of governance. The government is drafting new comprehensive disaster risk reduction and management bill as per the Constitution of Nepal. In this context, the major challenges that Nepal faces are as follows:

1. Nepal's existing disaster management law and institutional arrangement is response centric giving more attention to providing rescue and relief in the aftermath of a disaster and does not fully support disaster risk reduction and preparedness for recovery which is

essential for building resilient communities and nation. In this context, there is dire need for comprehensive disaster management legislation that encompasses the entire disaster management cycle with appropriate institutional set up that will remain relevant in the changed national context..

2. Despite on-going efforts on mainstreaming disaster risk reduction into development planning, which is moving ahead rapidly, the process has faced several setbacks and challenges due to inadequate technical skills and willingness to shift to risk-informed, evidence based development planning. Thus, disjoint remains in approaches for integrating disaster risk reduction and climate change adaptation into national development planning.
3. As evident by Gorkha Earthquake of 2015, Nepal's capability to respond to mega disaster is highly constrained by limited high-tech equipments and specialized capacities to conduct effective SAR operations. It has also limited capacities to leverage advanced technologies in coordinating and mobilizing international humanitarian support at the time of mega disasters.
4. Nepal needs to enhance its technical and functional capacities to fully utilize available expertise, experiences, research, and human resources available within and outside the region to support its on-going efforts. Nepal can benefit from cross learning between the countries in the area of early warning, raising technical skills, disaster management information system upgradation and information sharing, hazard and risk mapping and developing capacities for risk informed approach to sustainable development.
5. Nepal's disaster management information system should be strengthened. Disaster information so far remains scattered and disintegrated, which constrain making timely analysis of loss and damage, and building scenarios for future impacts that could have helped in risk informed financing and planning for preparedness, response, risk reduction and ultimately resilience enhancement.
6. Investments in DRR have been limited overall and depends to a large extent on funding from development partners. This situation is however expected to change with the next fiscal year budget proposing a significant allocation from the government.
7. Development programmes and policies are not fully cognizant of, and informed by risks. As a result, there are continued and recurrent impacts on sectors, dragging down hard-earned development gains.
8. There continue to be siloed approaches in development and also emergency management- for instance, effective integration of forecasts and early warning into decision-making remains a challenge.
9. Increasingly variable weather and climate, probably attributable to climate change poses a great threat to lives and livelihoods of large sections of Nepal's population who are either directly or indirectly dependent on agriculture-and natural-resource based activities as source of income.

8.0 Ways Forward

Despite of several challenges faced by the country, Nepal is striving hard to reduce disaster risk and improve its preparedness and response mechanism. Based on the progress made over the years since the commencement of the IDNDR and HFA, and lessons learnt from past efforts of

responding to disasters, Nepal is set to formulate new comprehensive disaster risk reduction and management legislation, National DRR Policy and Strategic Action Plan that fully support multi-faceted and multi-stakeholder engagement in reducing the disaster risks and preparing for effective response and recovery as envisaged by SFDRR.

1. A Comprehensive Disaster Risk Reduction and Management Act as per the Constitution of Nepal and international commitments and Strategic Action Plan in line with SFDRR will be implemented by adopting Build Back Better principle and Whole-of-Society Approach to realize the vision of resilient Nepal. Nepal will strengthen disaster management governance from federal to local level.
2. Risk informed approach to sustainable development backed by understanding of risks will be streamlined at all levels and across the sectors to integrate principles and practice of Disaster Risk Reduction and Climate Change Adaptation into planning, budgeting and monitoring and evaluation.
3. With the priority to engage whole of society into disaster risk reduction agenda and learning from experiences of other countries, new institutional set up for disaster risk management from national to sub-national levels in line with new federal system of governance, will be established.
4. To achieve the goal of resilient Nepal, emphasis will be given on fostering partnership with non-state actors, private sector and international agencies for effective disaster risk reduction, response and recovery.
5. Learning from Gorkha Earthquake of 2015, disaster preparedness for response and recovery will be strengthened at all levels through provisions of adequate logistics, capacities, guidelines and SOP, and establishment of medium and light SAR teams.
6. A network of emergency operation centers and early warning system will be expanded and further strengthened to support disaster risk reduction including response and recovery and coordination of humanitarian actions that directly result into saving lives and reducing the losses.
7. Disaster Management Information System (DMIS) will be strengthened by the government to produce reliable statistics on disaster loss and damage, and report on anticipated disaster to guide priority setting for disaster management planning at national and sub-national levels and support in risk informed decision making.
8. Government will initiate a massive program on community based disaster management activities in all disaster-prone areas (both urban and rural) of the country based on the experiences from 2015 earthquakes and ensure developing a mechanism to mobilize youth, volunteers and self-help groups in a massive scale at the time of disasters.
9. Government is committed to develop a mechanism for cross-learning between countries about knowledge, research and experiences relevant to disaster risk reduction and management and creating platforms for disaster information sharing between Nepal and neighboring countries



DPM and Home Minister Honb'le Mr. Bimalendra Nidhi launching EQ 2015 Lesson Learnt Report

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