

Nepal Disaster Report, 2017 'The Road to Sendai'

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Editorial Board

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Executive Summary

NDR 2017: Purpose and Process- Nepal is exposed to a variety of natural hazards and human induced disasters. More than 80 percent of the total population of Nepal is at risk of natural hazards; such as floods, landslides, windstorms, hailstorms, fires, earthquakes and Glacial Lake Outburst Floods (GLOFs). The country is among the 20 most disaster-prone countries in the world. In part, this is because Nepal is in a seismically active zone with a high probability for a massive earthquake. Globally, Nepal ranks 4th and 11th in terms of its relative vulnerability to climate change and earthquakes, respectively. Out of 21 cities around the world that lie in similar seismic hazard zones, Kathmandu city is at the highest risk in terms of impact on people.

Minister of Home Affairs-MoHA has been producing biennial disaster reports (Nepal Disaster Report - NDR) since 2009 with the support from different development partners and stakeholders such as UNDP, DP-Net Nepal, NRCs and others. The published series of NDRs includes NDR 2009, NDR 2011, NDR 2013 and NDR 2015. The publication of NDR 2017 has been a joint initiative between MoHA, UNDP, DP Net and other disaster related development partners.

The main purpose of NDR 2017 is to highlight Nepal's periodic experiences in DRM, documenting key learning issues and challenges in the course of managing disaster risk and identifying future priority actions for effective disaster response, risk reduction and recovery from disasters.

The methodology for this assignment involved both quantitative and qualitative approaches based on social sciences research practices. Key documents/ reports (published and unpublished) on DRR and CCA were obtained from relevant ministries/departments, and key development partners and academic institutions. This was complemented by open access online documents retrieved mostly from the worldwide web and interactions with disaster risk management professionals. The NDR also provides the basic information such as losses of life, damage of houses, disappearance of people and injury during different disasters in the country.

Key Hazards of the Years- The MoHA dataset archives maintain data for a total of 16 kinds of active disasters in Nepal. The disasters noted are, in alphabetic order: *Asinapani* (heavy rainfall with hailstones), avalanche, boat capsize, cold wave, drowning, earthquake, epidemic, fire, flood, heavy rainfall, high altitude, landslide, snow storm, lightning, wind storm, excluding the "other" category. This simple fact well illustrates that Nepal is exposed to multiple hazards at a time.

According to the MoHA dataset, during the period of two years under review (2015 and 2016), a total of 16 types of disasters have been noted and 13 types of disasters have been recorded. A total of 2,940 events of disaster have been recorded, of which incidents of fire are highest (N=1,856), followed by incidents of lightning (N=299), landslide (N=290), flood (N=244) and heavy rainfall (N=118). Other disasters also took place but less in frequency (by two digits or even less).

Of these killer hazards, earthquake stands out from the rest in all respects – death, disappearance as well as human injuries. This is true of the 2015 Earthquake also. Of the total 9,708 human deaths, earthquake alone claimed the lives of a total 8,970 persons (92.5 percent). After earthquakes, landslide, lightning, fire and floods claimed the lives of most of the people (in a range between 101 and 276 each) in those two years. Note that over the years, lightning is becoming one of the leading killer disasters in Nepal.

All disasters recorded in MoHA database reveal that a total of one million, eighty-five thousand, seven hundred ninety-seven houses were damaged during the review period, of which 98.7 percent of houses damaged was caused by earthquake. This is followed by a host of other disasters attributable to fire and landslide (0.3 percent) and to flood, heavy rainfall and windstorm (0.2 percent).

Of the total, more than seven hundred nine billion rupees of economic loss during the review period (2015 and 2016) or about 99.5 percent was due to earthquake alone. Another category of disaster that caused second most severe economic loss is fire. But its effect was far less (0.3 percent) compared to the effect of the earthquake.

In terms of impact on environment and resources, the earthquake triggered at least 2,780 landslides and many ground cracks in 31 districts, significantly damaging settlements, infrastructures, agricultural lands, forests and water resources. It was also identified through satellite imaging that the frequency of landslides was three times greater than that before the earthquake. A large avalanche in Langtang valley destroyed popular trekking destination of Langtang village and flattened the nearby forest.

A macroeconomic impact assessment, part of the PDNA, reveals that the “total damage to existing stock of assets has been estimated at over NPR 500 billion, with economic losses that flow from destruction, estimated at nearly NPR 200 billion. Taken together both figures represent an economic force equivalent to about one third of Nepal’s GDP” (NPC 2015, Executive Summary, p. 76). The report concludes that “the earthquake upset the nation’s high aspirations for swifter economic progress in the short run” shaking the national hope for

graduation of the country from its current status as a Least Developed Country (LDC) to developing country, possibly by 2022.

Experiences from the Relief Operation- Relief operation started from the very second hour of the earthquake and lasted till 19 May 2015. Hence, relief operation lasted for about a little less than a month. Government of Nepal remained quick and swift during initial phase of search, rescue and relief response. The first meeting of the Central Disaster Relief Committee (CNDRC) took place at NEOC within first two hours of the tremor, and the first emergency meeting of the Cabinet took place within first four hours. These meetings managed to (a) immediately release NRs five hundred million at the dispense of CNDRC, (b) call for international humanitarian support, and (c) declare emergency in 11 “crisis-hit” districts (MoHA 2016), among other decisions. Certain institutional and policy frameworks put in place earlier enabled this quick initial response. The role of NEOC and the National Disaster Response Framework (NDRF), 2013 assigning clear and time-based roles and responsibilities are cases in point.

However, there was breakdown of communications and information networks and it took time to restore them. In the wake of the 2015 earthquake, Nepal’s communications infrastructures crumbled away immediately both in literal and figurative sense, says one report (EIAS 2016). On the fifth day of the earthquake, the Government made a number of decisions on relief. Families which lost family members, or whose houses collapsed or were damaged, would be getting immediate relief in cash. There were, however, troubles in identification of needs and managing supplies of relief materials and services. To address the problem of mismatch between the relief items in need on the ground and the supply of donations of such items, the CNDRC on 30 April 2015 instructed key government secretaries to sit together to identify and finalize the list of items in need, subject to be endorsed by CNDRC.

As the relief operation progressed, observation shows that, in terms of effect, CNDRC remained less responsive compared to the urgency of the circumstance. On the one hand, there was a hierarchy of command, control and coordination mechanism, on the other, there was also a parallel entity created for oversight and monitoring primarily comprising political representation. It created confusion.

Experiences from the Ongoing Recovery and Reconstruction- From 19 May 2015, the Government of Nepal began a transition from relief operation to the recovery phase. The National Reconstruction Authority (NRA), a coordinating and facilitating body formed by the Government of Nepal to manage, oversee and coordinate the reconstruction work was constituted on 25 December 2015, following the enactment of the NRA Act on 20 December. In May 2016, the NRA brought a new *Post Disaster Recovery Framework* (PDRF) (NRA 2016). The PDRF lays out strategic recovery objectives and summarizes in an integrated manner the policy

decisions, institutional arrangements, financing and financial management strategies as well as implementation and monitoring systems that are being put in place to plan and manage recovery and reconstruction.

Private house reconstruction is NRA's one of top priority areas. In two years after the devastating earthquake that destroyed over 765,000 houses, reconstruction of private houses has gathered pace. As of August 2017, 632,047 beneficiaries have signed for the grant agreement and 603,072 of them have collected the first tranche whereas only 56,687 beneficiaries have received the second.

A study conducted by NRA to identify vulnerable settlements after the 2015 earthquake recommended that a total of 2,751 families of 112 communities have to be relocated to safer places (NRA, 2017b). NRA has enforced a new procedure to make necessary arrangements for the beneficiaries and families of the hazard-prone settlements that have been affected by the earthquakes.

DRM Regulatory Frameworks in Nepal- Nepal's current constitution, for the first time, mentions about disaster risk management in the country, and it has clearly assigned DRM as a concurrent responsibility of different tier of governments, but particularly of the local governments. Article 51 stipulates the policies the state shall pursue. The sub-article G that relates to "policies concerning protection, promotion and use of natural resources," does mention that the state shall formulate policies related to development of sustainable and reliable irrigation through prevention of water-induced disasters and river management.

On 24 September 2017, the legislative-parliament unanimously passed a new Disaster Risk Reduction and Management Act, 2017. The Act is considered far progressive than the hitherto existing Natural Calamity Relief Act, 1982 in many respects. Its approach to disaster is much comprehensive and recognizes both risk reduction and management as integral part of the task. Instead of committee-based coordination mechanism, the Act proposes a clear multi-tier institutional structure of disaster risk reduction and management (at the centre, the provinces, the districts and the local levels).

The government of Nepal is recently developing National Disaster Risk Reduction Policy and Strategic Action Plan aligned with SFDRR, one which will replace the NSDRM, 2009. There is wider hope that these two important documents will serve as a turning point for Nepal to be a disaster resilient nation.

Carving the Road Ahead to SFDRR- Nepal actively implemented HFA priority actions (from NSDRM2009 onward). Nepal's performance in translating HFA's commitments into reality achieved a mixed success (MoHA 2015, UNDP Nepal 2015). On top of that, the progress and

achievements also remained uneven – as evidenced in national progress reports submitted to the UN on the implementation of the Hyogo Framework for Action. The final report submitted to the UN, entitled “National Progress Report on the Implementation of the Hyogo Framework for Action” (MoHA 2015) and an independent assessment of DRM integration into development plans (UNDP Nepal 2015) show ample space for improvement despite a few achievements.

The agenda of strengthening policy and institutional framework remained largely unachieved. On the front of strengthening institutions at national level Nepal remained lagging behind. The much awaited new DRM Bill was not materialized during this period. On issues of strengthening capacity at community level, as MoHA (2015) makes it clear, MoFALD and the NRRC developed minimum criteria for community resilience and used them to support standardized approaches at building community capacity for DRR. Through this, over 635 VDCs and municipalities (a quarter of the population) were accessed. At the municipal level, 58 municipalities have been equipped with fire brigades.

To enhance capacity to monitor and respond, MoHA has established NEOC in Kathmandu and expansion of EOCs in all 5 regions, 42 districts and 5 EOCs in municipalities have been created. A resilient communication system has been put in place through these EOCs. A tailor made Disaster Management Information System named SAHANA has been developed, and it will be institutionalized both at the centre and the district levels.

The Sendai Framework aims to achieve “substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries” by 2030. This expected outcome will be monitored through indicators against seven targets. The seven targets aim at contributing in reducing (a) mortality, (b) number of affected people, (c) economic losses, and (d) damage to critical infrastructure and in increasing (e) the number of national and local DRR strategies, (f) level of international cooperation, and (g) availability of and access to multi-hazard early warning systems and disaster risk information.

The new constitution of Nepal, (2015) provides clear role and responsibilities to the local government related to DRM. Hence, DRM activities are one of the priority activities to be implemented at the local level. Therefore, hopefully in the days/years to come DRM activities are well mainstreamed in the local level (7-points) planning, budgeting, monitoring and evaluation process. However, to successfully accomplish this task, the local government needs more trained human resources, adequate financial support and technical inputs in a more regular manner.

Government of Nepal in close partnership with the UN agencies and other development partners is developing “National DRR Policy & Strategic Action Plan for Nepal, (2017-2030)” which will be finalized within 2017. This DRR policy and strategic action plan responds to SFDRR priority areas and aims at making Nepal a safer and resilient nation by 2030.

Moreover, the country is committed to successfully achieve SFDRR goals, SDGs, Paris agreement and several other regional and global commitments. In this context, the mainstreaming of such goals and targets into the national and local development plans are most important. Without proper mainstreaming, allocating resources and supporting local authorities achieving such targets will remain a challenge for Nepal.

Key Priority Issues for the Next Two Years- The process of preparing NDR 2017 through desk work and consultations yields a number of action agenda that could be considered as key priority issues for the next two years or so. We present the key action agendas as follows:

1. Creating an effective institutional set up throughout the country in order to translate the newly endorsed Disaster Risk Management and Reduction Act 2017.
2. Training and capacity building as a regular process at all levels.
3. Instituting a practice of risk-informed development for effective integration of DRR and CCA and for effective mainstreaming of DRR/CCA into sectoral development planning.
4. Allocation of adequate budget for standalone DRM/CCA activities as well as sectoral allocation of budget for DRR activities for effective mainstreaming.
5. Giving the local levels the leadership stake for DRM in view of federalization of the country and in view of the spirit of the Constitution of Nepal 2015 and the newly endorsed Disaster Risk Management and Reduction Act 2017, and the National DRR Policy and Strategic Action Plan in the making.
6. Consolidating DIMS in order to create a one-stop database and information hub accessible to all, and linking it with other systems of information collection, such as flood early warning, seismological information, etc.
7. Strengthening the national capacity of SAR to the level of INSARAG-accreditation by creating a single and integrated SAR capacity and institution.

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Chapter 1

Introduction

1.1 Background

Nepal is exposed to a variety of natural hazards and human induced disasters. More than 80 percent of the total population of Nepal is at risk of natural hazards such as floods, landslides, windstorms, hailstorms, fires, earthquakes and Glacial Lake Outburst Floods (GLOFs). The country is among the 20 most disaster-prone countries in the world. In part, this is because Nepal is in a seismically active zone with a high probability for a massive earthquake. Globally, Nepal ranks 4th and 11th in terms of its relative vulnerability to climate change and earthquakes, respectively. Out of 21 cities around the world that lie in similar seismic hazard zones, Kathmandu city is at the highest risk in terms of impact on people.

Ministry of Home Affairs (MoHA), Ministry of Federal Affairs and Local Development (MoFLAD), Ministry of Urban Development (MOUD) and other ministries and departments have been the main agencies of the Government of Nepal to contribute to reducing the disaster risks in coordination with different development partners.

MoHA has been producing biennial disaster reports (Nepal Disaster Report - NDR) since 2009 with the support from different development partners and stakeholders such as UNDP, DP-Net Nepal, NRCS and others. The published series of NDRs includes NDR 2009, NDR 2011, NDR 2013 and NDR 2015. The publication of NDR 2017 has been a joint initiative between MoHA, UNDP, DP Net and other disaster related development partners.

1.2 NDR 2017: Purpose and Process

The main purpose of NDR 2017 is to highlight Nepal's periodic experiences in DRM, documenting key learning issues and challenges in the course of managing disaster risk and identifying future priority actions for effective disaster response, risk reduction and recovery from disasters.

The process of preparing the NDR 2017 includes:

- Reviewing the past NDRs (NDR 2009, NDR 2011, NDR 2013 and NDR 2015) to explore areas for improvement in terms of its quality and contents;

- Documenting the major disaster events that occurred during last two years and current disaster context of Nepal;
- Presenting given policy, legal and institutional set ups for managing disasters in Nepal including recent discussion on DRM Bill and process of formulating National DRR Policy and Strategic Action Plan;
- Consolidating experiences, challenges, lesson learned in managing disaster risks, and institutional efforts for recovery and reconstruction; and
- Supporting efforts of baseline creation for loss and damage caused by natural disasters.

Preparation of NDR 2017 follows a participatory approach under the overall guidance of MoHA through its Disaster Management Division (DMD) and from the technical support of UNDP. An editorial board led by MoHA with representatives from DP-Net and UNDP provided guidance on overall content and structure of the report, depth and width of various chapters to be covered and quality of the report. A two-person expert team hired by UNDP worked closely under the supervision of MoHA and engaged other stakeholders in validation of information received from various sources. MoHA facilitated organizing consultation meetings with government agencies and other partners and getting access to information. UNDP through its CDRMP supported in data collection and organizing field verifications and doing analysis while the DP-Net provided secretarial support to the expert team in organizing meetings and managing information.

The draft NDR 2017 was shared among relevant stakeholders for wider consultation and to get feedbacks for further improvements and finalization.

1.3 Methodology

The methodology for this assignment involved both quantitative and qualitative approaches based on social sciences research methodology. Key documents/ reports (published and unpublished) on DRR and CCA were obtained from relevant ministries/departments, and key development partners and academic institutions. This was complemented by open access online documents retrieved mostly from the worldwide web.

Desk Work: The desk work was the lynchpin of the task of the production of NDR 2017. The initial segment of work involved reviewing several documents, legal frameworks, policy documents, guidelines, SOPs, documents related to HFA, SFDRR, etc. During this time the past NDRs were also reviewed.

Key Informant Interview (KII)- In order to identify the broader spectrum of the issues being raised in NDR 2017, a few key informants were identified and KIIs were done. We interviewed a

number of persons at MoHA, UNDP Nepal, DP-Net Nepal, AIN, etc. to solicit their views on HFA achievements, areas of improvement and achieving SFDRR priority areas.

Field Visit- A small team of stakeholders (from MoHA, editorial board and the consultant) visited Kaski district during this assignment to enquire and witness the on-going DRR/M initiatives aimed at capturing good practice of mobilization of volunteers and promotion of volunteerism especially in the immediate aftermath of the 2015 earthquake. UNDP supported the field study and collection of documents and reports etc.

In the following section, we present a brief account of the outcome of the desk review.

1.4 Key Messages of the Earlier Nepal Disaster Reports

The first Nepal Disaster Report (NDR) was published in 2009. Since then, the MoHA, in close partnership with appropriate stakeholders, has been publishing NDRs in every two years. Three of the four NDRs, published so far, focused on certain areas covering pertinent issues related to disaster risk management in Nepal. The NDR also provides the basic information such as life losses, houses damaged, missing people and injured by different disasters in the country. A brief summary of the last four NDRs are as follows:

Nepal Disaster Report 2009: The Hazards and Vulnerability- Being the first national disaster report of Nepal, this report focuses on highlighting the hazard and vulnerability of the country so as to raise the awareness among policy makers, practitioners, researchers, students and others to understand and implement appropriate policy, decision making process and activities to reduce the disaster and climate risk of the country. This report anticipated that the Government of Nepal (GoN) and other DRM actors will translate the ideas presented in this report to actions, which is yet to be reviewed.

Nepal Disaster Report 2011: Policies, Practices and Lessons- This report reflects the status of disaster risk management efforts initiated by both government and non-government agencies including community in Nepal. In a way, this NDR is compilation of disaster occurrences, and the efforts made by both government and non-government agencies including community members to reduce the negative impacts of disasters and reducing future risks. Likewise, this NDR also look into the level of hazards that the country is exposed to, explore the social, economic and political meanings of the disasters to the country and tried to make a case to effectively manage such challenges.

Nepal Disaster Report 2013: Participation and Inclusion-The 2013 Nepal Disaster Report focuses on participation and inclusion. In addition to regular chapters as in previous NDRs such as disaster risk management, conceptual issues and disaster scenario, it also has chapters on

participation, inclusion and good practices. This report cited a few relevant legal instruments of participation and social inclusion related to DRM in Nepal such as Constitution of Nepal 2007, Local Self Governance Act 1999, The National Strategy on Disaster Risk Management 2009 and Local and District Disaster Risk Management Planning guidelines. This report also captures a few good practices on disaster risk management such as early warning, community based disaster risk management, warehouse and stockpiling, capacity building, indigenous knowledge, mainstreaming DRR into development and volunteerism.

Nepal Disaster Report 2015- This report contains preliminary information on 2015 earthquake and also contains a few papers on different issues, such as mass casualty management, emerging trends in disaster management policy in Nepal, impact of Hudhud Cyclone in Himalayan Region of Nepal and Seti flash flood. Likewise, it also has basic information on disaster management in Nepal and presents a synthetic analysis on disaster events during the two years period.

While the initial three NDRs (2009, 2011 and 2013) focused on certain themes relevant to the situation and context of Nepal, the 2015 NDR, however, was a compilation of a few case studies and reports. However, all four NDRs have successfully compiled relevant disaster related information (as obtained from NEOC/ MoHA). The NDR 2017 differs from all earlier NDRs in the sense that it focuses more on reviewing the achievements Nepal has made during HFA implementation (2005-2015), recent initiatives related to disaster risk management in the country and looks forward the way SFDRR can be effectively implemented within the given time frame, 2016-2030.

1.5 Learning from HFA and Key Thrust of the 'Road to Sendai'

The Hyogo Framework for Action (HFA), 2005-2015, had five priorities for action, namely; ensure that DRR is a national and local priority with a strong institutional basis for implementation; identify, assess and monitor disaster risk and enhance early warning; use knowledge, innovation and education to build a culture of safety and resilience at all levels; reduce the underlying risk factors; and strengthen disaster preparedness for effective response at all levels.

Nepal's HFA report for 2013 to 2015 (**Table 1.1**) indicates the aggregated average level of progress of all five priorities for action just above 50 per cent of the total (57%) achievement. This result clearly indicates that Nepal has done some foundation work in the field of DRR, but there is still a long journey ahead to a disaster resilient Nepal. Both the 2013-2015 HFA progress report and the ten-year report (2005-2015) clearly indicate the major challenges to successfully achieve the HFA priority for action. The most common challenges to successfully implement all five priority for action under HFA were: Lack of pragmatic DRM Act, relief/response centric

DRM activities, a lack of dedicated high level DRR/M institution, weak implementation of activities, poor monitoring and evaluation mechanism, inadequate trained human resources at all levels, ineffective information management system, etc. among others.

Table 1.1: Assessing Nepal’s progress on HFA

Priority for Action	Level of Progress (scale: 1-5)
Ensure that DRR is a national and local priority with a strong institutional basis for implementation	3.00
Identify, assess and monitor disaster risk and enhance early warning	2.50
Use knowledge, innovation and education to build a culture of safety and resilience at all levels	3.00
Reducing the underlying risk factors	2.50
Strengthen disaster preparedness for effective response at all levels	3.25
Aggregated average level of progress	2.85

Source: HFA Progress Report (MoHA 2015)

With an understanding and internalization of the main challenges that the country faced during the HFA period (2005-2015), a successful implementation of SFDRR (2015-2030) is admittedly not an easy task. These two reports and many other government documents related to DRM/R indicated several times that by 2015, the country will have a new and comprehensive DRM/R Act that will change the DRM paradigm from relief/ response centric approach to more comprehensive DRR and linking DRM/R with mainstream development process and a dedicated DRM/R institution among others.

The four priority areas of SFDRR¹ are inter-linked and are equally important to make Nepal a disaster resilient nation. However, the majority of DRM related initiatives in Nepal are somehow tilted towards post-disaster response activities. Having said this, however, the ongoing reconstruction initiatives in Nepal after the 2015 earthquake are still moving at a snail’s pace, with full of political interest of the ruling parties. Further, it raised local people’s expectations and undermined self-help spirit of the people and community cohesiveness.²

¹ The four priority areas of SFDRR are: a) understanding disaster risk, b) strengthening disaster risk governance to manage risk, c) invest in disaster risk reduction, and d) enhance disaster preparedness for effective response and build back better.

² For an overview of the ratio of the beneficiaries receiving house reconstruction grants as an evidence of our overall observation on Nepal’s success in reconstruction, see [Figure 2.1](#).

With the above learning from the past especially during HFA period and NSDRM (2009), Nepal can achieve the above four priority areas of SFDRR within the stipulated time if both government and non-government sectors including development partners work together with a collective approach, clear roles and responsibilities, budget and time frame. Both parties need to open up more and share information along with targeted activities to accomplish all four priority areas of SFDRR. Both government and non-government agencies need to work more aggressively on the monitoring and evaluation of the on-going initiatives on a more regular basis and build/ improve future course of actions and targets.

Some of the major anticipated challenges to successfully achieve SFDRR, as of now, would be effective implementation of the DRM Act which the legislative-parliament passed on 24 September 2017. Bringing DRM and CRM into a single integrated framework at local level implementation and proper mainstreaming DRR and CCA into development process are the other foreseen challenges.

Budget constraint for DRR activities is yet another perennial challenge in realizing SFDRR priorities. On the one hand, there is still no practice of sectoral allocation of budget for DRR and preparedness priorities. On the other hand, stand alone budget for DRR and preparedness represents tip of the iceberg. According to a UNDP report, about five percent of the total capital expenditure of the government is being spent in DRR/M activities through various government organizations (UNDP Nepal 2015), which obviously is quite insufficient given the scale of disaster effects in the country.

Chapter 2

Periodic Review of Data on Disaster And Estimation of Damage and Losses

2.1 Review of DIMS in Nepal

Status Review-Nepal's National Emergency Operation Centre (NEOC) operates Nepal Disaster Risk Reduction portal (DRR Portal) and runs DIMS, called Sahana (see [Figure 2.1](#)). Sahana is an open source disaster information management software. It allows making disaster data easy to find and use for analysis. The first version of Sahana was created in Sri Lanka to help coordinate the response to the 2004 Tsunami. Since then it has been deployed in over 30 countries.



Figure 2.1 Screenshot view of Sahana software used by NEOC

Nepal has developed a geo-spatial based data management system. Disaster data are first maintained in Excel format. The data are then geo-referenced using QGIS software, and uploaded with layer into Geo Node system. It allows in creating and customizing maps and publishing them. For this purpose, Nepal's DIMS applies Geo-Portal (see [Figure 2.2](#) for Nepal Geo-Portal), a web-based application and platform for developing geospatial information systems (GIS) and for deploying spatial data infrastructures. See [Figure 2.2](#) for a snapshot view of Geo-Portal maintained by MoHA.

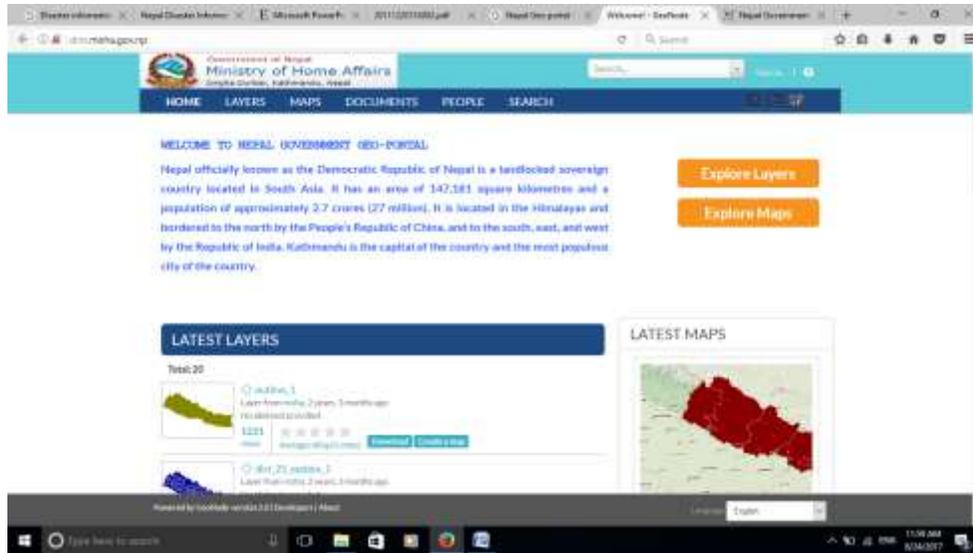


Figure 1.2: Screenshot view of Nepal government Geo-Portal

Nepal’s DRR Portal demonstrates at least three areas of improvement in order for the system to be effective. First, the Sahana data management system and the whole DRR portal is weak in the sense of forecasting, early warning and timely dissemination of alert information aimed at early preparedness. This is to be noted that one of the most conspicuous areas of improvement the Nepal DRR Portal needs in dissemination of early warning at community level. Second, NEOC’s downward network (that is, the functioning of DEOCs) is weaker by institutionalization, resource back up and functioning. As a result the vertical flow of information needs serious improvements. Finally, DRR Portal and the entire Sahana operates as a standalone system of disaster information management. This is poorly linked to other similar sources of disaster and hazard (such as hydrological and meteorological) information that could be linked together to make the system robust.

2.2 A Note on Major DRM Stakeholders

There is a great potential of a wider collaboration for converting DRR portal as an integrated and comprehensive system of DIMS in Nepal linked to forecasting and “end-to-end” and “people-centered” early warning.³ For this, hazard information and disaster data have to be linked with hydro meteorological data, satellite images, land-use and topographic maps/data,

³ Effective “end-to-end” and “people-centered” early warning systems may include four interrelated key elements: (a) disaster risk knowledge based on the systematic collection of data and disaster risk assessments; (b) detection, monitoring, analysis and forecasting of the hazards and possible consequences; (c) dissemination and communication, by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and (d) preparedness at all levels to respond to the warnings received. These four interrelated components need to be coordinated within and across sectors and multiple levels for the system to work effectively and to include a feedback mechanism for continuous improvement. Failure in one component or a lack of coordination across them could lead to the failure of the whole system (UNISDR 2017).

together with census data, socio-economic characteristics and poverty profiles of the population. In the absence of a functional coordination and technological collaboration between different government institutions, Nepal is missing the opportunity in this regard. In this section we briefly describe potential collaborators of creating comprehensive DIMS in Nepal with functional linkage with accessible forecasting and early warning.

Department of Hydrology and Meteorology (DHM) is the principal government institution to generate and manage data related to meteorology and hydrology: The principal activities of DHM are to collect and disseminate hydrological and meteorological information for water resources, agriculture, energy, and other development activities. It also issues hydrological and meteorological forecasts for public, mountaineering expedition, civil aviation, and for the mitigation of natural disasters. DHM also develops operational flood forecasting and early warning system for major flood prone rivers of Nepal.

The DHM also has a flood forecasting system. The principal activities of food forecasting project are to establish, operate and manage flood forecasting stations and upgrade them with real time telemetry system. It also assesses hazards, vulnerabilities and risks due to floods in major river basins. It has innovated river flow forecasting models for major rivers of Nepal, thereby establishing flood early warning systems on major flood prone rivers of Nepal.

Department of Water Induced Disaster Management (DWIDM) was created to contribute in achieving the national goal of poverty alleviation through minimizing human casualties and damages of infrastructures due to water induced disasters by the appropriate management and conservation of rivers and river basins in Nepal. Its mandates are several, including but not limited to, formulating and implementing water-induced disaster management policy and plans; preparing hazard maps and risk zoning; strengthening the network for disaster mitigation and establishing disaster information systems; activating Indo-Nepal Inundation committee(s); and identifying environment-friendly water-induced disaster mitigation measures and construction methodology.

Department of Soil Conservation and Watershed Management (DSCWM) was established in 1974 in recognition of critical situation of soil erosion and watershed degradation in the country. At present DSCWM is providing SCWM service to 73 out of the 75 districts of Nepal through 61 District Soil Conservation Offices (DSCOs). DSCWM aims to contribute to the livelihood and well-being of the people through sustainable watershed management of the river basins. Its two objectives are to (a) assist in maintaining ecological balance by reducing pressure from natural hazards such as floods, landslides and soil erosion through conservation and development of important watersheds of the country; and (b) maintain land productivity,

reduce soil erosion and contribute to development infrastructure protection by scientific management of watersheds.

Department of Mines and Geology (DMG) operate National Seismological Centre which monitors seismological shocks throughout the country through its network of 21 short period seismic stations and 7 accelerometer stations. Micro-seismic monitoring is a very fast and efficient tool to understand the seismic-tectonics. It is an instrument for seismic surveillance allowing a fast post earthquake rescue operation. For regional and global earthquake location and related seismological studies it provides a valuable database.

Department of Health Services (DHS) manages and maintains Health Management Information Section. Through Epidemiology and Disease Control Division (EDCD) it also looks after epidemic/outbreak surveillance, outbreak preparedness and control programme. The EDCD is also mandated for health sector disaster management programme. The DHS also has GIS system as part of health facility mapping initiative. The DHS has also implementing Health Emergency Operation Centre (HEOC) that functions as a high level operational centre. HEOC hosts necessary resources and data for effective coordination and response during emergencies. During emergency, the centre functions on round-the-clock basis with trained and dedicated staff and equipment.

Department of Survey (DoS) has several technical capacities. It can operate geodetic survey, gravity and other geodetic survey in the country. The DoS also is skillful and equipped with topographical mapping services including map compilation, cartographic processing and updating the topographical base maps of the country. Beside, the DoS has capacity to carry out cadastral survey assessing primarily with land use pattern, the land property mapping, and identifying land types. In addition, it carries out and updates geographic information system (GIS) and develop multi-resolution geo database.

Central Bureau of Statistics (CBS) is the central agency for the collection, consolidation, processing, analysis, publication and dissemination of statistics. It generates timely and reliable socio-economic statistics mainly through the operation of censuses and surveys. It compiles and archives sectoral statistics on population, agriculture and forest, social statistics, environment, poverty and labour, and GIS.

In this backdrop of multiple institutions working in broader and overlapping areas of DMIS on sectoral and standalone basis, it is imperative that a robust system of integrated DMIS be developed, one that is functionally linked to forecasting and early warning. In this endeavour, the following institutions need to collaborate:

§ National Emergency Operation Centre (NEOC), MoHA

- § Department of Hydrology and Meteorology
- § National Seismological Centre / Department of Mines and Geology
- § Department of Health Services
- § Department of Survey, and
- § Central Bureau of Statistics.

Beside this, International Centre for Integrated Mountain Development (ICIMOD) is also active in Nepal as a regional inter-governmental learning and knowledge sharing centre serving the eight regional member countries of the Hindu Kush Himalayas. In close collaboration with the Department of Forests of Nepal, it has developed forest fire detection and monitoring system based on Moderate Resolution Imaging Spectro-radiometer (MODIS) data. The work was supported by the United States Agency for International Development and the National Aeronautics and Space Administration (NASA) under the SERVIR-Himalaya initiative. The system carries out automated data acquisition, processing, and reporting on fire location. It provides location information at 1x1 km resolution on active fires present during the satellite’s twice-daily overpasses.

2.3 Key Hazards of the Years: Assessing Human Casualties and Socio-Economic Losses

The MoHA dataset archives maintain data for a total of 16 kinds of active disasters in Nepal. The disasters noted are, in alphabetic order, *Asinapani* (heavy rainfall with hailstones), avalanche, boat capsized, cold wave, drowning, earthquake, epidemic, fire, flood, heavy rainfall, high altitude, landslide, snow storm, thunderbolt, wind storm, excluding the “other” category. This simple fact well illustrates that Nepal is exposed to multiple hazards at a time (Annex 1).

The 2010 Nepal Hazard Risk Assessment (ADPC, NGI and CECI 2010) identifies 13 districts of Nepal, out of 75 districts in total, exposed to four types of hazards, while other three districts exposed to as many as five types of hazards. The remaining 59 districts are categorized as the ones exposed to three types of hazards. This finding corroborates our observation on Nepal’s exposure to multi hazard vulnerability.

Box 2.1: Key hazards of the years

Overall (1971-2016)	Review years (2015 and 2016)
Earthquake	Earthquake
Epidemic	Fire
Fire	Flood
Flood	Landslide
Landslide	Thunderbolt

By analyzing three categories of national level disaster data on loss (namely, human casualties, financial loss and the number of family affected), our own assessment further reveals that flood, earthquake, landslide, fire and lightning, in order of intensity and effect, are the top five deadly disasters in Nepal for the review period (2015-2016) (see Box 2.1).

According to the MoHA dataset, during the period of two years under review (2015 and 2016), a total of 16 types of disasters have been noted and 13 types of disaster have been recorded. As Table 2.1 displays, a total of 2,940 events of disaster have been recorded, of which incidents of fire are highest (N=1,856), followed by incidents of lightning (N=299), landslide (N=290), flood (N=244) and heavy rainfall (N=118). Other disasters also took place but less in frequency (by two digits or even less).

Table 2.1: Aggregate disaster data (2015 and 2016) by human loss and injuries				
Types of disaster	Number of events	Human loss		
		Death	Missing	Injured
Boat capsize	4	7	1	8
Earthquake (local magnitude 4>)	35*	8,970**	195	22,302
Epidemic	5	20	0	35
Fire	1,856	104	0	278
Flood	244	101	39	23
Landslide	290	276	42	226
Heavy rainfall	118	9	0	24
Wind storm	43	2	0	9
Lightning	299	185	0	369
<i>Asinapani</i>	16	0	0	0
Drowning	5	5	3	0
High altitude	10	13	0	0
Other	15	6	1	43
Total	2,940	9,698	281	23,317
Source: MoHA 2017				
Note:				
* Source Madhav Uprety, National Seismological Centre, as reconfirmed on 20 September 2017 by NEOC.				
**MoHA 2016, p. 58				

In terms of human loss, earthquake, fire, flood, landslide and thunderbolt cause higher human suffering in the country.

Human Casualties: Of these killer hazards, earthquake stands out from the rest in all respects – death, disappearance as well as human injuries. This is evidently due to the 2015 Earthquake. Of the total 9,708 human deaths, earthquake alone claimed the lives of a total of 8,970 persons (92.5 percent). After earthquakes, landslide, lightning, fire and flood claimed the lives most (in a range between 101 and 276 each) in those two years. Note that over the years thunderbolt is becoming one of the killer disasters in Nepal.

Earthquake appears on top also on matter of number of persons missing. Of the total number of missing persons (N=281) in those two years, 195 (69.4 percent) were missing due alone to earthquake. Other two predictable and routine hazards for Nepal, flood and landslide, also resulted into missing, but far less in number.

A total of 22,302 persons sustained injuries in 2015 due alone to earthquake. This is 95.6 percent of the total persons injured (N=23,317). Injuries caused by other hazards are far less. But again, lightning follows it. A total of 369 persons were injured by lightning during the review period. This is followed by fire and landslide claiming injuries more (Table 2.1).

Socio-Economic Losses: When one looks at the impacts of disasters on economic and financial loss, earthquake clearly stands out in all respects. This includes houses damaged, economic loss and number of families affected (Table 2.2).

All disasters recorded in MoHA database reveal that a total of one million, eighty-five thousand, seven hundred and ninety-seven houses were damaged during the review period, of which 98.7 percent of the houses damaged was caused by earthquake. This is followed by a host of other disasters attributable to fire and landslide (0.3 percent) and to flood, heavy rainfall and windstorm (0.2 percent) (Table 2.2).

Of the total more than seven hundred nine billion rupees of economic loss during the review period (2015 and 2016), about 99.5 percent was due to earthquake alone. Another category of disaster that caused economic loss the second most is fire. But its effect was far less (0.3 percent) compared to the effect of earthquake.

Unfortunately, the data related to the losses of old heritage sites in the country is very blurred. Even in the case of 2015 earthquake, the impact to the old temples, monasteries and other old historical infrastructures from rural areas of the country are almost unavailable. Moreover, due to the lack of proper and regular maintenance such old infrastructures in many urban and rural areas have been either damaged or have ultimately collapsed.

Several villages/ communities have been displaced due to regular hit by disasters in mountain and hill areas of Nepal. Such displaced people either shift to other parts of the same districts or to the flat plain of Tarai Nepal. Due to such displacement or migration to the new locations many community groups lose their indigenous informal institutions and also the indigenous knowledge and practices.

Table 2.2: Aggregate disaster data on economic and financial loss (2015 and 2016)

Type of disaster	Number of events	Economic and financial loss		
		Houses damaged	Economic loss (in Rs.)*	Families affected
Boat capsize	4	0	0	8
Earthquake	70	1,072,093	706,461,000,000	1,072,093
Epidemic	5	0	0	20
Fire	1,856	2,997	2,420,480,490	3,898
Flood	244	2,628	47,296,501	7,141
Landslide	290	2,980	811,084,600	1,936
Heavy rainfall	118	2,486	18,969,500	683
Wind storm	43	2,547	24,186,000	191
Lightning	299	65	5,271,000	415
Drowning	5	0	0	7
High altitude	10	0	0	9
Others	15	1	0	19
Total	2,975	1,085,797	709,788,288,091	1,086,420

Source: MoHA 2017, NPC 2015

Note:

* Economic loss from earthquake has been added from 2015 Earthquake as published in PDNA report (NPC 2015).

A total of one million, eighty-six thousand, four hundred and twenty families were affected by one or more disasters during the review period. The MoHA database shows that one million, seventy-two thousand and ninety-three (98.7 percent) families were affected by the earthquake. This is followed by flood and fire, affecting 0.7 and 0.4 percent of the total affected families. To conclude, earthquake, flood and fire are the three disasters that affect a large number of families in Nepal.

The 2017 Monsoon Flood- Beginning Friday, 11 August 2017 Nepal experienced its worst rains in 15 years, resulting in large scale impacts on life, livelihood and infrastructure across 35 of Nepal's 75 districts.⁴ This emergency came at a time when Nepal was already struggling to recover from the 2015 earthquake, with much reconstruction and recovery work still to be done. Five of the current flood affected districts are also earthquake affected districts, while four of the current flood affected districts were affected by large scale floods in 2014, and are yet to fully recover (UN ORC 2017).

⁴ The districts affected by 2017 flood are: Panchthar, Illam, Jhapa, Morang, Sunsari, Saptari, Siraha, Dhanusa, Mahottari, Sarlahi, Rautahat, Bara, Parsa, Chitwan, Makwanpur, Lalitpur, Sindhuli, Nawalparasi, Palpa, Kapilvastu, Dang, Banke, Bardiya, Kailali, Surkhet, Salyan and Kalikot.

The death toll from floods and landslides across the country during the monsoon reached 160. At least 29 people have been missing and 45 others were injured, according to MoHA.⁵ Around 80 percent of the land in flood-affected Tarai districts have been inundated (see Figure 2.3) and the floods triggered by torrential rainfall have destroyed thousands of houses and left scores of people injured. The government has started distributing Rs 200,000 each to the next of kin of those deceased in the disaster and Rs 10,000 each to family whose house has been destroyed. The Government has deployed over 26,000 human resources, including the security personnel, for search and rescue operations. Seven choppers of the Nepal Army and six helicopters of private companies along with rubber boats and motor boats have been mobilized in the flood-



hit areas.

Figure 2.3: People left stranded after floods in Rapti River swept a bridge away in Duduwa, Banke. (Photo credit: Thakur Singh Tharu, *The Kathmandu Post*, 16 August 2017)

⁵ According to MoHA, 43,400 houses were destroyed, 191,700 houses were partially damaged and further 20,900 families were temporarily displaced.

2.4 Environmental Impacts of Disasters

The *Guidelines for Rapid Environmental Impact in Disasters* (Benfield Hazard Research Centre, University College London and CARE International 2005) and Field Environment Assessment Tool (FEAT) developed by UN agencies provides a comprehensive description of the rapid environmental assessment process together with background information on key tasks needed to complete the assessment. It asks for looking in to factors influencing environmental impacts, environmental threats of disasters, unmet basic needs, and negative environmental consequences. The Post Disaster Needs Assessment published by National Planning Commission observed that:

Large landslides, mudflows and other large-scale dislocation of hillsides inflicted damage in forest areas. There was sustained damage to nature tourism infrastructure such as nature trails, trekking routes and sites in protected areas (PAs). Damage to Renewable Energy Technology (RET) solutions such as improved cook stoves (ICS) and biogas are paramount as these lead to improvements in the lives of rural communities and also lead to significant positive environmental outcomes (e.g. reduced deforestation; reductions in GHG emissions) (NPC 2015, vol. A: Key Findings, p. 53).

Immediately after the 2015 Earthquake, Ministry of Science, Technology and the Environment commissioned a rapid environmental assessment of the 2015 Earthquake (MoTSE 2015). The assessment found that the earthquake triggered at least 2,780 landslides and many ground cracks in 31 districts, significantly damaging settlements, infrastructure, agricultural land, forests and water resources. It also identified by satellite imaging that the frequency of landslides was three times greater than that before the earthquake (see Figure 2.4). A large avalanche in Langtang valley destroyed popular trekking destination of Langtang village and flattened nearby forest.

It is mentioned that the moraine dams of three glacial lakes were further destabilized and are now reported to be dangerous. Water sources changed in some areas, with reduced or no flows in some, and new sources starting to flow in others. Freshwater ecosystems in the Koshi and Gandaki basins, as the assessment identified, were affected by increased amounts of sediment, and a few rivers were temporarily blocked by landslides. Risk of downstream flooding is reported to have increased due to deposition of large amounts of sediment.



Figure 2.4: Landslides and soil erosion after the 2015 earthquake
(Source: MoTSE 2014)

The PDNA report estimates that an estimated 2.2 percent of forest cover in the affected areas was lost, mainly pine forest and sub-temperate forest (NPC, 2015, Key Findings).⁶ It will take many years for many sites to stabilize and vegetation to re-establish.

Seven protected areas and their management were severely affected due to the earthquake. Community and government forest governance was disrupted. It posed the risk of increased illegal extraction. Some wild animals are known to have been killed directly by the earthquake (MoTSE 2015). The forest areas in the quake-affected districts are likely to face human pressure and subsequent deforestation in post-earthquake times, as timber and other forests resources will be in high demand to rebuild houses.

⁶ The earthquake damaged forest resources in 31 districts. The losses that occurred in 14 most affected districts are valued at Rs. 63.9 billion. According to an assessment made by the Post Disaster Needs Assessment (PDNA) team, mainly pine forests and sub-temperate types of forests were highly affected (NPC 2015).

Loss of water resources due to landslides triggered by the quake may have created a critical problem in some villages. This adds to the woes of already drying water sources because of climate change. This problem can be the cause of internal migration in many places. Water shortage has become more severe as earthquake-affected districts saw very scanty rainfall last monsoon season.

Box 2.2: Principles of making recovery and reconstruction environmentally sensitive

1. Ensure land use planning incorporates hazards and disaster risk reduction
2. Promote the use of safe and green building materials and reuse of disaster debris
3. Develop environmentally responsible solid and hazardous waste management plans
4. Ensure strategic road planning and reconstruction
5. Promote alternative energy and energy efficiency methods
6. Improve water and sanitation and promote integrated watershed management
7. Support alternative livelihoods and environmentally responsible agriculture
8. Promote reforestation and sustainably sourced timber for reconstruction
9. Promote sound environmental practices through schools and other academic institutions
10. Promote equity in the recovery and reconstruction process with particular attention to women and vulnerable or marginalized groups
11. Incorporate climate change into recovery and reconstruction

(Source: MoSTE 2015, pp. xii-xiv)

A huge amount of debris was generated from damaged buildings. Hazardous waste released into the environment included medical waste that was haphazardly disposed of. Some toxic chemicals will end up in ground water or rivers. Some of them are persistent pollutants. The MoTSE report also notes that waste generated in emergency camps was not well managed, and plastic generated during the relief phase was either burned, causing air pollution, or dumped and will remain in the environment because it does not decompose. Dead bodies and livestock carcasses contaminated the environment. The assessment came up with a set of 11 principles for recovery and reconstruction (see **Box 2.2**).

2.5 Why is Safeguarding Development Gains So Important?

Natural disasters can hit the economy and can rollback development gains or exacerbate inequality. The PDNA (NPC 2015, Executive Summary) reports that the destruction caused by 2015 earthquakes were 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. Overall, it shook the economy.

A macroeconomic impact assessment, part of the PDNA, reveals that “total damage to existing stock of assets has been estimated at over NPR 500 billion, with economic losses that flow from

destruction, estimated at nearly NPR 200 billion – taken together both figures represent an economic force equivalent to about one third of Nepal’s GDP” (NPC 2015, Executive Summary, p. 76). The report concludes that “the earthquake upsets the nation’s high aspirations for swifter economic progress in the short run” shaking the national hope for graduation of the country from its current status as a Least Developed Country (LDC) to developing country, possibly by 2022 (p. 76).

According to the World Bank simulations the earthquake is likely to push an additional 2.5 to 3.5 percent of the population into poverty in fiscal year 2015-16 (NPC 2015, Executive Summary, p. xviii). That means, at least, 700,000 additional people are likely to fall under the poverty line as a direct effect of earthquake.

On top of economic costs of damage and losses, there is also a cost for reconstruction. Revising the PDNA estimation of NPR 669,505 million financing needs for managing reconstruction works of various sectors, the NRA later estimated it to be NPR 837,742 million. Hence, it is very clear that one single disaster can pull the economy down tremendously.

Water-induced disasters, notably floods (in the plains) and landslides (in the hills), associated with the monsoon rains, are the most common natural weather hazards in Nepal. These events lead to the loss of life and cause major damage to property and infrastructure. They also have major impacts on livelihoods, affecting tens to hundreds of thousands of people every year.

A report published by Ministry of Science, Technology and Environment (MoSTE) about the economic impacts of climate change variability shows that the direct cost of impacts of water-induced disaster ranged from US\$270 to 360m per year during a 30 year period (1980-2010) which was 1.5 to 2 percent of the GDP at 2013 value. It may reach to as high as five percent in extreme years; while the indirect cost was as high as 100 percent of the direct impact (MoTSE 2014).

The MoTSE (2014) study assessed historical information on floods and landslides over the last 30 years (1983-2000) and built up an analysis of the economic costs of these events. To provide a more comprehensive analysis, the costs include damage to buildings and infrastructure as well as the economic costs of the events in terms of people’s health and welfare.

The estimated direct economic costs of these historical events have been very large, equivalent to 1.5 percent of current GDP/year on average (approximately US\$270 million in 2013 prices). These include major events from time to time, which have much higher costs. Indeed, in exceptional years (e.g. the floods of 1993) the economic costs of extreme events and variability have been 5 percent of GDP equivalent or more. These events also lead to indirect effects which arise as a consequence – e.g. business disruption, lost wages and macro-economic costs

– from the effects of major disasters on consumption, inflation and the shift of resources to relief and reconstruction. As a broad indication, these issues would increase the costs reported above by 25–100 percent (p. 6).

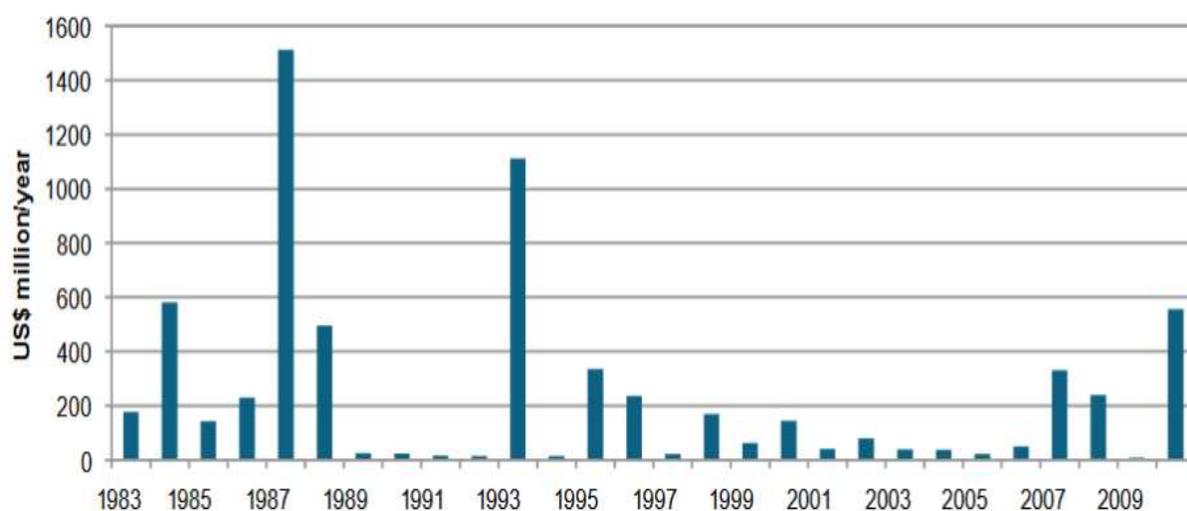


Figure 2.5: Longitudinal pattern of economic costs of water-induced disasters in Nepal, 1983-2010
(Source: MoTSE 2014, Figure 3)

Nepal suffers high economic costs due to current climate variability and climate related hazards. This study provides estimates of the impacts and economic costs of climate change for key risks in Nepal. The economy of Nepal and the livelihoods of its people are very dependent on the climate. A large proportion of the country’s Gross Domestic Product (GDP) is associated with climate-sensitive activities. Current climate variability and extreme events lead to major impacts and economic costs in Nepal. These are dominated by floods, but also include rainfall variability on agriculture (rain-fed agriculture, soil erosion, droughts) and low season river flows reducing hydroelectricity generation. The estimated direct cost of these events is equivalent to 1.5 to 2.0 percent of GDP/year (approximately US\$270–360 million/year in 2013 prices), and is much higher in extreme years, rising to 5 percent or more (MoTSE 2014). This is high by international levels.

Consideration of the additional indirect and macro-economic costs of these impacts could increase current estimates from 25% to 100%. The analysis was complemented with a series of local case studies, which included new field surveys. These studies found that the recent changes in the climate are already leading to impacts on local communities. These are magnifying existing inequalities among groups in society, with distributional differences by area and by gender.

The analysis shows that the direct economic costs of current climate variability in Nepal are very high, even for the three areas considered (agriculture, hydroelectricity, water-induced disasters). These impacts also have a major influence on livelihoods affecting hundreds of thousands of people in extreme years. They lead to high economic costs, estimated at 1.5% to 2% of current GDP equivalent in an average year to approximately US\$270–360 million/year at 2013 prices and as high as 5% in extreme years. These damages are dominated by water-induced disasters. When indirect and macro-economic costs are added, the total costs are likely to be 25% to 100% higher (p. 7).

2.6 Way Forward

The chapter reviews DIMS in Nepal and stock takes human casualties and socio-economic losses from different disasters during the review period, 2015-2016. It shows that the death toll, loss of public and private property, assets and livelihoods are increasing over the years due to disasters in the country. There is also a heavy resource and environmental loss triggered by primary disasters. Keeping in view Nepal's development aspirations of graduating to developing country by the year 2022, there should be effective and concerted efforts on the part of government, nongovernment and private sector.

Disaster prone country like Nepal must be serious to develop, implement and monitor the risk sensitive land use plan for the entire country to sustain its hard core development gains and to reduce future disaster loss and damages. All development plans be at local level or national level must be linked with risk profile of the country. The country need to ensure that the future development will not generate any new disaster threat to the country and its population.

Due to faulty development plans, weak monitoring mechanisms, climate change, poor environmental management, the country is facing growing and multiple challenges posed by multi-hazards and recurrent disasters. The occurrence of forest fire in many hill districts in recent past is growing. Likewise, the threat of GLOF is also alarming. Due to siltation in many river systems the adjoining farmlands are lower in elevation than the river. So even in a normal time many streams and rivers change their course and pass through agricultural land - damaging the fertile farm land.

Many government and development agencies have been designing and implementing community-led disaster risk management activities in many parts of Nepal. In many instances, such initiatives have proved that the community-led initiatives are the more cost effective and sustainable. However, scaling up of such practices to other disaster prone communities is yet to be materialized.

Chapter 3

The 2015 Earthquake and the Lessons Learned

3.1 The 2015 Gorkha Earthquake

Nepal suffered a massive loss of lives and property on Saturday 25 April 2015, when the devastating magnitude 7.6 earthquake struck Nepal. Subsequent aftershocks,⁷ including one with magnitude 7.3 near the Chinese border on 12 May, resulted into additional losses of life and property. The earthquakes shook almost entirely the whole country, and the destruction was extensive, lasting and widespread, in terms of human casualties, social suffering as well as environmental, infrastructural and heritage related damages. The earthquake triggered avalanches on Mount Everest and in the Langtang valley. Villages were flattened and people were made homeless within less than a minute. Considering the severe level of humanitarian crises, Government of Nepal declared 14 out of 31 badly affected districts as “crisis-hit.”

The *Post Disaster Recovery Framework* (NRA 2016) prepared by National Reconstruction Authority and the *Post Disaster Needs Assessment* (NPC 2015) prepared by National Planning Commission accomplished stock taking of damages and losses and estimated recovery costs together with an outline of reconstruction strategy.

As a result of the earthquake, 8,970 people died and more than 22,302 people were injured (MoHA 2016). The PDNA showed that at least 498,852 private houses and 2,656 government buildings were destroyed. Another 256,697 private houses and 3,622 government buildings were partially damaged. In addition, 19,000 classrooms were destroyed and 11,000 damaged (NPC 2015).⁸

The earthquake affected manufacturing, production and trade in agriculture as well as tourism and other areas of the service sector. On the whole, it weakened the national economy with wider ramifications. It posed challenge to Nepal’s aspiration of upgrading herself to developing country category by 2022, and to national commitment of poverty reduction from 23.8 percent to 18 percent NPC (2016).

⁷ According to National Seismological Centre the major two earthquakes were followed by 486 aftershocks with local magnitude 4 and over until 24 August 2017.

According to initial estimates arrived at during the Post Disaster Needs Assessment (PDNA), NPR 669 billion would be required to reconstruct damaged properties and infrastructure and to support recovery in affected sectors of the economy. A revised estimate drawn as part of developing the Post Disaster Recovery Framework identified USD 9.3 billion needed for reconstruction.

3.2 Experiences from the Relief Operation

Relief operation started from the very second hour of the earthquake and lasted till 19 May 2015. Hence, relief operation lasted for about little less than a month. Key highlights of relief operation are drawn hereunder.

Quick and Swift Initial Response-This has been widely observed that Government of Nepal remained quick and swift during initial phase of search, rescue and relief response. The first meeting of the Central Disaster Relief Committee (CNDRC) took place at NEOC within first two hours of the tremor, and the first emergency meeting of the Cabinet took place within first four hours. These meetings managed to (a) immediately release NRs five hundred million at the dispense of CNDRC, (b) call for international humanitarian support, and (c) declare emergency in 11 “crisis-hit” districts (MoHA, 2016),⁹ among other decisions. Certain institutional and policy frameworks put in place earlier enabled to this quick initial response. The role of NEOC and the National Disaster Response Framework (NDRF), 2013 assigning clear and time-based roles and responsibilities are cases in point.

On the third day of earthquake, the Government managed additional buses to support outbound passengers who wished to leave the ravaged Kathmandu and to join their families in outside districts. In a week followed, about one hundred thousand people left Kathmandu that relieved pressures on emergency response to a great extent.

Breakdown and Revival of Communication and Information Networks- For a coordinated and informed response smooth functioning of communication system is evident. Getting loss and damage information and disseminating clear instructions are one of key priority actions in this period. Nepal’s communication infrastructure crumbled down immediately with the 2015 earthquake both literally and figuratively (EIAS 2016). Mobile networks, landline telephones, means of mass communication (such as television) were all paralyzed. This had implication on mobilization and optimum utilization of international responders who entered the country without knowing where their assistance was most needed. The Government established toll free call centers (with number 1234) as an alternative way to allow people to convey their messages to government, which received a total of 69,890 calls seeking supports. Alternatively,

⁹ Emergency was later imposed on additional three districts after getting detailed report.

Government also tried maintaining alternative ways of information flow of relief and rescue through *Nepal DRR Portal* (see <http://drrportal.gov.np/>).

Alternatively, SMS and Twitter facilities were put in place which complemented flows of information to some extent. As means of communication (such as internet) were revived, it added much value. International communication companies, namely T-Mobile, Sprint, Verizon, Vodafone, Time Warner Cables and others, offered free calls from and to Nepal. Payment providers such as Apple, PayPal and Square Cash waived their fees to ease the donations process. Google and Facebook enabled useful tools to help search for missing and displaced persons (EIAS 2016). The lesson learned is that Nepal should invest much in making communication and information system resilient.

Cash Compensation to the Affected Families- On the fifth day of the earthquake, the Government made a number of decisions on relief. Families who lost family members would be compensated with NRs one hundred thousand each. The bereaved family would also get NRs 40,000 for funeral costs. Those whose houses were damaged would get NRs 15,000 for repair work. Those whose house had collapsed would get NRs 5,000 for managing immediate shelter (NRs. 3,000 for ones whose house is only damaged). To manage foods for immediate consumption, each affected family would get NRs 2,000. When the reconstruction intervention was delayed due to bureaucratic and political inefficiencies, in view of upcoming winter, the Government also decided to provide every affected family NRs 25,000, as advance, for managing temporary shelter and NRs. 10,000 to manage “warm clothes” like rugs and blankets. While all this diverse range of relief was essential, there was debate whether cash transfer such as this was the best mode of immediate humanitarian support, or there were better alternatives.

Troubles in Identification of Needs and Managing Supplies of Relief Materials and Services- In the mess of post-disaster context, if institutional memories are not strong and if standard operating procedures are not put in place, proper identification of relief materials needed on the ground level becomes a challenge. In addition, the list of necessary relief items needs to be constantly updated as the needs keep on changing as the days pass by. The 2015 Earthquake repeated the same frustrating experience. Senior Government officers deputed in Central Command Post at NEOC found it difficult (for lack of proper information or difficulty in compiling and prioritizing the needs) to decide what and where to dispatch the piles of relief materials. Later Government decided to depute a team of senior government officers (from three different ministries led by MoHA) in the emergency warehouse at Tribhuvan International Airport itself. To address the problem of mismatch between the relief items in need on the ground and the supply of donations of such items, the CNDRC on 30 April 2015 instructed secretaries of the MoHA, Ministry of Commerce and Supply, Ministry of Industry, Ministry of

Agriculture Development, Ministry of Finance and the Ministry of Urban Development to sit together to identify and finalize the list of items in need, subject to be endorsed by CNDRRC, to finally disseminate the information widely to national and international donors and volunteers.¹⁰

Distributing relief materials to rural areas remained particularly a challenging task given the perennial problems of rugged topography, remote country sides still remaining as inaccessible, poor road networks and transportation facilities. Although, by and large, the situation remained calm, few incidences of looting and capturing of dispatched materials on the way were reported (EIAS 2016). To ensure supply of relief materials with safety and delivery in designated points, Government later decided to air lift relief supplies by Nepal Army and overland transportation either by Nepal Army and the Armed Police Force (MoHA 2016).

Keeping in view that donors, international development partners and domestic volunteer groups had also begun to distribute relief materials on their own way and that it had created problem of duplication and road-side bias, the Government decided to “route earthquake donations through the bank account of the Prime Minister’s Disaster Relief Fund, trying to provide a one-window service to the affected people by consolidating amounts, avoiding duplication of effort and ensuring proportional and equitable access to relief by needy victims in all areas.” International development partners, however, lacked trust on the government (EIAS 2016), and some of them circumvented the government decision and sent aid directly through NGOs for distribution (MoHA 2015). There are several lessons learned.

Command and Coordination Mechanism- As with all major disasters, the 2015 Earthquake became a test case for the Government coordination mechanism at various levels. Although CNDRRC remained active and functional throughout, experience shows that, in terms of effect, it remained less pronounced compared to the urgency of the circumstance. On the one hand, there was a tier of command, control and coordination mechanism, there was also a parallel entity created for oversight and monitoring primarily comprised of political representation on the other.

The Central Command Post was established at MoHA under the leadership of MoHA Secretary, drawing secretaries of other nine relevant ministries (MoHA 2015, p. 7). It was the apex operational unit. There was also one SAR Command Post under the command of MoHA Joint Secretary drawing in the team of senior officials from Nepal Army, Nepal Police and Armed

¹⁰ The Government also deputed a team in each Customs Offices other than TIA, comprising Local Development Officer, chiefs of district security forces, chief of the respective Customs Office, and led by Chief District Officer of the respective district, as the Relief Materials Screening Committee mandated with screening and approving relief materials imported that are duty-free and maintaining record of all the items received and informing CNDRRC quickly (MoHA 2016, pp. 231-232).

Police Force. About 66,069 armies, 41,776 police personnel, and 24,775 APF personnel were mobilized under SAR Command Post. As mentioned earlier, a team of senior government officers (from three different ministries led by MoHA) was deputed in the emergency warehouse at Tribhuvan International Airport to coordinate on-the-spot about supply, distribution and delivery of relief materials.

At the District level, DDRCs were active as per the mandate. To support in their task, one Joint Secretary was deputed in each affected district supervised directly by a designated Secretary from Kathmandu to coordinate. In addition, in each electoral area of the earthquake affected districts, one Joint Secretary was sent from Kathmandu to head a team comprising representatives of Nepal Army, Nepal Police and Armed Police Force to look after issues of debris management, corpse management, and distribution of relief materials and take preventive measures to control outbreak of epidemic. This team would work under the coordination of Joint Secretary deputed at District Headquarters. This mechanism is yet to be assessed in terms of their effectiveness, overlaps of responsibility and conflict of interest with DDRCs.

3.3 Experiences from the Ongoing Recovery and Reconstruction

From 19 May 2015, the Government of Nepal began a transition from relief operation to the recovery phase. Some of the salient issues of recovery phase have been drawn hereunder.

Establishment of National Reconstruction Authority- The National Reconstruction Authority (NRA), a coordinating and facilitating body formed by the Government of Nepal to manage, oversee and coordinate the reconstruction work was constituted on 25 December 2015, following the enactment of the NRA Act on 20 December. By law, its functions include assessing the damages caused by the earthquake and its aftershocks, fixing the priorities of reconstruction, preparing policies, plans and programs, and facilitating implementation. It can carry out reconstruction, or ensure that it is done through different agencies, obtain land for reconstruction, and prepare plans for developing integrated settlements for ensuring that reconstruction is carried out in the prescribed manner, in accordance with established safety standards.

The NRA is also responsible for coordinating the work of, and collaborating with, non-governmental organizations, private sector or communities as they relate to reconstruction. It is also empowered to raise financial resources for reconstruction and to make arrangements for effective use. The Authority is responsible of carrying out technical reviews of damaged or unsafe physical structures and order safe demolition, where required. For all practical purposes, it is the one-stop institution to oversee, coordinate, and facilitate Nepal's effort to build back better – that underpins the reconstruction policy.

The NRA is the legally mandated agency for leading and managing the earthquake recovery and reconstruction in Nepal. NRA provides strategic guidance to identify and address to the priorities for recovery and reconstruction, taking into account both urgent needs as well as those of a medium to long term nature.

The NRA's overall goal is to promptly complete the reconstruction works of the structures damaged by the earthquake, in a sustainable, resilient and planned manner to promote national interest and provide social justice by making resettlement and translocation of the persons and families displaced by the earthquake (adapted from the NRA Act).

The objectives of the NRA as articulated in the National Reconstruction Policy, among other, are to reconstruct, retrofit and restore partially and completely damaged residential, community and government buildings and heritage sites, to make them disaster resistant using local technologies as needed; and to reconstruct (restore) damaged cities and ancient villages to their original form, while improving the resilience of the structures.

Formulation of Post Disaster Recovery Framework (PDRF)- In May 2016, the NRA brought a new *Post Disaster Recovery Framework* (PDRF) (NRA 2016). The PDRF lays out strategic recovery objectives and summarizes in an integrated manner the policy decisions, institutional arrangements, financing and financial management strategies, as well as implementation and monitoring systems that are being put in place to plan and manage recovery and reconstruction. It also sets out sector priorities that will contribute to the achievement of the strategic recovery objectives. Under the recovery vision of "establishment of well-planned, resilient settlements and a prosperous society," the PDRF sets out five Strategic Recovery Objectives, as follows:

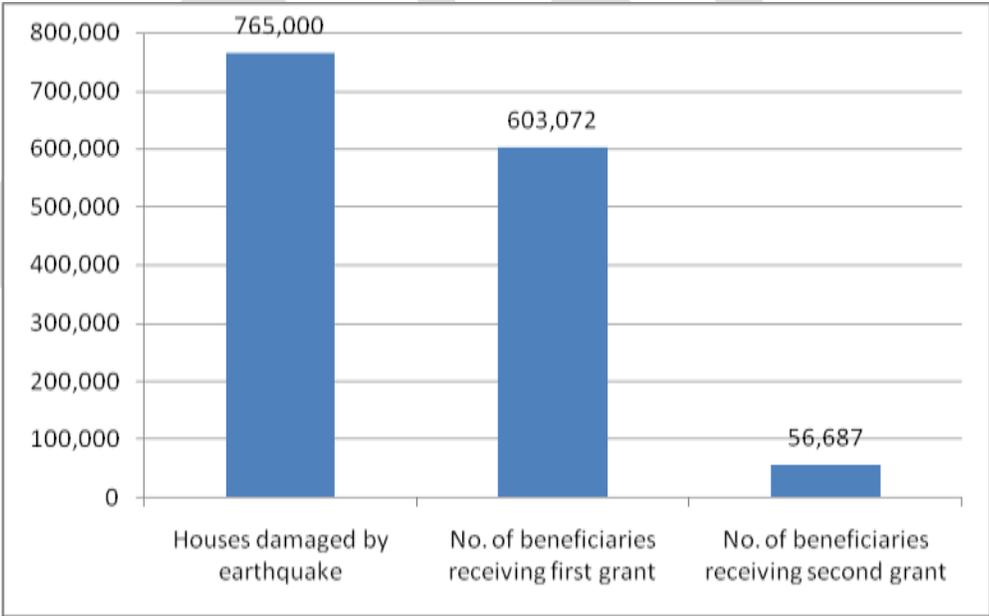
- a) Restore and improve disaster resilient housing, government buildings and cultural heritage, in rural areas and cities.
- b) Strengthen the capacity of people and communities to reduce their risk and vulnerability and to enhance social cohesion.
- c) Restore and improve access to services and improve environmental resilience.
- d) Develop and restore economic opportunities and livelihoods and re-establish productive sectors.
- e) Strengthen capacity and effectiveness of the state to respond to the people's needs and to effectively recover from future disasters.

The key elements of the National Reconstruction and Rehabilitation Policy are: (a) Reconstruction of housing and cultural heritage sites following a standard approach of owner-

driven housing reconstruction. (b) Relocation and land use although there is emphasis that most reconstruction will take place in-situ. Relocation of villages will be discouraged. The policy will address pooling and developing land, discouraging scattered settlements and promoting larger and integrated settlements. (c) Engaging the community (including affected vulnerable social groups, women, children, people with disabilities and senior citizens), private sector, volunteers and Diasporas in reconstruction. (d) Integrating principles of disaster risk reduction and build back better, for which use of local building materials is encouraged and safer designs and stronger infrastructure specifications will be put in place. (e) Providing financial assistance for housing recovery to be linked to the progress of construction.

Private House Reconstruction- Private house reconstruction is NRA’s one of top priority areas. In two years after the devastating earthquake that destroyed over 765,000 houses, reconstruction of private houses has gathered pace. As of August 2017, 632,047 beneficiaries have signed for the grant agreement and 603,072 of them have collected the first tranche whereas only 56,687 beneficiaries have received the second (see Figure 3.1). Similarly, NRA’s focus is continuous strengthening of executing and implementation agencies, also special priority is given to build schools, health centers and public infrastructures.

Figure 3.1: Ratio of beneficiaries receiving house reconstruction grants in 14 crisis-hit districts (Source: NRA 2017)



This fiscal year 2017-18 is seen as the year of reconstruction, targets are to complete the reconstruction of private households and public infrastructures within the specified timeframe. To speed up the grant distribution procedures, the Authority has disbursed second and third

installment in advance at the local level. The work target of NRA for this fiscal year is enlisted below:

- Devolution and allocation of reconstruction work among the newly elected local representatives in respective districts.
- To speed up the grant distribution process, necessary technical assistance will be disbursed in affected districts.
- Required technical and economic support will be provided to shift the vulnerable settlements to safer locations.
- Several programs on livelihoods will be continued, including agriculture, animal husbandry, irrigation etc.
- NRs. 50,000 additional grant or technical support (or both) to build earthquake resilient houses in compliance with the prescribed standards to single women, Dalits, elderly and differently able-person.

Relocation of Hazard-Risk Settlements- NRA has enforced a new procedure to make necessary arrangements for the beneficiaries and families of the hazard-prone settlements that have been affected by the earthquakes. The “Procedures for the Relocation and Rehabilitation of Hazard-prone Settlements, 2073 (2017)” has been enforced from 7 April 2017 as per the authority provided by Clause 31 of the “Reconstruction and Rehabilitation of Structures Affected by the Earthquakes Act, 2072”. As per the new procedure, “hazard-prone settlement” refers to “...settlements or families residing in [areas] ... identified as hazard-prone” by NRA based on official geological reports (NRA 2017a). A study conducted by NRA to identify vulnerable settlements after the 2015 earthquake recommended that a total of 2,751 families of 112 communities have to be relocated to safer places (NRA 2017b).

In such a case, the beneficiaries will be encouraged to create users’ groups involving at least 10 families in each settlement so that the committee can select a safe location for the development of integrated settlement. Similarly, beneficiaries are required to submit the land purchase certificate to NRA authorized offices.

The beneficiaries who wish to be relocated in an integrated settlement, the lands shall be integrated and the relocation and rehabilitation plan prepared after which separate programs shall be implemented to gradually develop structures (NRA 2017c). The procedure also mentions about gradual establishment of basic-needs structures like roads, drinking water supply, electricity, health centers and educational institutions for the integrated settlement based on agreements at the local level.

3.4 Volunteerism During and After the 2015 Earthquake

Spontaneous, self-motivated volunteerism particularly by young people spread during and after the 2015 earthquake across the hard-hit districts. In this section we present an account of the one seen in Kaski district, where people found that restoring schools as one of the best immediate ways to bring people's life back to normalcy.

On 26 April 2015 (next day of the earthquake), both government officials (Regional Administrator, Chief District Officer, Chief Regional Police Office) and representatives of civil society, media representative and youth and women volunteers met together and decided to support government relief and rescue operation in a coordinated manner. One of the major decisions was to form "Citizen Support Committee for Disaster Management" (CSCDM) under the leadership of Mr. Bishnu Bahadur Bhattarai. To coordinate properly the CSCDM formed four sub-committees: impact assessment, volunteer coordination, relief management, and monitoring and evaluation. The sub-committees organized wider consultations with local political leaders, business houses, students, community level organizations, etc. and shared their plan for immediate relief and response, working modality, reporting mechanism and fund generation. Here, we are highlighting the activities designed and implemented by Youth Volunteers Coordination Sub-Committee (YVCsc).

Process- In a week, the YVCsc organized a meeting with all like-minded volunteer clubs/ organizations working in the district in the presence of the Chief District Officer, District Education Office Chief, head masters of affected schools and Local Development Officer, and decided to immediately construct temporary class rooms in all damaged schools.

Based on the assessment report provided by the Impact Assessment Sub-Committee, the YVCs, immediately deployed four members team to assess the damages of school class rooms and explore possibility to use locally available materials for the construction of temporary class rooms. In the mean time, the YVCsc also met with the engineers working with District Education Office, District Development Committee and other education related organizations and discussed about the use of local materials especially bamboo for the construction of temporary class rooms and possible designs.

Achievements- On the basis of the assessment reports and design of the temporary class room, the YVCsc shared their plan to construct temporary class rooms, locations and design with all stakeholders both government and non-government and mobilized youths immediately to

initiate the construction of temporary class rooms. The agreed design of the temporary class room will be made of bamboo, bamboo net roof with tarpaulin at the top and separation of class with bamboo net.

Within two weeks of the April 2015 earthquake, the YVCsc commenced construction of temporary class rooms in close partnership with local school teachers, parents and students. Within three weeks from the date of first earthquake of April 2015, 50% of the target of the construction of temporary class rooms were achieved and class were resumed at the school level. Within three weeks (all school operated from 3 Jetha 2072) from the date of its commencement (started construction from 25thBaishakh 2072), 106 temporary class rooms of 32 schools of Kaski districts were completed and classes were resumed in all schools damaged by April 2015 earthquakes in Kaski districts. Total 750 volunteers from 45 organizations were mobilized under YVCsc. Now, all these temporary class rooms have been replaced by new permanent class rooms/ building.

The entire construction of these 106 class rooms, transportation of construction materials to sites, logistics of the volunteers were made by fund generated locally and in many cases managed by volunteers themselves. The YVCsc never requested any donors to provide them fund, rather people and organizations supported them willingly.

After constructing 106 class rooms, some of these volunteers were mobilized to neighboring districts for similar initiatives. With this, the Youths in Kaski proved that if responsibilities are given to them, they can perform any emergency activities in a very coordinated manner without any political, personal or financial interests.

3.5 Key Lessons Learned

Lessons Learned during the Relief Phase- Despite quick and swift initial response on the part of the Government, as time progressed, coordination and command issues became increasingly challenging. A huge influx of international humanitarian teams and the government coordination mechanism trying to come out of the learning posed a paradox. Some of the lessons learned can be summed up as follows.

- Establishment of NEOC and EOCs network proved to be quite effective, particularly in the event of breakdown of communications system. It also served as the backbone of the main line of command and control.
- The NDRF developed 2013 was implemented for the first time in 2015 Earthquake. This proved to be quite instrumental, despite the realization that it needs to be revised based on the lessons learned.

- The coordination mechanism envisaged by Natural Calamity Relief Act, 1982 proved to be exhausted. The Government of Nepal, driven by circumstances, took one decision after another on matter of effective coordination and oversight. This has to be reviewed and an appropriate and robust coordination framework has to be legally instituted.
- There should be a legally-binding and effective “one window framework” put in place beforehand, yet it should not undermine the sense of voluntarism and spontaneous humanitarian support initiatives. Trust, transparency and recognition of contribution have to be ensured. One window framework was understood differently. We suggest that Government should endorse a guideline for this.
- An integrated but a separate national body of INSARAG-standard SAR needs to be immediately instituted drawing human resources from NA, NP and APF.
- A robust, well tested and resilient information and communication system (DIMS) has to be maintained, and use of information and communication technology, social media and apps needs to be promoted that can be of use during and after emergency.
- Arrival of international humanitarian response team should be needs-based and smaller in size so that they do not create extra pressure on coordination and domestic SAR capacities are not undermined.
- A final lesson learned that we note here is that due to varied level of understanding of the local DRR entities such as the DDRCs, there was also variation in effectiveness of institutional capacity to respond.

Lesson Learned from Recovery Phase- Despite good intentions, recovery and reconstruction have been very slow. Though unacceptable, the reconstruction process has been an Endeavour of trial and error and is stuck in political and legislative delays and conflict of interests, admits one CEO of NRA (NRA 2017b, p. 2).

- Management and mobilization of competent human resources is a major stumbling block. There is a need to produce and mobilize adequate human resources.
- Coordination, collaboration and cooperation among governmental, non-governmental, private sectors, and the affected community is a challenge. Our observation shows that DDRCs are grossly bypassed in reconstruction process. DDRCs are better experienced in local level coordination and facilitation.

- The PDRF identified the need of USD 9.3 billion for reconstruction. So far the pledged amount from international development partners stands at USD 4.3 billion. There is an evident resource gap (46.2 percent) to accomplish the task of complete reconstruction.
- Not only is there a resource gap, there is also a capacity gap of NRA in implementation. An overview of NRA's expenditure portfolio shows that a considerable size of capital fund has remained unspent over the last two consecutive financial years.
- Another, very clear lesson learned is that the provision of district lead support agencies (DLSA) did not prove to be that effective if they are INGOs. We observe that local NGOs and NRCS district chapters are better versed in coordination, joint discussion and facilitation.
- Despite a number of policy frameworks already in place before 2015 Earthquake, and additional policy documents developed for and by NRA (see Box 3.1), there is still a need to put in place a set of standard guidelines, operating procedures and systems, including strict implementation of building codes.
- Nepal's post-earthquake reconstruction did not succeed to maintain the pace in building private houses also because first there was a dearth of trained engineers willing to work in earthquake-hit districts. If they were willing to work in and deputed to earthquake hit areas, the NRA gave them the role of certifying eligibility to get next installment of payment instead of the engineers facilitating the re-construction process.

Box 3.1: Reconstruction related policy and legal frameworks

- Reconstruction and Rehabilitation Related Policy, 2072
- Reconstruction and Rehabilitation Guidelines, 2072
- Private Housing Grant Distribution Procedure, 2072
- Environmental Impact Assessment Related Procedure, 2072
- Land Acquisition Related Procedures, 2072
- Land Registration Related Procedures, 2072
- Public Procurement Related Procedures, 2072
- Mobilization of NGO Sectors Related Procedures, 2072
- Post Disaster Recovery Framework, 2073
- Grievances Hearing Procedure, 2073
- Reconstruction Fund Mobilization Related Procedure, 2073
- Community Rebuilding Committee Related Procedure, 2073
- Private Housing Reconstruction Technical Inspection, 2073
- Training Procedure, 2073
- Training Strategies, 2073
- Reconstruction of Schools Procedure, 2073

(Source: NRA 2017b, p. 7)

3.6 Way Forward

In this chapter we assessed the 2015 Gorkha Earthquake in terms of its devastation. We drew a number of critical issues during the phase of relief operation and from the ongoing recovery and reconstruction phase. We also presented a case of self-motivated, spontaneous mobilization of youths in rebuilding in the immediate aftermath of the earthquake. Thereafter,

we also presented a case drawn from Kaski District. Then we drew a number of lesson learned for our future endeavor.

First and foremost, despite a quick and swift initial relief operation, traditional and regular coordination mechanism did not work. Although CNDRRC, supported much by NEOF, seems to be taking timely decisions, its downward implementation did not take momentum. DDRCs could not remain functional at the same pace across the crisis-hit districts. Driven by circumstance, the government took one decision after another to make coordination functional. There are so many lessons learned – which need to be documented, field verified and translated into policy and institutional reform.

One meta-conclusion that can be drawn from the post-disaster recovery and reconstruction is that it largely failed to keep the momentum (Pokharel, 2017). Political and bureaucratic interest in the establishment of NRA, appointment and reappointment of CEOs and the losing momentum in delivery to the earthquake-devastated families and communities largely present a gloomy picture. The cash transfer to rebuild private houses in a poor country like Nepal – an agenda pushed hard by international development partners – also demands a critical review. With a number of policy and institutional frameworks already formulated, time has now come to entrust the task of decentralized reconstruction to newly elected local bodies (Pokharel 2017) as swiftly as possible.

One of the major challenges for the government during relief phase was that it could not effectively implement what was called “one window framework” of relief materials. While cash contribution was requested to go through the Prime Ministerial Disaster Fund, contribution in kind was requested to be distributed in coordination with DDRCs. There was mistrust over government mechanism over alleged corruption, and the government on its part rightfully insisted on “one window framework.” Our observation tells us that “one window framework” was, in fact, misunderstood by government entities themselves (DDRCs, for example) and also by international development partners (DFID, for example). Government of Nepal, in fact, needs to develop a legally binding guideline, endorse it and make it public beforehand in case of future disasters.

Chapter 4

DRM Regulatory Frameworks in Nepal

4.1 The Constitution of Nepal, 2015

Nepal’s current constitution mentions disaster risk management in the country for the first time and it has clearly assigned DRM as a concurrent responsibility of different tiers of governments, particularly the local governments. Article 51 stipulates the policies to be pursued by the state. The sub-article G that relates to “policies relating to protection, promotion and use of natural resources,” mentions that the state shall formulate policies on development of sustainable and reliable irrigation by controlling water-induced disasters and expediting river management.

Article 51(G) (9) of the Constitution states that the State shall pursue policies relating to, among several other issues, protection, promotion and use of natural resources. Sub-article 51(G)9 also allows Government to make policies related to “advance warning, preparedness, rescue, relief and rehabilitation in order to mitigate risks from natural disasters.” Further, Article 267 of the Constitution gives the Government rights to mobilize Nepal Army in DRM. The Constitution says, “The Government of Nepal may also mobilize the Nepal Army in, among other things, the disaster management works, as provided for in the Federal law.”

Article 273 of the Constitution gives the President several emergency powers. Article 273 (2) says, “if there arises a grave emergency in a State because of a natural calamity or epidemic, the concerned state government may request the Government of Nepal to declare a state of emergency in respect of the whole of the State or of any specified part thereof.”

Table 4.1: Constitutional provision of assigning responsibility on matter of DRM

Schedule No.	Subject of schedule	Provision
5	Federal Powers/Jurisdiction	Land use policy, housing development policy, tourism policy, environment adaptation (#29)
6	Provincial Powers/Jurisdiction	--
7	Concurrent (federal and provincial) Powers/Jurisdiction	Natural and man-made disaster preparedness, rescue, relief and rehabilitation (#17)
8	Powers/Jurisdiction for Local Level	Disaster management (#20)
9	Concurrent Powers/Jurisdiction for Federation, Province and Local Level	Disaster management (#9)

Source: Constitution of Nepal 2015.

Constitution of Nepal has clearly stipulated that DRM is a shared responsibility of all levels of governments (Table 4.1). While subjects on federal and provincial power are silent on DRM (with one provision of land use policy, housing development policy, tourism policy, and environment adaptation – remotely related to DRM assigned as federal power), the constitution clearly states that natural and man-made disaster preparedness, rescue, relief and rehabilitation responsibility falls under the concurrent power/jurisdiction of federal and provincial government. While twenty-two tasks are assigned to local level, disaster management is one of them (Schedule 8). In the list of concurrent powers of federal, provincial and local level, DRM is put as one of the subjects (Schedule 9) – implying that DRM is a shared responsibility of every layer of governance system, but more so at downward level.

4.2 The new Disaster Risk Reduction and Management Act, 2017

On 24 September 2017, the legislative-parliament unanimously passed a new Disaster Risk Reduction and Management Act, 2017. The Act is considered far progressive than the hitherto existing Natural Calamity Relief Act, 1982 in many respects. First, its approach to disaster is much comprehensive and recognizes both risk reduction and management as integral part of the task. Second, instead of committee-based coordination mechanism, the Act has proposed a clear multi-tier institutional structure of disaster risk reduction and management (at the centre, the provinces, the districts and the local level). Third, there is also a clear provision of Disaster Management Fund at the federal, the provincial, the district and the local levels. Fourth, the law has given the security forces the responsibility of search and rescue under civilian command. Fifth, the Government of Nepal has the ultimate responsibility of declaring disaster emergency if circumstance emerges so.

The most important of all, in terms of institutional structure, there will be a new National Disaster Risk Reduction and Management Centre (NDRRM Centre) at the Ministry of Home Affairs as the implementing arm of the government. The NDRRM Centre will be headed by a Secretary as the Chief Executive. The NDRRM Centre will work under direct supervision of the Executive Committee headed by Minister for Home Affairs. The Executive Committee, in turn, will make sure that the decisions and policy directives of the National Disaster Risk Reduction Council (NDRRM Council), the apex body headed by the Prime Minister, are implemented.

4.3 Other DRM Regulatory Frameworks

The Natural Calamities (Relief) Act was enacted in 1982. Although by its name it emphasizes the post disaster related activities, however, emphasis was also given to pre-disaster related activities such as preparation and mitigation measures besides relief and rescue operations. After the declaration of the International Decade for Natural Disaster Reduction (1990-1999) by UN, both the government and non-government agencies started to emphasize activities in areas related to preparedness against and mitigation of disasters in Nepal. The Act (1982) also made provision of Natural Disaster Relief Committees at central, regional, district and local levels and also two sub committees at central level.

Several efforts such as the National Action Plan on Disaster Management in Nepal (1996) were made to address different challenges posed by disasters in Nepal. The National Planning Commission developed Tenth Five Year Plan (2002 - 2007), and the Interim Three Year Development Plans (2007-2010 and 2011-2013) are the other important policies towards disaster risk management. The Guidelines implemented for distribution of relief materials to disaster affected people is another policy measure in that direction. Sector level policies on agriculture, water resources, health, housing building, mines and geology, etc. have also been playing major roles in managing disaster risks in Nepal.

Existing legal framework comprises the following:

Natural Calamities (Relief) Act, 1982-Natural Calamities (Relief) Act, promulgated in 1982 with an aim of smooth implementation of relief and rescue initiatives under the leadership of MoHA, remained the blueprint for DRM in Nepal for about 35 years. The Act also made provisions of institutional coordination mechanisms required for DRM. Despite of two consecutive amendments in the Act, it still missed the provision of proactive risk reduction measures, such as mitigation, preparedness, and mainstreaming DRR in development process. The Natural Calamities (Relief) Act has now been replaced by a new Bill in 2017 (mentioned above).

Local Self Governance Act, 1999-The Local Self Governance Act, 1999 has promoted the concept of local-self governance within the decentralization framework for managing the environment-friendly development. The Act has given due emphasis to interrelationship between development process, environment, and disaster. The Act encourages local entities, i.e., District Development Committees (DDCs), Municipalities, and Village Development Committees (VDCs) for finding suitable solutions to local problems and challenges by themselves. In the absence of necessary rules, regulations, frameworks and predictable amount of budget, the Act was not effectively implemented by local bodies despite the responsibility given to them.

National Strategy on Disaster Risk Management (2009)- The National Strategy for Disaster Risk Management (NSDRM) (2009) was developed and enacted by government of Nepal in line with

the Hyogo Framework for Action (HFA) (2005-2015). NSDRM is the result of the necessity felt for a concrete, meaningful and integrated document based on (HFA) reflecting the global common concept, which the United Nations declared in 2005 in participation of 168 nations including Nepal. NSDRM is a national framework on disaster risk management with commitment of the government to protect its citizen, properties, physical and cultural assets. NSDRM was developed and endorsed by government almost after five years of the HFA.

NSDRM (2009) tried to translate all five priority areas of HFA (2005-2015) into action. Therefore, based on the situation (policy, institutional mechanism, national capacity and financial resources), it emphasized the importance of mainstreaming disaster risk reduction to development at all levels. The NSDRM (2009) was useful to continue the advocacy on importance of mainstreaming DRR into development, capacity building, bringing private sector in DRR and post disaster related activities, and to some extent urban disaster risk reduction initiative in Nepal. However, the activities initiated during HFA period not well documented neither detail evaluation of the completed activities except the regular country level HFA report (2005-2015) and 2013-2015. Unfortunately, there was not any detail assessment of HFA progress at macro-level in Nepal.

National Disaster Response Framework (2013)- The Government of Nepal endorsed the National Disaster Response Framework (NDRF) in 2013 with a view “to guide more effective and coordinated national response in case of a large scale disaster” and its scope was : a) limited to the response preparedness and emergency response at national, regional, district and local levels, and b) it consisted of actions taken immediately before, during and after the disaster directly to save lives and property, maintain law and order, take care of sick, injured and vulnerable people, and to provide essential services and to protect public property.

The NDRF (2013) clearly stated how the government should function after a major disaster strikes in the country, the coordination with international teams, donors, the cluster mechanism, special arrangement for national response, and the anticipated activities to be performed by organizations from zero hours of the incident till a month time. It has also clearly indicated the future course of action on emergency response preparedness in Nepal. The government is revising the NDRF (2013) to make it more practical based on 2015 earthquakes response in Nepal.

4.4 Existing Institutional Entities and Assignment of Tasks

There are a number of institutional entities that have role to play on matter of DRR in Nepal. Below we present a summary account of the major institutional entities.

Office of the Prime Minister and Council of Ministers- The Office of the Prime Minister and Council of Ministers has been performing the tasks of coordinating, directing, and facilitating the preparation of national policy and strategy to reduce disaster risk. Likewise, the office has been facilitating the resource mobilization and distribution of the fund for relief, reconstruction, and rehabilitation activities by government agencies.

National Planning Commission- National Planning Commission (NPC) plays lead role to formulate long-term, periodic, and annual development plans. The NPC has also been mobilizing resources from bilateral, multilateral and international agencies for development in general disaster recovery/ reconstruction in particular. Also NPC has been engaged in frameworks, guidelines, manuals etc. in different development process including mainstreaming DRR into development.

Water and Energy Commission (WECS)- Water and Energy Commission is engaged in conducting empirical studies on rivers and streams to develop water resources in the country through its proper utilization. In addition, the WECS has been making necessary recommendations for disaster risk reduction by identifying disaster prone rivers and streams. It has been playing important role in managing water induced disaster by bringing out a long-term water resource and management policy.

Ministry of Home Affairs- MoHA has been working as the lead ministry in the field of disaster management in Nepal. The MoHA has been carrying out the responsibility of effective rescue and relief measures through the arrangements of Disaster Relief Committees at central, regional, district and local levels. The Ministry has gained technical and managerial experience in preparedness, rescue and relief, and coordination related to effective disaster management. For the last several years, MoHA is trying its best to bring/ enact a new and comprehensive DRM Act.

Central Natural Disaster Relief Committee (CNDRC)- It comprises 27 members and is chaired by the Minister for Home Affairs to make effective and efficient relief arrangements and better coordination among both government and non-government agencies as stipulated in the Natural Calamities (Relief) Act, 1982. The Committee holds at least two meetings annually or as necessary to manage challenges posed by disaster at any time.

Ministry of Federal Affairs and Local Development- MoFALD has been playing a critical role to raise the technical and functional capacity of local authorities on disaster risk reduction, mainstreaming DRR into local development plan and fire control/ management. MoFALD also

develop framework, guidelines and manuals on local disaster management plan, mainstreaming DRR into local plan and planning process including awareness raising at all levels.

Ministry of Irrigation- Ministry of Irrigation has been formulating and implementing policy on water induced disasters management, flood management and river training. Likewise, the Ministry also works to minimize future disaster risk while designing and constructing new irrigation schemes and also while maintaining existing systems.

Ministry of Education (MoE)- Curricula development and update, raising technical capacity on DRR are the major activities of MoE in the field of disaster risk management in Nepal. In addition, MoE has also been constructing earthquake resistant school buildings, and raising awareness programs through teachers, students and school management committees.

Other ministries working in the field of DRM in Nepal are:

- Ministry of Forests and Soil Conservation (MoFSC)
- Ministry of Environment (MoEn)
- Ministry of Science and Technology and Environment (MoSTE)
- Ministry of Health and Population (MoHP)
- Ministry of Industries (Mol)
- Ministry of Agriculture Development (MoAD)
- Ministry of Water Resources (MoWRs)
- Ministry of Urban Development (MoUD).

4.5 DRM Priorities in the 14th Development Plan

DRM has been under priority of periodic development plans since the 10th Five Year Plan. The current 14th Plan (2072/73-2075/76) (NPC 2016) accords programmatic priority to water-induced disaster risk management under its sectoral development policies (pp. 84-87). It aims at mitigating potential loss of human lives and properties and physical infrastructures by effective river embankment programmes in order to control floods and landslides, and to mitigate their effects. It has also kept in priority in addressing the problem of flood and inundation. The Plan, under its cross-cutting development policies, accords priority to disaster management in combination with risk management related to environment and climate change (pp. 252-261).

Efforts to mainstream disaster risk management in sectoral development priorities, however, remained as missing opportunity.

4.6 Way Forward

In this chapter we mainly drew existing institutional and legal/policy framework with regard to DRM in Nepal, from the Constitution 2015 to the NDRF 2013, and from the NSDRM 2009 to the

current 14th Development Plan. In course of writing this report, the legislative-parliament endorsed the new Disaster Risk Reduction and Management Act, 2017, which has been reviewed here along with the existing Natural Calamity Relief Act, 1982. We have also noted that NSDRM 2009 is soon replaced with a new SFDRR-aligned National DRR Policy and Strategic Action Plan which is quite comprehensive.

Government of Nepal is good in developing policies, plans and frameworks. However, the successful implementation of such policies and plans are always a challenge due to many reasons including weak technical knowledge, regular transfer of government officials and frequent changes of government among others.

In the Nepal's development history, the 10th Five Year Development Plan (2002-2007) recognized the importance of disaster risk management in the country and had a chapter in it. Unfortunately, that stand alone chapter was not well integrated into entire development plan, budget allocation and monitoring mechanism. Therefore, the development activities were implemented leaving DRM concept behind. Therefore, despite having the recognition in the development plan, DRM related activities were not implemented in the reality and the country continues to face the losses of life and property due to different disasters.

The government of Nepal is recently developing a national policy and action plan aligned with SFDRR, one which will replace the NSDRM 2009, and a new DRM Bill has recently been endorsed by the legislative-parliament (on 24 September 2017). There is wider hope that these two important documents will serve as a turning point for Nepal to be a disaster resilient nation.

In this backdrop, two straightforward agendas ahead are (a) to roll out and localization of the new DRR Bill, the most important of which is to set up institutional structure ranging from National DRM Council, followed by Executive Committee, and then the National DRRM Centre. There should also be a tier of provincial, district and local level Disaster Management Committees. (b) The Government is also expected to effectively implement the DRR Policy and Strategic Action Plan 2017 once it is finalized and endorsed.

Chapter 5: From HFA to SFDRR: Carving the Road Ahead

5.1 Nepal's Response to Yokohama Strategy and Plan of Action

During the International Decade for Natural Disaster Reduction, 1990-2000, a World Conference on Natural Disaster Reduction was organized in Yokohama, Japan on 23-27 May 1994. The Conference adopted Yokohama Strategy and related Plan of Action for a Safer World for the rest of the Decade and beyond. The Yokohama Plan of Action promised to promote and strengthen international cooperation in activities to prevent, reduce and mitigate natural and other disasters with particular emphasis on (a) human and institutional capacity building and strengthening, (b) technology sharing, the collection, the dissemination and the utilization of information, and (c) mobilization of resources (UN Department of Humanitarian Affairs 1994).

In response to Yokohama Plan of Action on Natural Disaster Reduction, Nepal constituted IDNDR National Committee which prepared National Action Plan on Disaster Management in Nepal, adopted by Government in 1996 (MoHA 1996). Primarily in the form of matrix, this Plan of Action preparedness, response, reconstruction and rehabilitation, and mitigation with stipulated priority activities, time of completion and roles assigned to implementing agencies. The Action Plan also constituted an M&E committee in order to monitor the implementation, and identified materials and medicines required for emergency response, the implementation, however, remained weaker.

5.2 HFA (2005-2015) Achievements in Nepal

The World Conference on Disaster Reduction was held from 18 to 22 January 2005 in Kobe, Hyogo, Japan, and adopted the Hyogo Framework for Action, 2005-2015. The Conference provided an opportunity to promote a strategic and systematic approach to reducing vulnerabilities and risks to hazards. It underscored the need for building the resilience of nations and communities to disasters (UNISDR 2005).

The scope of Hyogo Framework for Action, according to UN Office for Disaster Risk Reduction, encompasses disasters caused by hazards of natural origin and related environmental and technological hazards and risks (UNISDR 2005). It thus reflects a holistic and multi-hazard approach to DRM and the relationship, between them which can have a significant impact on social, economic, cultural and environmental systems, as stressed in the Yokohama Strategy.

HFA Priorities for action were to (a) ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation, (b) identify, assess and monitor disaster risks and enhance early warning, (c) use knowledge, innovation and education to build a culture of safety and resilience, (d) reduce the underlying risk factors, and (e) strengthen disaster preparedness for effective response at all levels (UNISDR 2005).

Nepal's performance in translating HFA's commitments into reality achieved a mixed success (MoHA 2015, UNDP Nepal 2015). On top of that the progress and achievements also remained uneven – as evidenced in national progress reports submitted to UN on the implementation of the Hyogo Framework for Action (2009-2011, 2011-2013, 2013-2015).

The final report submitted to the UN, entitled “National Progress Report on the Implementation of the Hyogo Framework for Action” (MoHA 2015) and an independent assessment of DRM integration into development plans (UNDP Nepal 2015) show ample space for improvement despite a few achievements. The Government of Nepal has directed local authorities to allocate 5% of local budgets for DRR related activities. It was expected that a consolidated guideline and plan for mainstreaming DRR into development will be agreed in 2015, which is yet to be materialized. For CRM, Nepal utilized the National Adaptation Plan of Action (NAPA) and the Local Adaptation Plan of Action (LAPA) to ensure that CRM issues were incorporated into broader planning processes at the national, regional and local level.

Strengthening policy and institutional framework agenda remained largely unachieved. The draft Disaster Management Act was not endorsed during the review period, which now includes mechanisms at the federal, provincial and local level to ensure that risk reduction efforts are integrated within development processes. Currently, the MoHA prioritizes and integrates risk reduction, preparedness and policy issues including mainstreaming DRR. The NRRRC Flagship Programmes (now phased out) also contributed to ensure risk reduction efforts and are aligned with national strategy and mainstreamed into development.

The process of approval of the Early Warning Strategic Action Plan also remained pending, which was expected to be instrumental in developing the framework for installation, operation and maintenance of EWS for major

hazards throughout the country. As of 2015, basic Level EWS has been established in the seven major river basins, two GLOFs, and two for landslide among additional efforts in other areas (MoHA 2015). For additional policy response to HFA, see **Box 5.1**.

Box 5.1: Nepal's key policy response to HFA

- Adoption of the cluster approach (2008 onward)
- National Strategy for Disaster Risk Reduction (NSDRM), 2009
- District Disaster Preparedness Response Plan, 2011
- Local DRM Plan Guideline, 2012
- National Disaster Response Framework (NDRF), 2013
- Post-Disaster Recovery Framework (PDRF), 2016.

On the front of *strengthening institutions at national level* Nepal has been lagging behind. The much awaited new DRM Bill was not endorsed during this period. There is a high level Climate Change Council under the chairmanship of the Prime Minister but the DRM did not have any such institutional set up. Now that the DRM Bill has been endorsed, GoN will establish a dedicated institution at national level and a Disaster Management Committee at provincial and local levels for enhanced coordination and for sustained effort on DRM. The establishment and institutionalization of an authentic and open DRM System, GIS based DIMS will be initiated at the central level through SAHANA software (MoHA, 2015).

On issues of *strengthening capacity at community level*, as MoHA (2015) makes it clear, MoFALD and the NRRC developed minimum characteristics for community resilience and used it to support standardized approaches at building community capacity for DRR. Through this, over 635 VDCs and municipalities (a quarter of the population) were reached. At the municipal level, 58 municipalities have been equipped with fire brigade with the support of the MoFALD while a crops and livestock insurance system has been established by MoAD. National and district level land use mapping has been completed. Likewise, land use mapping of 254 VDCs has also been completed. Capacity at local level for multi-hazard risk assessment and implementation of risk reduction measures are not yet materialized.

In order to *enhance capacity to monitor and respond*, MoHA has established NEOC in Kathmandu and expansion of EOCs in all 5 regions, 42 districts and 5 EOCs in municipalities have been created. A resilient communication system has been placed through these EOCs. A tailor made Disaster Management Information System named SAHANA has already been developed, and it will be institutionalized both at centre and district levels. SOP for National and district EOCs have been finalized and simulation exercises have been conducted in 16 districts to test the SOP and coordination mechanisms. However, creating a network of warehouses for assuring food security could not be fully materialized during the review period. Nepal Red Cross Society has established 12 warehouses in strategic locations in Nepal with a capacity to support a maximum of 36,000 families. The Government of Nepal has identified and secured 83 safe open spaces for emergency response in Kathmandu Valley (MoHA 2015). These spaces will act as hubs for response efforts in a large scale emergency situation.

Toward *strengthening mechanisms for post-disaster recovery*, it is to be noted that the primary response mechanism for the Government has been a nationally coordinated cluster approach, with 11 established clusters. Through this approach, Government and humanitarian partners coordinate response efforts. A key component within each cluster is early recovery planning where post-disaster recovery issues are integrated into contingency planning.

National Reconstruction Authority (NRA) was established in 25 December 2015 (2072) for five years to lead and manage the reconstruction and recovery of the 2015 earthquake. The NRA's overall goal is to promptly complete the reconstruction damaged by the earthquake, to promote national Build Back Better interest. NRA has formulated a Post-Disaster Recovery Framework (PDRF) (2016-2020) on the basis of PDNA (NRA 2016). The government has sufficiently allocated the budget for reconstruction and recovery initiatives. Similarly, almost all of the affected families have received the first installment of the grant and recovery activities have been further expedited. The *National Disaster Response Framework* (NDRF) served as a key tool for coordination of 2015 earthquake response, facilitating decisions and instructions from the central to districts.

5.3 Sendai Framework for Disaster Risk Reduction (SFDRR)

The Sendai Framework aims at achieving “substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries” by 2030. This expected outcome will be monitored through indicators against seven targets. The seven targets aim to contribute to reducing (a) mortality, (b) number of affected people, (c) economic losses, and (d) damage to critical infrastructure; and in increasing (e) the number of national and local DRR strategies, (f) level of international cooperation, and (g) availability of and access to multi-hazard early warning systems and disaster risk information.

SFDRR has set out four Priorities for Action. They are as follows:

Understanding Disaster Risk- The priority focus of understanding disaster risk will be the national disaster risk assessment, consisted of, but not limited to, design, development, dissemination and application of results on routine manner and periodic disaster risk assessments. For this, maintaining national disaster loss database is a key challenge. At this priority area we need to make sure that, first, required knowledge, science and data are available to all, and second, ensuring that policies and practices for DRM are based on the clear understanding of vulnerability and exposure to hazards. The policy framework to put in place needs to be informed by nature, frequency and characteristics of hazards and consequent disasters.

Nepal's current status- The priority focus of understanding disaster risk will be the national disaster risk assessment, consisted of, but not limited to, design, development, dissemination and application of results on routine manner and periodic disaster risk assessments. Data on disaster loss and damage are collected, compiled and maintained by MoHA, and presented online in a portal called “Nepal DRR Portal.” MoHA is preparing to use Sahana as the DMIS but it is yet to be operational. However, disaster data are never analyzed and undertaking e risk

assessments (routine or periodic) is not a regular practice. Application of GIS and overlaying loss and damage data with geospatial datasets is also not the normal practice.

Hazard warning analysis and risk evaluation is hardly done based on scientific data analysis. Sharing and dissemination of knowledge and lessons learned is not yet a regular practice. There is not a dedicated disaster related training institute. Trainings are organized, but they are largely supply driven. Nepal's technical and scientific capacity at national and local levels on matter of DRM is very rudimentary. A pool of critical cadre, adequately equipped, technologically trained and capacitated, is yet to be developed.

Strengthening Disaster Risk Governance to Manage Disaster Risk- The system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy. Good governance needs to be transparent, inclusive, collective and efficient to reduce existing disaster risks and avoid creating new ones.

Nepal's current status- The system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy form part of strengthening disaster risk governance. Until recently there existed an apparatus of government coordination mechanism to respond to the events of disasters. This spanned from community to national level "disaster relief committees." They were, however, very much response-centric. SFDRR calls for a dedicated, powerful and resourceful National Disaster Management Authority that could better coordinate among relevant stakeholders. The recent enactment of a new DRM bill from the parliament has paved the way for the establishment of such a dedicated institution.

Nepal has made notable success in formulating laws, policy, regulations over recent years. The National Disaster Strategy on DRM (NSDRM), 2009 is one of the recent and comprehensive policy frameworks, which is being replaced by an even more updated National DRR Policy and Strategic Action Plan 2017. The National Disaster Response Framework (NDRF), formulated in 2013, reflects Government's shifting emphasis toward disaster preparedness.

In view of Nepal's transition to federal system new layers of governance units and mechanisms are being worked out. The existing framework of DRM will soon be irrelevant. This demands a new institutional landscape to be worked out and capacity for DRM in terms of technical, technological, financial and administrative enhanced at all the federal, provincial as well as local levels.

Investing in Disaster Risk Reduction for Resilience- Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to

enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation.

Nepal's current status: Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. They can be drivers of innovation, growth and job creation.

Mainstreaming of disaster risk assessments into land-use policy development and implementation is an area where Nepal has to work substantially. Although, NLUP encourages relocation of settlements from hazard-prone areas and envisions settlement development in safer locations, the NLUP is yet to be made risk-informed. The Building Act 1999 promotes safer building practice in Nepal. The adherence to the building code, however, remains weak.

Nepal's rich cultural and heritages, due to their improper repair and maintenance, are prone to damage even in the event of minor earthquakes. Nepal lost many of its historical heritages during 2015 Gorkha Earthquake. Livelihood loss is another area where disasters do impact severely and regularly. Investment on risk transfer, safety nets, poverty and food insecurity is another area where there is enough space for intervention for risk reduction and resilience building. Nepal's preparation in terms of protecting critical facilities and services remains poor. After the 2015 Gorkha Earthquake, schools remained closed for more than 35 days. Health posts and sub-health posts in disaster hit districts had almost collapsed structurally and functionally.

Disaster Preparedness for Effective Response and "Build Back Better"- Preparedness is the knowledge and capacities to effectively anticipate, respond to, and recover from, the impacts of hazard events or conditions. Preparedness action is carried out within the context of DRM and aims at building the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required.

Nepal's current status: Preparedness is the knowledge and capacities to effectively anticipate, respond to, and recover from, the impacts of hazard events or conditions. Preparedness action

is carried out within the context of DRM and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Nepal has made noticeable progress in developing regulatory frameworks for DRM. In addition to the recently introduced DRM Bill, a number of guidelines, procedures, action plans have already been put in place. Still, there is much space for improvement.

After the 2015 Gorkha Earthquake, National Reconstruction Act, and Reconstruction and Rehabilitation Policy, 2015 have been developed. In addition, a Post Disaster Recovery Framework (PDRF), 2016 has been formulated. In view of the new DRM Bill, new policy framework will have to be developed in near future.

On matter of capacity building and putting mechanism in place, evacuation and mock drills are organized in Nepal, but they are infrequent and *ad hoc*. Local authorities severely lack such capacities. Nepal's security force (including Nepal Army, Armed Police Force, and Nepal Police) do have trained human resources on SAR, but to a limited extent. Nepal has to develop a standby pool of dedicated Light SAR Teams and Medium SAR Teams, community-based first responders, and depute them in several strategic locations across the country. Equipments and infrastructure available for SAR training and operations are very limited.

Getting prepared for response in times of emergency, early warning and evacuation systems are crucial.. The Department of Hydrology and Meteorology (DHM) is mandated to monitor all hydrological and meteorological activities in Nepal, but its capacity of early warning and informing people in need of the information is questionable. The Nepal DRR portal also has not been linked to disseminate early warning. This is an area where Nepal has to improve substantially.

Finally, the Sendai Framework's primary focus on risk reduction and resilience is a common element highlighted in all the 2030 development agenda adopted by all member states of the United Nations, such as the Addis Ababa Action Agenda on Financing for Development, the Sustainable Development Goals, the Paris Agreement on Climate Change, the Agenda for Humanity and New Urban Agenda.

5.4 Other International Frameworks and Commitments

The Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR)-This first Asian Ministerial Conference for Disaster Risk Reduction (AMSDRR) after the advent of the Sendai Framework was hosted by the Government of India in November 2016. As a follow-up from the 6th Asian Ministerial Conference outcome (2014) and as a requirement of the Sendai Framework, the AMSDRR conference concluded with the adoption of the New Delhi Declaration; the Asia Regional Plan for Implementation of the Sendai Framework together with a ten Voluntary Commitment Action Statements.

AMCDRR provides, first, broad policy direction to guide the implementation of the Sendai Framework in the context of the 2030 sustainable development agendas in the region. Second, it also provides long term road map, spanning the 15-year horizon of the Sendai Framework outlining a chronological pathway for implementation of priorities to achieve seven global targets. Finally, the AMCDRR also provides two-year action plan with specific activities that are prioritized based on the long term road map and in line with the policy direction (for milestone activities by 2018 see Box 5.2).

The two-year action plan is in line with the policy direction and contributes to the achievement of the milestones in the long term road map. The action plan is derived from priorities shared by governments and stakeholders during the development of the Asia Regional Plan and in consultations through the ISDR Asia Partnership (IAP). The two-year action plan will be reviewed and updated in line with the biennial Asian Ministerial Conferences and through the IAP forum.

Box 5.2: Key milestones of the AMCDRR roadmap by 2018

1. Technical guidance by UNISDR to national indicators is finalized with a link to SDG targets and indicators.
2. 50 percent of countries have prepared a design to establish a national mechanism to collect, analyze and disseminate information on disaster losses and risk aiming to achieve appropriate level of disaggregation for gender, age and disability.
3. 40 percent of countries have revised/ developed their national strategies and/ or plans for disaster risk reduction in line with the Sendai target (e).
4. 50 percent of countries have reviewed their initial progress in implementation of the Sendai Framework through the Sendai Monitor.
5. 40 percent of countries have established multi-sectoral and multi-stakeholder national and local platforms to foster the dialogue and cooperation between governments, science and technology community and other stakeholders for risk-sensitive development and innovative risk management.
6. 10 percent of countries have developed regulatory or policy frameworks to reinforce risk considerations and risk reduction measures into development initiatives, particularly in the infrastructure sector. (Source: AMCDRR. 2016. p. 6)

The Paris Agreement_ The 1992 Parties to the UN Framework Convention on Climate Change (UNFCCC) adopted on 12 December 2015, the Paris Agreement, and a new legally-binding

framework for an internationally coordinated effort to tackle climate change (Climate Focus, 2015). The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise for this century below 2 degrees Celsius and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. To reach these goals, appropriate financial flows, a new technology framework, and an enhanced capacity building framework will be put in place. This will support

Box 5.3: The pre-2020 action of the Paris Agreement

The decision calls for enhanced action prior to 2020. This can be summarized in the following categories:

Mitigation: Parties are urged to ratify and implement the second commitment period to the Kyoto Protocol up to 2020, to make and implement a mitigation pledge, and improve ensuring and reporting processes. Parties resolve to strengthen the existing technical examination process on mitigation, which means increased cooperation with non-country stakeholders, increased consultations and dissemination of results.

Adaptation: Parties have decided to launch a technical examination on adaptation, which will function in a similar manner to the technical examination on mitigation, focusing on lesson sharing and identifying opportunities for implementation and cooperative action.

Finance: The COP decision 'strongly urges' developed countries to scale up their levels of financial support with a concrete plan to reach the USD 100 billion target by 2020. The Decision singles out adaptation finance as an area which needs a significant increase of finance from current levels. (Source: Climate Focus 2015)

action by developing countries and the most vulnerable countries, in line with their own national objectives (see Box 5.3).

The Paris Agreement defines a universal, legal framework to "strengthen the global response to the threat of climate change" (Art. 2). It establishes the obligation of all Parties to contribute to climate change mitigation and adaptation. It requires that all countries develop plans delineating ways to contribute to climate change mitigation, and will commit their "nationally determined contributions" (NDCs). The Paris Agreement is unique compared with any other international agreements in the sense that it puts emphasis on processes rather than on defined mitigation goals. For example, unlike the Kyoto Protocol, the Paris Agreement does not formulate country specific emissions targets. Instead, it depends on voluntary mitigation contributions and a series of processes that seek to ensure progress in meeting the initial and progressively more ambitious mitigation contributions.

The Paris Agreement establishes the main framework for cooperative action on climate change beyond 2020. The decision accompanying the Paris Agreement has a number of complementary functions: (a) it provides a framework under which the Paris Agreement is

adopted; (b) it contains guidance on pre-2020 climate action; (c) it regulates action that needs to be taken before the Paris Agreement enters into force; and (d) it contains detail guidance on how to develop and formulate NDCs.

In brief, the Paris Agreement creates a global goal on adaptation that had been absent from previous UNFCCC agreements, aiming to enhance “adaptive capacity, strengthening resilience and reducing vulnerability to climate change” (Art. 7.1). The Agreement determines that countries should put more emphasis on adaptation planning, and based on this planning Parties should strengthen their cooperation, including through the transfer of funds. The adequacy of action and support will be reviewed as part of the global stocktaking.

Nepal has ratified the Paris Agreement on climate change on 4 October 2016. The Paris Agreement was approved unanimously by a House session in the Legislature-Parliament. Nepal places climate change adaptation at the centre of its development plans and policies. It aims to strengthen implementation of Environment-Friendly Local Governance (EFLG) Framework in Village Development Committees and municipalities to complement climate change adaptation, promote renewable energy technologies, and water conservation and greenery development.

In 2015, Nepal launched a process to formulate and implement National Adaptation Plan (NAP) to address medium and long-term adaptation needs and reduce climate vulnerabilities. This will also promote integration of climate change adaptation into sectoral policies, strategies, plans and programmes. In February 2016, Nepal also communicated to the UNFCCC Secretariat its first INDCs.

The Sustainable Development Goals- The 17 Sustainable Development Goals (SDGs) adopted by world leaders in September 2015 at the UN Global Summit officially came into force on 1 January 2016. Over the next fifteen years countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change (UN Sustainable Development Homepage, UN, 2017). The SDGs build on the success and challenges of the Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty (NPC, 2017a). The SDGs are not legally binding. Governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals. Six of the 17 Goals are directly related to disaster, climate change risk and resilience (see Table 5.1). A reflection paper prepared by the UN Office for Disaster Risk Reduction identifies 25 SDG targets related to DRR (captured in 10 of the 17 SDGs), firmly establishing the role of DRR as a core development priority of the SDGs (see UNISDR, 2015).

Table 5.1: Disaster risk, climate change risk and resilience issues embraced by SDGs

Goals	Targets
Goal 1. End poverty in all its forms everywhere	By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-

	related extreme events and other shocks and disasters (1.5)
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality (2.4)
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all (9.1)
	Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States (9.a)
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums (11.1)
	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries (11.3)
	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations (11.5)
	By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for DRR 2015-2030, holistic DRM at all levels (11.b)
	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials (11.c)
Goal 12. Ensure sustainable consumption and production patterns	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature (12.8)
Goal 13. Take urgent action to combat climate change and its impacts	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries (13.1)

Source: UNSD (2017)

In Nepal, the Government has prepared its national report on SDGs 2016-2030.¹¹The aim of this report is to analyze the proposed SDGs from Nepal's perspective and set the stage for embarking on the implementation of the sustainable development agenda for the next 15 years (NPC 2015). Nepal has also carried out national review of SDGs. This review (NPC, 2017a) gives the preliminary findings of a review of the enabling environment, institutional mechanisms, systems to generate evidences of its periodic achievements, challenges ahead, progress and preparation for effectively implementing SDGs friendly intervention in the country.

Finally, Nepal has laid foundation for effective implementation of SDGs commitments by accomplishing Baseline Report on SDGs (NPC, 2017b). This report is an update of the National SDGs Report prepared by NPC in 2015 (see NPC, 2015). It revises SDGs indicators to make them consistent with global ones, updates their baseline status, and revises the targets set for 2030. The report also assesses the national situation by each SDG from national perspectives, examines their relevance in the national context and provides inputs for national planning, dialogue, and shows a pathway for implementation.

The Baseline Report on SDGs is also expected to guide the work plan and implementation of the SDGs in the coming years as Nepal aligns its 14th periodic plan along with the 17 Goals and their targets. However, Nepal is yet to integrate and harmonize among different international commitments, including, but not limited to, DRM priorities together with climate change risk reduction strategies.

The Addis Ababa Action Agenda- The Addis Ababa Action Agenda (AAAA) (UNDESA, 2015a), adopted at the Third International Conference on Financing for Development (Addis Ababa, Ethiopia, July 2015) and endorsed by the General Assembly in its resolution 69/313 of 27 July 2015, is all about financing sustainable development and developing sustainable finance. It seeks to look into a new financing framework to ensure a complete realization of new global development agendas including SDGs. The Action Agenda (AAAA), according to Department of Economic and Social Affairs briefing notes (UNDESA, 2015b), provides a comprehensive set of policy actions by Member States, with a package of over 100 concrete measures to finance sustainable development, transform the global economy and achieve the Sustainable Development Goals.

A new global framework for financing sustainable development that aligns all financing flows and policies with economic, social and environmental priorities and ensures that financing is stable and sustainable. The Action Agenda draws upon all sources of finance, technology and innovation, promotes trade and debt sustainability, harnesses data and addresses systemic

¹¹This made Nepal the first country in the world (UN, 2017) to publish its SDG country report and symbolizes Nepal's commitment and readiness to execute the SDGs.

issues. The Action Agenda, it is noted, also establishes a strong foundation to support implementation of the 2030 Agenda for Sustainable Development. The Action Agenda also serves as a guide for actions by governments, international organizations, the business sector, civil society, and philanthropists.

Global Platform for Disaster Risk Reduction, Cancun, Mexico- The Global Platform for Disaster Risk Reduction (Global Platform), as recognized by the UN General Assembly, is the main forum at the global level for strategic advice, coordination, partnership development and the review of progress in the implementation of international instruments on disaster risk reduction. The 2017 Global Platform for Disaster Risk Reduction was held in Cancun, Mexico on 22-26 May, 2017. Nepali delegation was led by H.E. Arjun K. Karki, Ambassador of Nepal to the United States, who also gave an official statement of delegation of the Government of Nepal.

Nepali delegation also presented a National Position Paper on behalf of the Government of Nepal that contains Nepal's disaster profile, experiences and lessons learned from 2015 Earthquake and the recovery initiatives. The paper highlights, among other issues, institutionalization of a robust Disaster Management Information System (DMIS) initiated with the establishment of DRR portal as one point shop to facilitate collection, analysis and dissemination of disaster related information (Government of Nepal, 2017). Likewise, it highlights cluster approach that has been institutionalized for effective implementation and better coordination in disaster management. The fact that 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 got priority in the position paper. Finally, the position paper also outlines a number of challenges for a smooth implementation of SFDRR in Nepal.

Gender Responsive Disaster Management- Gender in disaster is one of the neglected fields in Nepal. Although, NSDRM, 2009 has clearly mentioned gender sensitivity and social inclusion in its directive principle stating that mainstreaming of gender sensitivity and social inclusion is necessary in disaster risk management, there is corresponding lack of gender and social inclusion mainstreaming in DRR in Nepal. The upcoming National DRR Policy and Strategic Action Plan, 2017-2030, is also believed to be incorporating GESI concerns in the national DRR action plan which is to replace the NSDRM 2009. Still, GESI concerns are not given adequate considerations on the ground.

The National Women's Conference on Gender Responsive Disaster Management held in Kathmandu, March 1-2, 2016 calls for the Government of Nepal, in accordance with the "Sendai Framework," to adopt gender, age, disability and culture in all policies and practices and promote women and youth leadership, necessary provisions be made to strengthen the role of

women and girls for community's disaster resilience, gender equality and women's empowerment (National Women's Conference on Gender Responsive Disaster Management 2016). It calls for NRA to draft and implement necessary policy and plans to ensure gender proportional and inclusive participation (50:50) for gender responsive disaster management in the context of post-earthquake reconstruction. To the Government of Nepal, it calls for developing "humanitarian assistance national standard" to implement disaster response programme by fully guaranteeing people of all age, gender, class, ethnicity, indigenous nationalities, religion and the basic and special rights of women of all kinds of physical, mental and marital status, and in a way to address the existing gender inequality in a gender responsive way.

5.5 Mainstreaming DRM and CCA into Development

Successful risk reduction must be initiated well before a disaster strikes. It is important not to merely focus on responding to disasters, but also on disaster prevention, mitigation and preparedness. Hence, DRR and CCA need to be integrated into long-term development planning to reduce underlying socio-economic vulnerabilities, protect interventions against hazards, and ensure that development policies and programmes do not increase or create further risks (Swiss NGO DRR Platform, 2016).

DRR and CCA can save lives and livelihoods, and aim at strengthening the resilience of communities enabling them to anticipate, absorb, and bounce back from shocks, stresses and hazardous events. United Nations Framework for Convention on Climate Change (UNFCCC) defines CCA as "adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects that moderate harm and exploit beneficial opportunities" (UNISDR, 2010). Climate change leads to gradual changes in variables such as average temperature, sea level, and the timing and amount of precipitation. Climate change also contributes to more frequent, severe and unpredictable hazards such as cyclones, floods and heat waves—"extreme weather events." This can include:

- a) Adapting development to gradual changes in average temperature, sea level and precipitation; and
- b) Reducing and managing the risks associated with more frequent, severe and unpredictable extreme weather events.

An effective reduction of losses and risks from natural hazards and climate extremes requires integrated actions at different levels of governance. One of the greatest challenges faced today is in creating institutional convergence that integrates global goals emanating from the SDGs, the SFDRR, and the Paris Agreement on Climate Change. It is important to note here that DRR

and CCA are part of key agendas being considered in all these recent global agreements (Lassa, Jonatan A. and Margareth Sembiring, 2017).

Nepal being one of the most vulnerable countries to climate change is variably exposed to water-induced disasters and hydro-meteorological extreme events such as droughts, storms, floods, inundation, landslides, debris flow, soil erosion and avalanches. One of a recent assessments carried out by MoSTE identifies that current climate variability and extreme events have led to major impacts and economic costs in Nepal, emanating from not only by floods and landslides but also by rainfall variability on agriculture (rain-fed agriculture, soil erosion, droughts) and Glacial Lake Outburst Floods (GLOFs) (MoSTE, 2014). A number of additional potential effects from climate change are recognized, including higher flood risks, enhanced soil erosion and changes in the range/prevalence of pests and diseases.

As a Least Developed Country (LDC) adhering to UNFCCC commitments, Nepal has already initiated national level policy and institutional responses to mainstream climate change into the development process. Nepal had put in place National Adaptation Programme of Action (NAPA) in 2010. In 2011, Nepal also prepared National Framework on Local Adaptation Plans for Action (LAPA) to implement adaptation actions at the local level and ensure integration of climate change adaptation into local to national planning process. Furthermore, Nepal's Climate Change Policy (2011) ensures allocation of at least 80 percent of the total budget from climate change fund to programme implementation at the community level. The climate change budget code, introduced in 2013, opens avenues to channel climate finance to the field level activities.

As Conference of the Parties to the UNFCCC at its sixteenth session (COP,2016) had decided to formulate and implement National Adaptation Plan (NAP), Nepal in 2016 has already started a process to formulate and implement NAP. The overall goal of the process is to formulate Nepal NAP and improve the institutional capacity of government to implement climate resilient development plan in Nepal. This is an opportune time, we note, to integrate local level DRR and CCA frameworks in order to avoid duplication of work and mainstream a DRM and CRM in a comprehensive manner.

5.6 Way Forward

This chapter outlines Nepal's transition of DRM policy and programmes from HFA priorities to SFDRR priorities. It briefly sketches out Nepal's achievement of HFA action agenda, which we found to be mixed (rated 2.8 out of 5.0 maximum). Then we set out SFDRR's four priority of action and assess where Nepal currently stands in each of them. Then we flag our observation that DRM and CCA need to be integrated in Nepal, particularly so at local level implementation, as on both streams basic tasks and issues are almost the same, and that CCA triggers hazards and disaster risks.

The new constitution of Nepal (2015) provides clear role and responsibilities to the local government related to DRM. Hence, DRM activities are one of the priority activities to be implemented at the local level. Therefore, hopefully in the days/years to come DRM activities are well mainstreamed in the local level (7-points) planning, budgeting and monitoring and evaluation process. However, to successfully accomplish this task, the local government needs more trained human resources, adequate financial support and technical inputs in a more regular manner.

Moreover, the country is committed to successfully achieve SFDRR goals, SDGs, Paris agreement and several other regional and global commitments. In this context, the mainstreaming of such goals and targets into the national and local development plans are most important. Without proper mainstreaming, allocating resources and supporting local authorities achieving such targets will remain a challenge for Nepal.

Chapter 6:

Envisioning the 'Road to Sendai' for Nepal

6.1 Priority Action Areas and Achievements for the Upcoming Years (2015 - 2017)

Government of Nepal in close partnership with UN agencies and other development partners is developing "National DRR Policy & Strategic Action Plan for Nepal (2017-2030)" which will be finalized within 2017. This DRR policy and strategic action plan responds to SFDRR priority areas and aims to make Nepal a safer and resilient nation by 2030. The Action Plan in the making aligns Nepal's DRM priorities with SFDRR priority action areas, such as:

- Understanding disaster risk;
- Strengthening disaster risk governance to manage disaster risk;
- Investing in disaster risk reduction for resilience; and
- Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

In addition to SFDRR-aligned strategic priorities and action agendas on disaster preparedness, response, and recovery, the action plan also contains thematic policy and action plan on five key development sectors, viz., productive sector, social sector, infrastructure, environment and natural resources, and gender and social inclusion.

Restructuring DRM in Nepal in line with federal structure (inclusive DRR perspectives): The new constitution of Nepal (2015) provides strong leadership and decision making authorities to the local body/government, especially municipality and rural municipalities. These two local bodies are independent local government that can design its own development plan, its implementation and monitoring. With these fundamental changes compared to previous authorities, the local government must implement activities in 23 major areas including disaster risk management. In major disaster prone municipalities and rural municipality, it is anticipated about 7 to 10 per cent of the total annual budget will be spent in disaster risk reduction and response. Earlier, the government allocated 5 per cent of its total budget to disaster risk management activities. Therefore, the new DRM/R Act which is yet to come must have paradigm shift from response/relief centric to risk reduction.

One of the major challenges for government is to capitalize the momentum of fresh elected representatives to inject the importance of disaster risk management in regular planning in their mind set both at municipalities and rural municipalities as these elected representatives are fresh, ready to invest in any good development planning and major development plan will be developed soon.

The new DMM Act which has just been enacted must be effectively implemented in the spirit of the new constitution making local government accountable to local challenges and opportunities including DRM and strongly linking DRM with CCA, poverty reduction and mainstreaming in sectoral development.

6.2 Anticipated Challenges

Among others the following issues could be major challenges for Nepal to achieve SFDRR within the stipulated time:

Effective Implementation of the Newly Endorsed DRM Act- The legislative-parliament on 24 September 2017 unanimously endorsed the Disaster Risk Reduction and Management Act, 2017, which replaces the existing Natural Calamity (Relief) Act, 1982. While the Bill is far progressive compared to 1982 Act, its effective implementation is a great challenge.

Understanding the Risk from a Broader Development Perspective- Effective and sustainable DRM/R related activities cannot be achieved and sustained in an *ad hoc* type of investment. Therefore, the development practitioners need how much financial resources that the sector is getting for the next and a few more years to come. Such a continuation of assured financial resources for at least five years will enable the development professionals to design and implement effective and appropriate DRM/R related activities.

Further, it is widely realized that in the absence of a separate budget code for DRM/R related activities, it has been extremely difficult to know how much fund the government is providing to sectoral ministries/departments, how much of it must be spent and what is the impact of it. Therefore, to measure the investment, impacts/ results in the field of DRM/R, a separate budget code is required.

Changing Mindset of Disaster Relief/ Response Centric Approach to One Which Takes Disaster As an Integral Part of Larger Development Context and Build Back Better- Even after facing a situation in which 500 people died, 100,000 people were affected and 30 million USD worth of property was lost due to various disasters annually, neither political leaders nor bureaucrats understand that disaster risk reduction is important in Nepal to sustain hard earned development initiatives and to reduce poverty. Likewise, the mindset of many people in Nepal is that “disaster risk reduction is not possible and, hence, only available option is post disaster related activities.” The DRM related activities, our own experiences, the experiences from neighboring countries and research carried out so far clearly reveal that disaster can't be stopped but its risk can be reduced. Moreover, the investment in DRR related activities are much cost effective than any post disaster related relief and response. Such existing mind set is also one of the several hindrances in the field of effective mainstreaming DRM/R into regular development initiatives.

6.3 Key Priority Issues for the Next Two Years

Creating an Effective Institutional Set Up- So far, Nepal lacked a dedicated institutional set up for an effective implementation of DRR policy in the country. While MoHA has been considered as the nodal body for DRM, the MoHA is by its nature response-centric. In the absence of a dedicated nodal body in the country that could approach DRM in a comprehensive manner Nepal lost many opportunities in the past. The major challenge among others in the field of DRM is the weak monitoring of on-going initiatives, scattered and scanty initiatives, poor coordination, weak sharing and learning opportunities, weak capacity development initiatives at all levels, less participation of the intended beneficiaries, etc. It is in this context that, as per the provision of the new DRR/M Act, Government needs to immediately start creating a new institutional set up, comprising NDRM Centre, NDRRM Council, Executive Committee and Provincial/District and Local Disaster Management Committees.

Training and Capacity Building As a Regular Exercise- The disaster related information shows that the number of natural disaster occurrences in the recent past is increasing. This trend may continue in next several years due to factors like climate change, faulty development practices, and many others. To cope with the challenges posed by the increasing trend of disaster occurrences every year, Nepal has to substantially raise its technical and functional capacity in

the broader aspect of DRM, especially that of women. The number of women casualties and injuries are higher than that of men. Therefore, it is not only training on different aspects of DRM that is required but also equipment, especially basic life saving equipment, office and operational support, basic information management, analysis and dissemination, etc. are required. It is imperative, therefore, that a resourceful National DRM Training Institute and Resource Centre be established to systematically and sustainably build and develop DRM capacity at all levels.

Instituting a Practice of Risk-Informed Development- For a disaster prone country like Nepal, mainstreaming DRR/M into development is the only way to sustain development gains, achieve SDGs and poverty alleviation. For the last several years, especially after 2002 (10th Five Year Development Plan), the Government of Nepal, with the technical support of its development partners, has initiated several efforts to mainstream DRR into development planning at all levels. The process is going on and recently National Planning Commission developed a comprehensive DRR and CCA mainstreaming guidelines to be incorporated into the national level development plan. This process of mainstreaming DRR and CCA into development is not a one-time business rather a continued and long term process. This has to go on. However, the missing element in this particular context is the regular monitoring and evaluation of the process, impact/ result and its improvement.

Allocation of Adequate Budget-The other important aspects are provision of regular budget for DRR/M related activities to government and non-governmental organizations. Many organizations both government and non-government do not have any clue about how much fund they will receive for DRM activities for next few years. Such a hazy circumstance on the availability of fund to continue the on-going initiatives and to commence new initiatives will ultimately jeopardize the sustainability and scaling up of on-going activities.

Giving the Local Levels the Leadership Stake for DRM- After federalizing the country and making local levels responsible for local development affairs including DRM, and the new DRR/M Act 2017 putting in place a multi-tier institutional set up for DRM as per the spirit of the Constitution of Nepal 2015, Nepal's conventional and centralized DRM practices shall be turned upside down by bringing local levels to the fore in matters of DRM. The challenge is that the newly instituted local levels themselves are weak in capacity and technical know-how. It is the task and responsibility of all stakeholders – for the next few years – to dedicate their attention, resource and engagement in coaching, mentoring and supporting local level governance units (particularly municipalities and rural municipalities) so that it enhances their capacity on DRM.

Consolidating DIMS and Linking it with Early Warning- A functional, one-stop, and accessible DIMS is one of the pre-requisites of effective DRM. MoHA maintained Nepal DRR Portal and

Sahana software based database are not up to the level yet. First, the level of disagreeability of this dataset is very low. Second, the database is not updated quickly. Third, the database is not linked to early warning, forecasting and knowledge dissemination. Finally, it is poorly linked to similar other systems, such as the one maintained by DHM, National Seismological Centre, etc. Hence, it is imperative that Government of Nepal should accord priority for a few more years in integrating, technological backstopping and maintaining a robust DIMS in Nepal, one that is linked to real-time risk analysis, early warning and dissemination.

Strengthening National Capacity of SAR- One issue that demands reiteration and a final emphasis is that Nepal should invest heavily on strengthening its SAR capacity up to the standard of INSARAG. The 2015 Earthquake made it amply clear how important it was to have the adequate capacity (skills, technologies, institutional set up, and resources) of national security forces to protect the lives of people who are trapped inside built infrastructures, and how important it was to build public awareness about safe behavior in times of emergency.

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Annex 1: Multi-hazard scenario of Nepal by its socio-economic loss, 1971-2016

Type of disaster	Number of incidents	Human loss				Houses damaged or destroyed*
		Death	Missing	Injured	No. of family affected	
Fire	8,721	1,605	-	1,619	259,935	86,261
Thunderbolt	1,711	1,620	129	2,684	7,140	963
Landslide	3,246	4,980	174	1,871	558,264	33,617
Wind storm	44	2	-	11	191	215
Flood	3,950	4,445	42	554	3,710,065	216,190
Epidemic	3,452	16,583	-	43,111	512,989	-
Avalanche	2	16	3	7	-	-
Snow storm	5	87	7	-	-	-
Hailstones	131	9	-	24	3,280	155
Earthquake	175	9,771	-	29,142	890,995	982,855
Cold wave	390	515	-	83	2,393	-
Structural collapse	389	404	-	596	2,016	1,793
Total	22,216	40,037	355	79,702	5,947,268	1,322,049
Average	494	890	8	1,771	132,162	29,379

Source: MoHA, 2017

* This includes animal sheds also.

Abbreviations and Acronyms

AAAA	The Addis Ababa Action Agenda
AIN	Association of International Non Governmental Organization
AMSDRR	Asian Ministerial Conference for Disaster Risk Reduction
APF	Armed Police Force
CBS	Central Bureau of Statistics
CCA	Climate Change Adaptation
CEO	Chief Executive Officer
CNDRC	Central Natural Disaster Relief Committee
CNDRC	Central Natural Disaster Relief Committee
CRM	Climate risk management
CSCDM	Citizen Support Committee for Disaster Management
DDC	District Development Committee
DDRC	District Disaster Relief Committee
DEOC	District Emergency Operation Centre
DHM	Department of Hydrology and Meteorology
DHS	Department of Health Services
DIMS	Disaster Information Management System
DLSA	district lead support agency
DMG	Department of Mines and Geology
DoS	Department of Survey
DP-Net	Disaster Preparedness Network Nepal
DRM	Disaster risk management
DRR	Disaster risk reduction
DRR Portal	Nepal Disaster Risk Reduction Portal
DSCWM	Department of Soil Conservation and Watershed Management
DWIDM	Department of Water Induced Disaster Management
EDCD	Epidemiology and Disease Control Division
EFLG	Environment-Friendly Local Governance
FEAT	Field Environment Assessment Tool
GDP	Gross domestic product
GLOF	Glacial Lake Outburst Floods
GoN	Government of Nepal
HEOC	Health Emergency Operation Centre
HFA	Hyogo Framework for Action
ICIMOD	International Centre for Integrated Mountain Development
INSARAG	International Search and Rescue Advisory Group
LAPA	Local Adaptation Plan of Action
LDC	Least Developed Country
MoAD	Ministry of Agriculture Development
MoE	Ministry of Education
MoFALD	Ministry of Federal Affairs and Local Development
MoHA	Ministry of Home Affairs
MoTSE	Ministry of Technology, Science and Environment

MOUD	Ministry of Urban Development
NA	Nepal Army
NAP	National Adaptation Plan
NAPA	National Adaptation Plan of Action
NASA	National Aeronautics and Space Administration
NDCs	Nationally Determined Contributions
NDR	Nepal Disaster Report
NDRRM Centre	National Disaster Risk Reduction and Management Centre
NDRRM Council	National Disaster Risk Reduction Council
NEOC	National Emergency Operation Centre
NGO	Non-governmental organization
NP	Nepal Police
NPC	National Planning Commission
NRA	National Reconstruction Authority
NRRC	National Risk Reduction Consortium
NSDRM	National Strategy on Disaster Risk Management, 2009
PDNA	Post Disaster Needs Assessment
PDRF	Post Disaster Response Framework
SFDRR	Sendai Framework for Disaster Risk Reduction
SOP	Standard operation procedure
UNDP	United Nations Development Programme
UNFCCC	UN Framework Convention on Climate Change
VDC	Village Development Committee
WECS	Water and Energy Commission
YVCsc	Youth Volunteers Coordination Sub-Committee