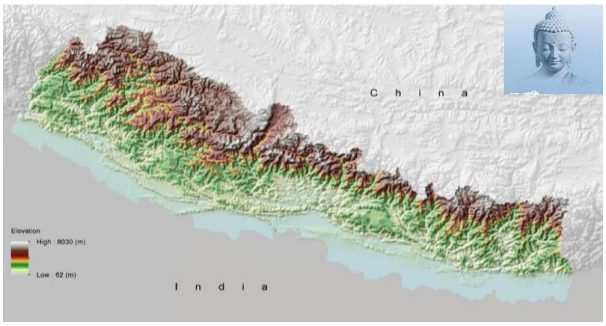
Nepal: A brief country profile on Disaster Risk Reduction and Management



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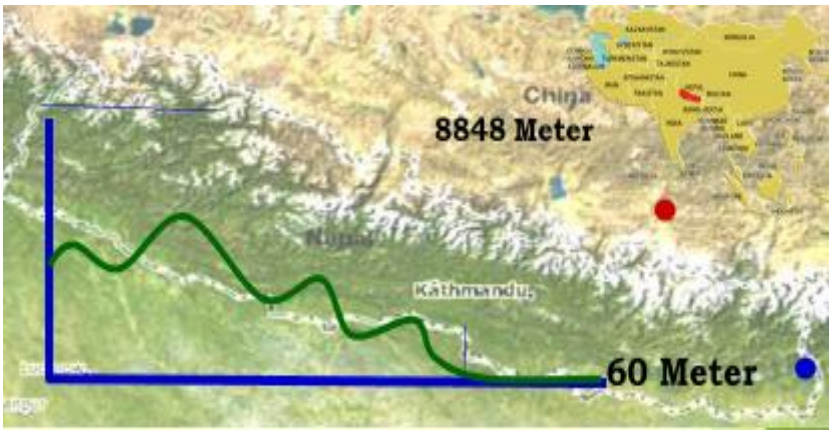
A brief Country Profile on Disaster Risk Reduction of Nepal

1. Background, in the light of Disaster

Nepal occupies an area of 147,181 square kilometers including both the high Himalayas to the north and plain lands to the south. Within this geography, Nepal is highly prone to multiple hazards, which exist primarily because of its diverse topography and climatic conditions, geological position, rugged mountains and steep landscape. Nepal, not only has relatively young mountains and geology, but also encompasses around one third of the world's total 2,400 kilometers of the Himalayas. The variation of altitude from 60 meters to 8,848 meters within less than 200 kilometers distance has led to the prevalence of natural disaster.

Nepal's steep slopes and the still growing Himalayan range coupled with heavy monsoon rainfall patterns lead to a wide range of geological and hydro-meteorological hazards across the country including landslides, debris flows, floods and glacial lake outburst floods (GLOFs), epidemics, droughts etc. Environmental degradation and climate change both interact with and exacerbate the occurrence and impact of natural hazard events. The frequent disasters caused by these hazards have shown an uprising trend.



Nepal is equally at risk due to its seismic activity. The subduction of the Indian tectonic plate into the Eurasian (Tibetan) plate has been continually thrusting the Himalayas upwards since its formation millions of years ago, making it geographically unstable. On top of geophysical and hydro meteorological conditions, socio-economic conditions of the people, frail human development index, scattered settlements in the rural vicinity, unplanned rapid settlements in the urban cities, environmental pollution, inadequate coping abilities of communities and challenges to mainstream DRR in development and its localization are some of the pertinent issues which further elevate the risk of disaster.

With the enforcement of the Natural Calamity Relief Act in 1982, Nepal was the first country – a pioneer country – with a disaster specific act in the South Asia region. In 1996, the Government of Nepal (GoN) produced the National Action Plan for Disaster Management followed by an Act as per Nepal's commitment to the International Decade of Natural Disaster Reduction. The Action Plan remained the foundational basis for the inclusion of the disaster management component in the Local Self Governance Act, that was developed in 1999. Disaster risk reduction began to receive more attention since the 10th Five-Year Development Plan (2002-2007) and the subsequent periodic plans. The institutional framework for disaster risk management was strengthened considerably since 2009 with the adoption of the National Strategy for Disaster Risk Management (NSDRM) in alignment with Nepal's commitment to the Hyogo Framework for Action (HFA).

In 2015, the Constitution of Nepal officially institutionalized Nepal as a Federal Democratic Republic with three tiers of governments based on the principles of coexistence, collaboration and coordination. In addition to the Federal Government, 7 provincial and 753 local level governments were formed with several exclusive and concurrent powers and duties of governments (including mandates for disaster risk management). Nepal's new federal structure and system of governance has provided opportunities to institutionalize a much more decentralized system of disaster risk management in Nepal. The Nepal Government (Work Division) Regulation, 2017 has identified the roles and jurisdiction of all federal ministries, where MoHA has been identified as the 'nodal ministry' for the coordination of disaster risk management activities throughout the country. The transition to federalism has provided a unique opportunity for the governments and stakeholders to build on past progress and limit the current and future threats by prioritizing stronger disaster risk management by all sectors at all levels. Administrative and governance system may play a significant role in enhancing resilience against disaster risk in Nepal. It vows to ensure the decentralized planning with the participation of local people in the local/community level process that is informed by and instrumental to achieve effective disaster risk reduction, but it needs to be carefully planned, implemented and followed up on. With a strong civil society, a significant proportion of youth among the country's population and strong partnerships with development partners all backed up by a new legal framework that will greatly reinforce existing institutional arrangements.

Principally guided by the Constitution, the Government has been prioritizing the development of more dynamic and modern policies, legal provisions and supporting guidance for effective and efficient disaster risk management. There has been much appreciated support from all stakeholders ranging from non-government, private sector and humanitarian actors working in the arena of disaster risk management. Some of the key legal instruments and policies on DRR recently endorsed are:

1.Disaster Risk Reduction and Management Act, 2017
2. Local Government Operational Act, 2017
3. Nepal Government (Work Division) Regulations, 2017
4. National Policy on Disaster Risk Reduction, 2018
5. Public Health Act, 2018
6. Disaster Risk Reduction National Strategic Plan of Action (2018-2030)
7. Private Housing Rebuilding Grant for the Flood and Landslide Victims 2017
8. Public Housing Program Implementation Sample Guidelines, 2018
9. Guidelines for the Relocation and Rehabilitation of High Risked Settlements, 2018

The Disaster Risk Reduction and Management (DRRM) Act was enacted in 2017 replaces the 1982 Natural Calamity (Relief) Act. Under this law, disaster management committees will be formed at the Provincial, District and Municipal levels. The act reinforces the government's efforts to bring disaster risk management initiatives to a new height. It puts emphasis on risk reduction over response; the legislation creates the DRRM Council as the highest policy making body in the country; the Council is chaired by the Prime Minster at the federal level and by the Chief Minister at Province; the mayor or chairperson of local levels lead the local disaster management committees; the Council has the authority to endorse the DRRM policies to its

implementation at all levels are the prime features of the DRRM Act. It also recognizes a separate entity - the National Disaster Risk Reduction and Management Authority to take charge of disaster risk management. There are specialist committees to provide technical expertise on matters related to DRM planning, response and recovery. All tiers of government should have disaster management funds that they manage. There is a need to report DRRM activities on an annual basis and make it public for transparency and reflect the efforts made in DRRM.

Nepal is now well positioned to address the challenges that an uncertain climate and its fragile geological setting impose through Disaster Risk Reduction National Strategic Plan of Action (2018-2030) framework where all sections of society are able to work together and build on each other's efforts by creating synergy. The approach paper for current 15th Periodic Plan (2019/20-2023/24) also has emphasized the disaster risk management issues as an inherited character of sustainable development and has accorded priority to prepare secure and resilient Nepal.

1.1 **Nepal Specific**

Nepal is a landlocked country, which borders India to the east, west and south and to the north with China. Central part and north parts are hilly area with the Himalayas ranges, whereas southern part is covered with the plain area called 'Tarai'. The total Land area of Nepal is 147,181 square kilometers, whereas the population of Nepal as of the census day (June 22, 2011) stands at 26,494,504 showing population growth rate of 1.35 per annum. Sex ratio (number of males per 100 females) at the national level is 94.2. Similarly, total number of households in the country is 5,427,302 with 5,423,297 individual households and 4,005 institutional households (Barracks, Hostels, Monasteries etc). Nearly ten percent (9.94 %) of total households live in houses with the foundation having RCC pillar, 17.57 percent households in house with foundation made up of cement-bonded bricks, 24.9 percent in wooden pillar, 44.21 percent in mud-bonded bricks and 2.33 in other type of foundations. In urban areas, 28.42 percent of the households live in houses with the foundation having RCC pillars.

The population comprises of different ethnicities, races and language, being 81.34 percent Hindu, 9.04 Buddha, 4.39 percent Islam, 3.05 percent Kirat and 1.42 percent Christian. Nepal has all six seasons, the famous rainy season is in June to August and the winter is between December to February. The capital city of Nepal is Kathmandu, where only the capital about 3 million peoples are living. It is situated between the latitudes of 26'22''to 30'27''north and the longitudes of 8004'to 880012'' east. Nepal spreads 145 to 241 Kilometers from north to south and 885 kilometers from east to west. It is located in South Asia between China and India covering 0.3% of Asia and 0.03% of the earth. (These all data has been derived from National Population Census, 2011)

1.2 Geography

Nepal is characterized by rugged topography, variable climatic conditions, complex geological structure with active tectonic process and continued seismic activities. The rise and the fall of the country lies from 60 meter in plane area to 8848 meter at Mount Everest in the north within a short horizontal distance of 145 to 241 Kilometers. The sharp vertical landscape renders the country highly vulnerable to potential water induced disasters like landslide, slope failure, soil erosion and debris flow. Such short descending

order of the land provided the water current very fast, creating the possibility of heavy erosion of the soil from mountain. Nepal is divided into five physiographic regions which are almost parallel to each other, running from west to east. They are categorically recognized as high Himalayan region, high mountain, middle mountain, Siwaliks (land in between plane and mountain) and Terai (plane area). However, in common phrasing, Himalaya, Mountain hills and Tarai is generally used, respectively covering 15%, 68% and 17% of the total land area.

1.3 Administrative Division

After the promulgation of new constitution, Nepal is declared a Federal Democratic Republic in 2015 dividing the country into seven provinces, 77 districts and 753 municipalities and rural municipalities. It has removed the older development regions and zones. The new system has mostly kept all the 75 districts same with few changes on the boundaries of some districts to create 2 more districts in the country. The urbanization is increasing high due to migration and center centric development activities. According to the Economic Survey 2014-015, Nepal's urban papulation is 38.26%, which was almost 20% in 2011

1.4 Demography

The country has approximately 26.6 million populations with annual growth rate of 1.35 percent average (Population Census 2011). Nepal is the 41st most populous, 93rd largest country by landmass and 102nd largest economy of the world (UN Statistics Division 2017). It has diversity with several race, caste, tribes, rituals, ethnicity, religion and languages. That means Nepal is multilingual, multicultural, multi-religious, and multiethnic society. Nepal is diverse linguistic heritage evolved from four major languages groups – Indo Aryan, Tibeto Barmen, Mangolian, and Indigenous language isolates. Nepal is a combination of 102 ethnics, 92 linguistic and 6 religious people living with the social harmony and unity. The Nepalese population is consisting of indo Aryan and Mongol races. Religiously, the overwhelming populations are Hindus followed by Buddhist, Islam, Kirat, Christians and the others. In March 2008 Nepal is declared as a secular state.

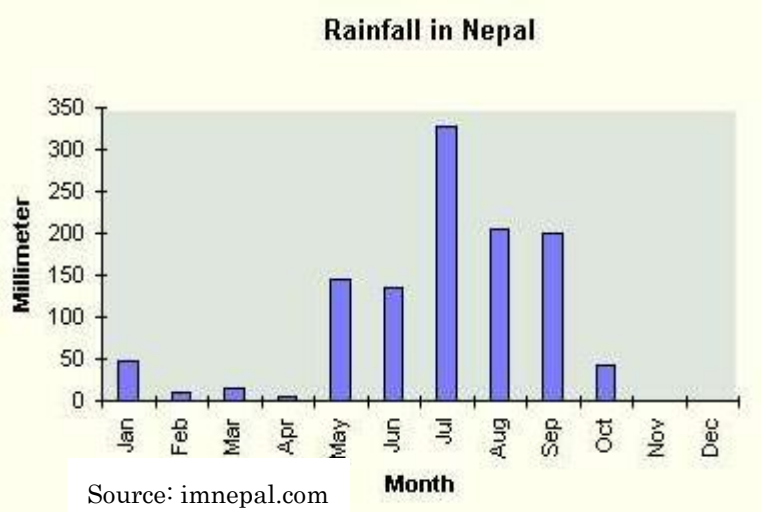
1.5 Socio-economic formation

Nepal's life expectancy at birth has reached to 69.1 at 2013 (Environment Statics of Nepal, 2013 by CBS, Nepal) with adult literacy rate (15-24 years) of 86.5 per cent (CBS, 2009) whereas the literacy rate of 5 and above age group is 65.9% only (CBS, 2011). Some other social indicators like net enrolment rate in primary education is 93.7 per cent (DOE, 2009), population below poverty line is 25.2 percent (CBS, 2011), human development index of Nepal is 0.579 (UNDP, 2019). Annual Economic Growth Rate of Nepal is estimated 7.0 percent in 2018(Economic Survey 2018-19, MoF) while the consumer price Inflation rate was 4.2 percent. At the same time, the per capita income is estimated to reach NRs. 1,17,455 (US $ 1034) in FY 2018/19 (Economic Survey 2018-19, MoF). Total GDP for the year 2017(at the producers' price) of Nepal is estimated NRs.3464.31 billion with Agriculture sector around 27 per cent and non-agriculture sectors contributing around 73 per cent the total GDP (Economic Survey 2018-19, MoF). The data from education, health, communication, physical infrastructure, energy and reconstruction works after the earthquake have signposted that good foundation is being prepared for social and physical infrastructure development.

1.6 Climate

Climatic condition varies in Nepal within a short distance primarily due to its variation in altitude and different type of topography, along with the distances of its corners. The various in climate has created contrasting habitats, vegetation, flora and fauna. The average annual rainfall is about 1,600 mm (mean annual precipitation varies from more than 4,000 mm along the southern slopes of the Annapurna Himalayan range to less than 250 mm in the rain-shadow areas near Tibetan plateau, about 80% of which falls between June to September in the form of summer monsoon. The rainfall is much higher in east part of Nepal then the west part, but the sudden and heavy rainfall can be experience in the west part.

Nepal has five climatic condition /zones from subtropical to arctic broadly corresponding to the altitudes. The tropical and subtropical zone lies below 1200 meters, the temperate zone 1200 to 2400 meters, the cold zone 2400 to 3600 meters, the subarctic zone 3600 to 4400 meters, and the arctic zone above 4400 meters. Nepal has four major seasons comprises winter (December-February), spring (March-May), summer (June-August), autumn (September-November). The Terai and the Siwalik hill range poses sub-tropical climate and the northern mountainous regions have cold, dry continental and alpine winter climate. Summer and late spring temperatures range from about 28^0 C in the hilly region to more than 40^0 C in the Terai. In winter, average maximum and minimum temperatures in the Terai range from a brisk 7^0 C to a mild 23^0 C respectively. The central valleys experience a minimum temperature often falling below the freezing point. Much colder temperatures prevail at higher elevations.

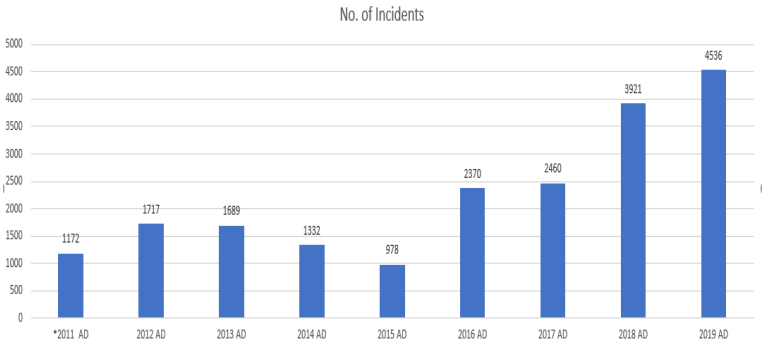


Source: imnepal.com

2. Disaster Profiles in Nepal

The fragile geology and steep topography has made Nepal the 20th topmost disaster prone country in the world. Among 200 countries, Nepal ranks 4th, 11th and 30th with regard to relative vulnerability to climate change, earthquake and flood hazards respectively. It faces high magnitudes and intensities of a multitude of natural hazards such as flood, landslide, earthquake, fire, cold waves, hailstone, windstorm, thunderbolt, cloudburst, drought, Glacier lake outburst flood (GLOF), avalanches and epidemics. Unstable steep slopes and fragile geological formation of a young mountain range with heavy monsoon rainfall leads to a wide range of geological and hydro-meteorological disasters across the country. The variation in geological characteristics, together with torrential rain during rainy season, result in landslides, debris flows, floods, etc.

Apart from these, several other human-induced disasters are reported in the country, Nepal is affected by many natural hazard. The recent data shows that the frequency of natural disasters such as floods, landslides and fire have increased, especially during past three decades and could be attributed to uncontrolled development, environmental degradation or human interventions. Evidence has suggested that the human interventions can increase or decrease the frequency or severity of certain types of hazards such as landslides, floods, drought, etc. or cause hazards that were not previously experienced. With the ever increasing growth of population, safe land is in scarce and there is a greater tendency for people to occupy marginal lands thereby increasing their susceptibility to hazards.



Source: NEOC, MoHA Number of Years

Historical records show that Nepal has been suffering from various types of disaster. The entire country is prone to earthquake as well. While the hilly areas, with rough topography and very young geology, are very prone to landslides, the lowland Terai is prone to floods. Avalanches, GLOFs and snowstorms are common in high hills of Nepal. The biggest recorded disasters in Nepal are the earthquakes of 1934, 1988, 2015 and the floods of 1993, 2008, 2012, 2014 and 2017 in addition to the Jajarkot diarrhea outbreak of 2009. The avalanches experienced in 2012, where huge flood triggered by avalanches kill around 72 people in one time.

After the mega earthquake of 1934, the Great Gorkha Earthquake 2015 put the country again in many shocks. There are many phenomenon related to the geological, ecological, demographic and hydro-meteorological system causing disaster in Nepal. Unplanned settlements, high-degree of environmental degradation, climate change, fragility of landmass, wider spread poverty, steep and diverged topography, poor construction and building practices, low level of enforcement of building codes, insufficient emergency preparedness and awareness, lack of political willingness and various form of societal misinterpretations are major contributing factors to disaster vulnerability in Nepal.

2.1 Disaster scenario

Disaster scenario in Nepal Loss of lives by major types of disasters in Nepal from 1971 to 2011

Event	Data Cards	Deaths	Injured	Missing	Houses Destroyed	Houses Damaged	Affected
Accident	1314	1280	491	202	5	473	2509
Avalanche	104	234	99	45	32	33	1298
Biological	18	0	0	0	0	0	0
Boat capsize	146	284	154	541	0	0	410
Cold wave	458	595	83	0	0	0	2393
Drought	161	0	0	0	0	0	1625
Earthquake	212	882	7024	0	34810	57004	39596

Epidemic	3452	16566	43076	0	0	0	514535
Explosion	46	34	91	0	4	1	19
Famine	28	10	0	0	0	0	589957
Fire	5264	1328	1200	186	72367	1932	264114
Flood	3520	3329	523	663	95944	89934	3935933
Forest fire	187	65	45	410	1835	2	16392
Frost	1	0	0	0	2	0	5
Hail storm	725	65	100	2	208	1635	210963
Heat wave	46	42	20	0	0	0	381
Landslide	2908	4476	1589	626	18491	33960	574020
Leak	1	0	0	0	1	0	0
Liquefaction	1	0	0	0	1	2	16
Other	97	77	64	11	68	0	11982
Panic	6	89	121	0	0	0	0
Plague	326	11	0	0	0	0	50
Pollution	12	0	0	0	0	0	1000
Rains	243	88	44	3	740	1858	66921
Sedimentation	1	0	0	0	0	0	0
Snow storm	195	88	44	828	102	59	12950
Storm	123	52	283	2	1022	566	2397
Strong wind	456	171	480	0	2013	7443	38815
Struct.collapse	425	414	643	8	1282	623	2671
Thunderstorm	1175	1091	2111	1	328	465	8447

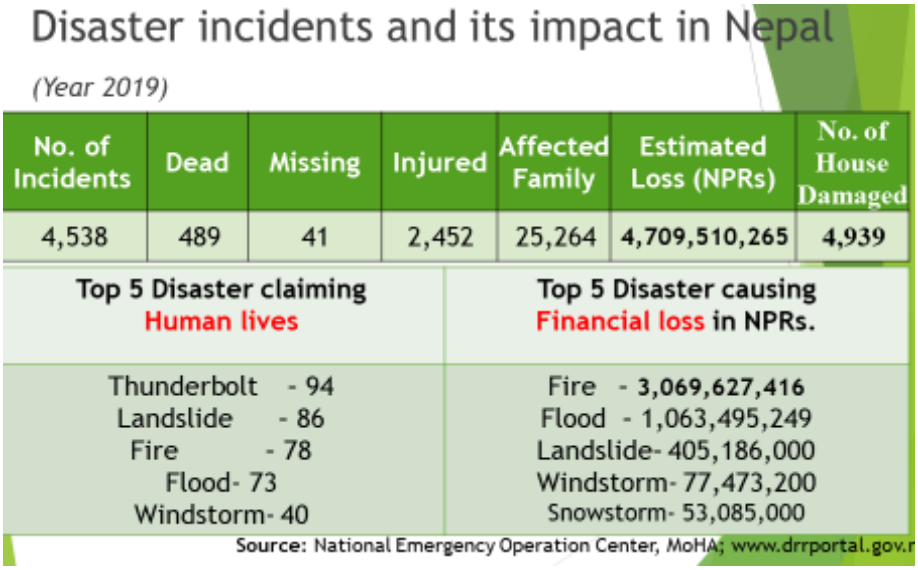
(Source: DisInventar, 2012, data from 1971 to 2011)

Major Disaster Loss and Damage Scenario from 2011 to 2019, Nepal

Type of Incidents	No of Incidents	Deaths	Missing	Injured	Houses		Economic Loss (NRs*) in Million
					Partial Damage	Complete Damaged	
Earthquake	85	8969	195	22302	302806	775793	706461
Thunderbolt	1889	913	1	2347	175	122	52
Landslide	1628	903	233	770	2452	2382	1667
Flood	1504	752	477	167	41827	11082	16643
Fire	12583	594	0	1628	2229	15378	17512
Cold Wave	116	116	0	0	0	0	0
Epidemic	75	95	0	1916	0	0	2
Heavy Rainfall	884	81	1	214	384	601	326
High Altitude	82	77	0	13	0	0	0
Wind storm	510	75	0	1428	3742	2068	167
Storm	67	63	7	46	132	103	11
Animal Incidents	391	58	0	240	321	19	11

Boat Capsize	32	50	48	45	0	0	0
Snake Bite	60	44	0	17	0	0	0
Flash Flood	3	43	32	0	0	31	11
Avalanche	19	40	20	23	0	1	0
Snow Storm	5	12	0	0	0	0	53
Other^	236	125	12	213	71	12	40
Total	**20,169**	**13,010**	**1,026**	**31,369**	**354,139**	**807,592**	**742,956**
Source: drrportal.gov.np		^ sinkhole, hailstorm, hailstone, bridge collapse and others					* 1USD=114NRs

This table clearly indicates the average per year disaster incidents and the loss of lives and property in a year. Here, it is seemed that fire, in terms of economic loss, has become a major disaster in the recent year followed by flood and landslides. Thunderbolt being a high frequency incident took most lives in this year.



2.2 Landslide and Debris flow

The movement of earth, rock or debris down slope under the influence of gravity by certain processes is considered as a landslide. Landslide usually occurs as secondary effects of heavy rainfall and earthquakes. In so many cases, the landslide has occurred in Nepal even if there is small amount of rainfall, but it was continuous for weeks. After finishing the landslide, the higher level of sun shining has usually triggered the landslide. A debris flow is slurry of soils, rocks and organic matter combined with air and water. The causes of landslide in Nepal are natural as well as manmade. In general, the middle hills are prone to landslides. The natural phenomena like heavy rainfall, active geotectonic movements, deforestation and disturbance of hill slopes are also the major causes for occurring landslides. When the water level in Nepal's over 6,000 rivers and creeks, flowing north to south, swells up

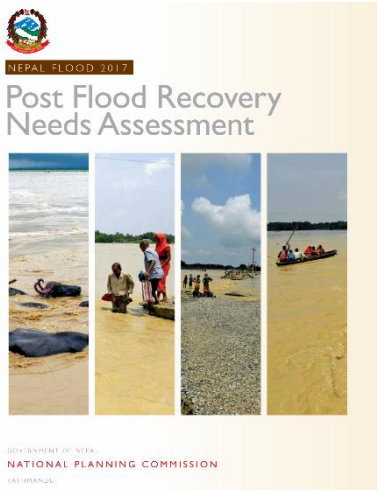
Satyawati Gulmi Landslide 2019 killed 12

during the monsoon(June-September) season, they wreak havoc in the downstream communities of the plains. Extreme and incessant rainfall trigger massive landslides in a comparatively weak topography of the hilly region. In average, landslides kill 100 persons every year in Nepal (MoHA, 2020). Sometimes extreme even happens, for example even in Aug 5, 2014, the mass landslide occurred in the Sindupalchok District, claiming Sunkoshi River Blocked and taking life of 156 people, making it the deadliest to hit the Himalayan nation in three decades. The landslide has also created a dangerous blockage of the Sunkoshi River, stoking fears of floods downstream in neighboring India's Bihar state, where the river is known as Koshi. The landslide also damaged part of the Arniko Highway linking Kathmandu with the Tibetan capital Lhasa, stranding more than 500 foreign hikers and their guides. Similarly, twelve persons were feared dead after landslides triggered by heavy rains struck three places of Satyawati Rural Municipality in Gulmi, western Nepal, on july 24, 2019.These types of phenomenon is common in Nepal, seeking special attraction from stakeholders.

2.3 Floods and Inundation

The topographical feature of Nepal is mainly responsible for flood. Flood is caused by heavy precipitation, which may occur at any place except high Himalayan region during the monsoon season. Inundation along the river banks and erosion of land along the riverbanks causes loss by damaging irrigation and communications facilities and fertile lands across or adjacent to the riverbanks. Such phenomenon has caused loss of 79 lives and huge amount of property in mountainous areas of Nepal every year (MoHA, 2020). It also poses severe hazards to physical infrastructure like roads and bridges. Inundations have disrupted social and economic development of many parts of terrain region in the country. The floods of August 2008 in Koshi river, September 2008 in Western Nepal and July and August 1993 in the Bagmati and other rivers were devastating floods in Nepal. Nepal has observed Monsoon flood as well as Flash flood. Rainfall variability (unequal rainfall in time and space), topography (steep Mountain and flat Tarai), Deforestation (decreasing vegetative cover) are the major factors contributing to the floods in Nepal. Similarly, Inundation caused by floods and heavy rainfall is another major frequent disaster in Nepal. It takes an average of nine lives (MoHA, 2020) with making heavy loss and damages on crops and settlements in plane areas almost every year.

In the year 2017, flood spanned the entire breadth of the country. A total of 35 districts were affected of which 18 of them severely. More than 190,000 houses were destroyed or partially damaged, displacing tens of thousands of people and rendering many homeless. Household assets and food grains were damaged and the affected communities faced shortage of food, water and non-food items. Many suffered infections from contaminated water. In comparison to the past floods in 2001 and 2008, which killed 1,673 people, the 2017 floods saw reduced mortality and injuries. The number of people who died in the 18 most affected districts was 134 of which 44 were female. The districts where most of the deaths



occurred are as follows: Rautahat, Morang, Jhapa and Sarlahi. The number of recorded injuries caused by the floods this year was only 22. In the severely affected 18 districts, the floods affected around 1.7 million people (866,993 males and 821,480 females).

(Source: Post flood Recovery Needs Assessment Report, National Planning Commission Nepal, 2017)

2.4 Earthquake

The Nepali people are living in a country of highest seismic hazard, have faced the consequences of many earthquakes including those of great earthquakes. 45 million years ago, the Indian continent collided

into Southern Tibet. The Indian continent is driven under Tibet, pushing lightweight sediments upwards and thus the formation of the Himalayas. Nepal lies across the boundary between India and southern Tibet which are still moving towards each other by 2 meters per century. This movement creates pressure within the Earth, which builds up and can only be released through earthquakes. This is the only way earthquakes can happen in Nepal and it is considered as 11th most earthquake-prone country in the world. Based on the seismic record of the number of earthquakes that occurred since 1255, earthquakes of magnitude greater than 8 occurred on average once every 80 years. The last great earthquake of magnitude 8.3 occurred in 1934 resulted in more than 10,000 deaths in the Kathmandu Valley. Most of the infrastructure and major heritage sites had to be rebuilt. The seismic record of Nepal is available since 1255 AD in which 7.7 reactor scale in Kathmandu valley one third of population, including king Avaya Malla, lost their lives in this event. After that, a series of earthquake occurred in Nepal. Major are in 1260, 1408, 1681, 1767, 1810, 1823, 1833, 1834, 1866, 1934, 1980, 1988, 2011 and 2015 AD. According to the seismological center of Nepal medium and small size earthquake event occur in a different part of Nepal frequently. According to Global Earthquake Initiatives, Kathmandu is exposed to the greatest earthquake risk capital among 21 megacities around the world, largely due to building collapse and insufficient preparedness and insufficiency of medical care. If an earthquake of the 1934 magnitude is reported at this point of time, an estimated 40,000 deaths, 90,000 injured and 6, 00,000 to 9, 00,000 homeless can be expected.

On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre (NSC), struck Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years. The catastrophic earthquake was followed by more than 300 aftershocks greater than magnitude 4.0 (as of 7 June 2015). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the first big one with the epicenter near Mount Everest. To date, there are over 8,790 casualties and 22,300 injuries. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. Thirty-one of the country's 75 districts have been affected, out of which 14 were declared 'crisis-hit' for the purpose of prioritizing rescue and relief operations;

another 17 neighbouring districts are partially affected. The destruction was widespread covering residential and government buildings, heritage sites, schools and health posts, rural roads, bridges, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities. The geodetic network centres including horizontal and vertical control points have been damaged in a manner that will affect reconstruction planning. Rural areas in the central and western regions were particularly devastated and further isolated due to road damage and obstructions. In the worst hit areas, entire settlements, including popular tourist destinations like Langtang, were swept away by landslides and avalanches triggered by the earthquakes. Due to the weakened, ruptured, and destabilized slopes and surfaces, the vulnerable areas have now become even more susceptible to flooding and landslides that can occur during the monsoon. 2 Hundreds of historical and cultural monuments at least a century old were either destroyed or extensively damaged. Over half a million houses were destroyed. The damage exposed the weaknesses of houses that did not have any seismic-resistant features or were not in accordance with the building codes. The disaster also highlighted aspects of inequities in Nepali society spanning geography, income and gender. Poorer rural areas have been more adversely affected than towns and cities due to their inferior quality of houses. More women and girls died than men and boys, partly because of gendered roles that disproportionately assign indoor chores to women. The time and day the first earthquake was experienced saved thousands of lives. Being a Saturday, the weekly holiday, schools across Nepal were closed on 25 April. The death toll of young people could have been much higher considering that nearly 7,000 schools were completely or significantly damaged. Similarly, if the earthquake had struck at night, and not in the middle of the day, there would certainly have been greater casualties.

Loss and damage by 2015 Gorkha Earthquake, Nepal

	Disaster Effects (NPR million)			Distribution of Disaster Effects (NPR million)		Losses in personal income (NPR million)
	Damages	Losses	Total	Private	Public	
Social Sectors	**355,028**	**53,597**	**408,625**	**363,248**	**45,377**	-
Housing and Human Settlements	303,632	46,908	350,540	350,540	-	-
Health	6,422	1,122	7,544	1,394	6,150	-
Education	28,064	3,254	31,318	2,365	28,953	-
Cultural Heritage	16,910	2,313	19,223	8,948	10,274	-
Productive Sectors	**58,074**	**120,046**	**178,121**	**158,079**	**20,043**	**17,124**
Agriculture	16,405	11,962	28,366	25,813	2,553	4,603
Irrigation	383	-	383	-	383	
Commerce	9,015	7,938	16,953	16,953	-	2,667
Industry	8,394	10,877	19,271	19,271	-	3,654
Tourism	18,863	62,379	81,242	75,105	6,137	6,200
Finance	5,015	26,890	31,905	20,937	10,969	-
Infrastructure Sectors	**52,460**	**14,323**	**66,783**	**17,281**	**49,502**	
Electricity	17,807	3,435	21,242	15,569	5,673	-
Communications	3,610	5,085	8,695	1,712	6,983	
Community Infrastructure	3,349	-	3,349	-	3,349	-
Transport	17,188	4,930	22,118	-	22,118	
Water and Sanitation	10,506	873	11,379	-	11,379	-
Cross-Cutting Issues	**51,872**	**1,061**	**52,933**	**1,755**	**51,178**	-
Governance	18,757	-	18,757	-	18,757	-
Disaster Risk Reduction	155	-	155	-	155	-
Environment and Forestry	32,960	1,061	34,021	1,755	32,267	-
Total	**517,434**	**189,027**	**706,461**	**540,362**	**166,100**	**17,124**
Total (US$ million)	**$5,174**	**$1,890**	**$7,065**	**$5,404**	**$1,661**	**$171**

Source: Post Disaster Needs Assessment 2015; National Planning Commission

2.5 Fire

Fire is a recurring disaster in Nepal. During the dry season from February to May, large numbers of incident of fire are reported, mostly in the Terai where about three quarter of houses are built with thatched roofs.

Forest fires occur throughout Nepal and result deforestation of around 1.7 per cent of the total forest area annually. These fires cause economic losses and environmental degradation throwing dedicates ecosystems out of balance. It is also threatening valuable and endangered flora and fauna, degrading the soil and inducing flood and landslide. Most of the fire incidents are caused by negligence of the people. Hunting practices, negligence by cigarette smoker, intentional fire to accelerate growth of grasses to feed livestock, intentional fire setting by herb and charcoal collectors and children playing with fires are some of the reasons for forest fires. Certain type of trees especially Sal (shores Robusta) is particularly susceptible to fire. About 63 per cent of the population of the country inhabit in the rural areas mainly in thatched houses closely clustered where fire hazards are likely to be common.

2.6 Glacial Lake Outburst Flood (GLOF)

Glacial lakes are like natural water reservoirs dammed by ice or moraines. Lake outburst can be triggered by several factors: ice or rock avalanches, the collapse of the moraine dam due to the melting of ice buried within, the washing out of fine material by springs flowing through the (piping) earthquakes or sudden inputs of water into the lake e.g. through heavy rains or drainage from lakes further up glacier. ICIMODs 2001 inventory of glaciers, glacial lakes and GLOFs counted 3252 glaciers and 2323 glaciers lakes in Nepal 20 of which are very vulnerable to flooding (MoHA, 2009). GLOF affects high Himalayan region as well as downstream by extremely damages of lives and properties. Major events shown in past were Tamor Koshi (1980), Sun Kosi (1935, 1981), Dudh Kosi (1977, 1985), Arun (1968, 1969, 1970) etc.

Early warning system is established at some lakes to minimize the effect of GLOF in Nepal

2.7 Drought

In Nepal, most of the country is in the grip of drought-like condition from the end of March till the monsoon arrives next in June, but the districts like Manang and Mustang in the Trans-Himalayan region are extremely dry throughout the year and the Terai and western hills are more frequently affected than other regions. Drought results in crop failures and famine, both during the monsoon season and rest of the year, when winter crops are sown. About 5,000 families living in pockets in the hills and Terai are badly affected by drought each year (MoHA, 2009). Planned land use with crop rotation, rain water harvesting, drought monitoring, using recycle water, developing irrigation system, water rationing are some of the strategy which help to minimize impact of drought.

2.8 Others

Due to diarrhea about 300 people has died in June and July month of 2009 in Midwestern part of the country. The monsoon season is always in the threat of the epidemic of diarrhea in Nepal. Some other kind of disasters are drought, hailstone, thunderbolt, avalanche, boat capsize, structure collapse, cold wave, hot wave, swine flu, bird flu, encephalitis, meningitis is common during hot and rainy season. The lightening, hailstorm are other natural disaster. The data presented above has shown the different figure that there are about 100 people has been killed by the lightening only. The sudden avalanche and heavy snow fall in winter

season sometimes cause heavy loss of human lives and properties. Road accident and Aircraft accidents are also major source of disaster in Nepal. In Nepal, road accidents are one of the top causes of death. Aircraft accidents are happening in hilly terrain and areas with extreme climatic condition.

3. Legal and Institutional Arrangements

3.1 The Constitution of Nepal, 2015

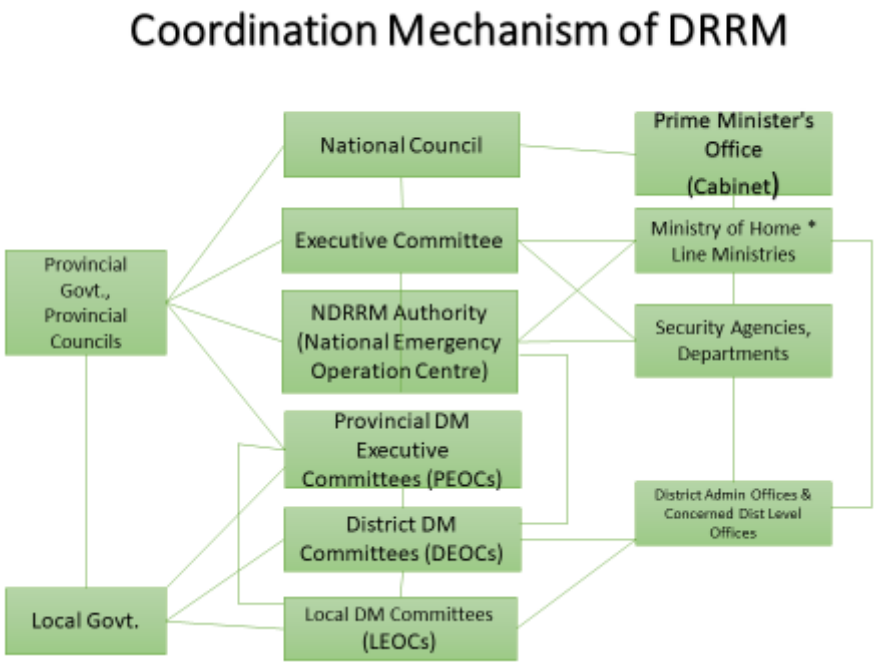
For the very first time, disaster management is identified in the Constitution. It underscores the ownership and priority of the state in managing disasters with an emphasis on early warning, disaster preparedness, rescue, relief and rehabilitation for preventing water induced disasters, developing sustainable and reliable irrigation through river management and minimizing the risks from disasters. Schedule 7 of the Constitution has listed natural and human induced disaster preparedness, rescue, relief and rehabilitation activities in the concurrent powers of Federal and Provincial governments. Similarly, Schedule 8 has listed disaster management as sole responsibility of the local government and Schedule 9 has included it in the concurrent powers of all tiers of governments. Disaster risk management is identified as one of the key responsibilities of all tiers of government.

3.2 Disaster Risk Reduction and Management Act, 2017

Disaster Risk Reduction and Management (DRRM) Act was enacted in 2017 replaces the 1982 Natural Calamity (Relief) Act. Under this law, disaster management committees will be formed at the Provincial, District and Municipal levels. The act reinforces the government's efforts to bring disaster risk management initiatives to a new height. It puts emphasis on risk reduction over response; the legislation creates the DRRM Council as the highest policy making body in the country. The council chaired by the Prime Minster at the federal level and by the Chief Minister at Province are responsible for plan policy approval, guidance and direction, monitoring as well as evaluation to the lower levels at their capacity. The Minister for Home Affairs heads the executive committee and it is responsible for the implementation of approved plans and policies throughout the nation, whereas the Province Minister for Internal Affairs and Law leads the execution at province level. The Chief District Officer leads the district level committee and the mayor or chairperson of local levels lead the local disaster management committees. The National Council has the authority to endorse the DRRM policies to its implementation at all levels are the prime features of the DRRM Act. It also recognizes a separate entity - the National Disaster Risk Reduction and Management Authority (NDRRMA) to take charge of disaster risk management. There are specialist committees to provide technical expertise on matters related to DRM planning, response and recovery. All tiers of government should have disaster management funds that they manage. There is a need to report DRRM activities on an annual basis and make it public for transparency and reflect the efforts made in DRRM.

The figure below clearly revels the proper institution arrangement for disaster management, but this still does not reflect the all cycles of disaster management placing the role of Ministry Health, Federal Affairs and General Administration, Ministry of Urban Development, Ministry of Energy and other relevant ministries as well.

The disaster management councils and committees in all levels are inclusive of all main sectors of life including political and humanitarian actors of the society. The Act also empowers the government to declare the state of emergency during the intensive disaster. It also furnishes some special rights to the disaster manager for managing rescue and relief work in an effective and efficient manner. It also empowers the government to allocate for dedicated fund at central to local level as a Disaster Management Fund for delivering effective risk reduction, relief and rescue functions before, during and after disaster.



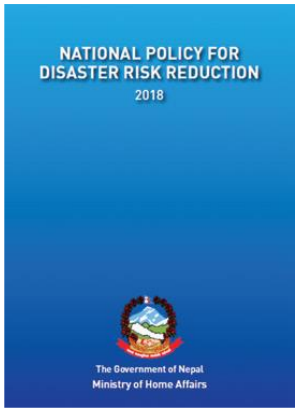
3.3 Local Governance Operation Act, 2017

Guided by the Constitution, the Local Government Operation Act, 2017 has replaced the Local Governance Act of 1999. The 2017 Act identified the functions for all aspects of disaster risk reduction under the duty, responsibility and rights of rural and urban municipalities. It also included the activities related to grant permission of building construction, monitoring and evaluation as per the National Building Code and Standard including the policy, planning, program formulation, implementation, monitoring, regulation and evaluation etc. regarding DRR to develop safer communities.

3.4 Public Health Act, 2018

Public Health Act is the pioneer Act for ensuring effective, regular, quality, and easy access to health care and free basic and emergency health services to all. It requires all health facilities to provide emergency health care services mandatorily and follow referral mechanisms. It has envisioned on reducing the impact on public health by food, pollution, hygiene and waste management, industries and urbanization, public health friendly public infrastructure and safety. It also ensures the emergency medical service and management through ready-to-deploy health teams. It includes a mandatory provision for all tiers of governments to have emergency medical response plans. It also has a provision for local levels to declare a public health emergency in their jurisdiction and recommend the Government of Nepal to control and reduce its impact according to the scale of public health emergency.

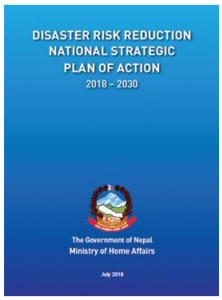
3.5 National Policy for Disaster Risk Reduction, 2018



The National Policy for DRR 2018 has been prepared and endorsed to build a safer, adaptive and resilient nation by reducing the existing risks and prevention of new and potential risks. The policy considers the national needs as well as international agreements and obligations, which is more focused on achieving the targets and commitments made in the Sendai Framework for Disaster Risk Reduction, the Sustainable Development Goals, and the Paris Convention on Climate Change. It has identified 59 activities to cover all sectors and designated roles and responsibilities to sector ministries to carry out sectoral activities.

3.6 National DRR Strategic Plan of Action (2018-2030)

The National DRR Strategic Plan of Action (2018-2030), inspired by the Sendai Framework for Disaster Risk Reduction-SFDRR 2015-2030 has adopted a holistic approach to uphold sustainable development by mainstreaming disaster risk reduction in the development process. Based on SFDRR's guiding principle, this action plan has identified 4 priority areas and 18 priority actions. Under each priority action, the strategic activities are identified for 2018 to 2020 as short-term interventions, 2018 to 2025 as mid-term interventions, 2018 to 2030 as long-term interventions and continuous actions.



This Strategic Plan of Action has set the targets for reducing disaster loss considering the targets set by the Sustainable Development Goals 2030 in terms of substantially reducing the impact of disasters nationally. It aims to reduce the disaster mortality rate, reduce the number of disaster affected people, reduce the direct economic loss in GDP from disasters, reduce the damage to critical infrastructure and disruption of basic services enhancing resilience, developing DRM strategies and action plans at the provincial and local levels. And substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments. The substantial reduction of disaster risk and loss of lives, the economic, physical, social, cultural and environmental assets of persons, businesses, and communities of the country are key targets focused on reducing the impact of disaster.

3.7 Fifteenth Periodic Plan (2019-2023)

Disaster management programs were first included in the 10th national plan (2002-2007) of the government of Nepal, this emphasis has gone to ascending orders until the current periodic plan (2019/20-2023/24) that has emphasized the disaster management as separate topic and also has tried to mainstream the disaster risk reduction and management with various line items topics. It has also prioritized disaster risk management as an inherited character of sustainable development and has given priority to disaster risk reduction accordingly. The federal government with coordination to all tiers of government through this plan aims safe and resilient Nepal by focusing disaster risk reduction activities as well as response and relief functions. Evidence based disaster resilient governance system, integration of disaster management in all phases and dimensions of development, investment through public, private and community partnership are

the main objectives of this plan. The plan has also adopted the policy to carry out a special program on capacity building for emergency search, rescue, treatment and immediate relief.

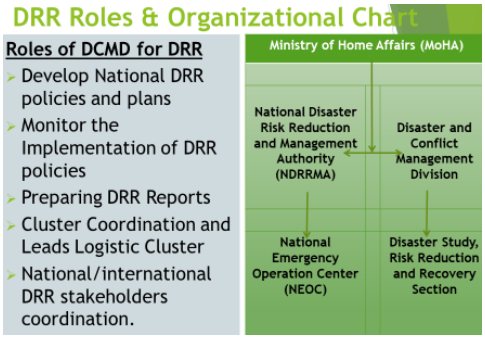
3.8 Other Laws, Policies and Guidelines

There are lot more Acts, Rules, Regulations and Guidelines, directly related to, just related to and indirectly related to the disaster management. Some of them are Act relating to Reconstruction of Earthquake Affected Structures, 2015, Soil and watershed conversation act, 1982, Nepal building Act, 1998 and Nepal National Building Code, 2015 and Environmental protection Act, 2019. National agriculture policy, 2004, National shelter policy, 2012, National urban policy, 2006, policies related to water plan and some strategies related to health and infrastructure sectors are also considered as majors in the area of disaster management in Nepal.

Similarly, Post Disaster Recovery Framework (2016 – 2020) by National Reconstruction Authority, Emergency Relief Standards for Disaster Affected People, 2007, Standard Operating Procedures of Emergency Operation Center, 2010, District Disaster Preparedness and Response Planning Guidelines, 2011, Search and Rescue Strategic Action Plan, 2014, Guidelines for the Relocation and Rehabilitation of High Risked Settlements, 2018, Standard Operating Procedures of Ware House (National and Provincial), 2018, Dead body Management Guidelines 2011 (amendment 2019), National Disaster Response Framework, 2013 (amendment, 2019), Standard for Emergency Communication System for Tiered Integration and Operation, 2019 are some more legal arrangements related to mitigation, preparedness, rescue, relief, reconstruction and rehabilitation on disaster management in Nepal.

3.9 Ministry of Home Affairs, Ministry of Federal Affairs and General Administration, Line ministries and their agencies

Ministry of Home Affairs (MoHA) acts as National Focal Agency on Disaster Management and lead agency responsible for implementation of the Disaster Risk Reduction and Management Act, 2017. The MoHA is also responsible for rescue and relief work, data collection and dissemination, as well as collection and distribution of funds and resources. It is also the leading agency for logistics management in case of the disaster beyond the capacity of the provincial and local governments. The assigned task was being implemented through Disaster Preparedness and Response Section, National Emergency Operation Centre-NEOC, in the ministry. Now, after the establishment of NDRRMA, this center comes within the new Authority under the ministry. The ministry has also a separate division for Disaster and Conflict Management with Disaster Study, Risk Reduction and Recovery Section within. The ministry is working for new organization and management at the new context.



Ministry of Federal Affairs and General Administration (MoFAGA) is the nodal ministry for the local governments to the federal government. It deals and coordinates all the aspects of disaster management issues at the local level for their functions as per the local governance act 2017. It is responsible for early recovery activities after huge disaster.

Similarly,

- Ministry of Urban Development, responsible lead ministry for recovery and shelter.
- Ministry of Energy, Water Resource and Irrigation for energy, dam, embankment, irrigation and related other disaster management activities including hydrology and meteorology.
- Ministry of Defense for search and rescue, multinational military coordination and assistance.
- Ministry of Physical Infrastructure and Transportation for related risk reduction, response and recovery.
- Ministry of Education, Science and Technology for related activities of DRRM cycle.
- Ministry of Health and Population for emergency medical care and nutrition.
- Ministry of Agriculture and Livestock Development for food security and related other activities of the DRRM cycle.
- Ministry of Forest and Environment for forest, timber supply and land related disaster management activities. It also deals with climate crisis.
- Ministry of Communication and Information Technology for emergency communication.
- Ministry of Water Supply for water, sanitation and hygiene.
- Ministry for Women, Children and Senior Citizens is responsible for protection activities.
- Relief and Treatment Sub-Committee, headed by federal affairs and local development minister and Supply, Shelter and Rehabilitation Subcommittee headed by urban development minister as two major sub-committee directly working with the CNDRC
- Department of Hydrology and Meteorology deals with the related study, information and the dissemination of those information including early warnings to the authorities and public.
- Department for Water Induced Disaster Prevention deals for related DRR and mitigation.
- Department of Mines and Geology works for Earthquakes study and related for DRRM.
- Other Ministries and Departments of the Government of Nepal are also responsible for disaster crisis management at their capacities.

3.10 National Disaster Risk Reduction and Management Authority (NDRRMA)

After longtime advocacy and discussion, a separate and dedicated entity to address disaster issues in Nepal was first time legislated in DRRM Act in 2017 and it is now established as the National Disaster Risk Reduction and Management Authority after the endorsement of National Disaster Risk Reduction and Management Regulation, 2019. The newly borne authority is working for its further structure, scope and functions. The primary role of this authority is to operationalize the disaster risk and management functions, making necessary arrangements for regular coordination with stakeholders, carry out response operations, search and rescue, relief, early recovery, recovery plan and implement disaster related programs. This authority is also responsible to regulate risk reduction related activities and will have an incident commander in emergency.

3.11 Province Governments and Local Levels

As per the existing legal provisions on DRR, the provincial governments have taken charge of managing disasters as a primary task. Some of the provincial governments (Province No. 1, 2, and Bagmati

Province) have developed their own disaster management act, while others are still under consultation and progressing towards finalization. Provincial governments in coordination with District Disaster Management Committees (DDMC) are coordinating, facilitating and guiding the local levels in risk reduction initiatives, and the mainstreaming the development efforts by applying mitigating and preventive measures.

As envisioned by the Constitution, the local governments assumed their responsibilities following the election in 2017 in the federal set up. The federal and provincial governments came into effect in the beginning of 2018. The critical concerns of local governments are to meet the expectations of people on the priority issues, development initiatives and effective governance, where DRM could be a crucial issue for sustainable development. In a very short period (less than a year), the provincial governments and local level initiatives on DRRM remained inspiring. The local level governments have prioritized DRRM in their respective jurisdictions. Three out of seven provincial governments and around 83 out of the 753 local levels have developed local disaster management committees, 77 of which has established disaster management funds, 45 each have formed disaster management acts and policies, and only 19 comes up with local disaster risk reduction strategic action plan. Other remaining local levels are in the process of formulating other supportive policies, guidelines, standards and other guidance regarding response, relief and recovery, fund mobilization, assessment and monitoring, recovery and rehabilitation, among others. They have also responded to a number of disaster events and provided relief to the affected families and the responses from the elected representatives have found to be more effective than before. The provincial and local governments have demonstrated their ownership and responsiveness to disaster risk reduction and management as a core business in less than one year of its institutional set up. (Source: Nepal Disaster Report 2019, MoHA)

3.12 Nepal Risk Reduction Consortium

A Consortium was formed in May 2009 to support the Government of Nepal till 2015, to develop a long term Disaster Risk Reduction Action Plan building on the National Strategy for Disaster Risk Management (NSDRM). Members of the Consortium are Department of International Development UK (DFID), the Asian Development Bank (ADB), the International Federation of the Red Cross and Red Crescent Societies (IFRC), United Nations Development Program (UNDP), UN Office for the Coordination of Humanitarian Affairs (OCHA), UN International Strategy for Disaster Reduction (ISDR) and the World Bank. the Indian Government and Japan International Cooperation Agency has joined the Consortium as an observer. In addition, the Consortium initiated a multi-stakeholder participatory process with the Government of Nepal and civil society organizations to identify short to medium term disaster risk reduction priorities that are both urgent and viable within institutional and policy arrangements in the country. Based on the priorities set by then government and discussions with multi-stakeholder groups, five flagship areas of immediate action for disaster risk management in Nepal were started. The estimated total budget of the three-year Flagship Programs was US $131.1 million.

In developing the programme, the priorities outlined in the 'Hyogo Framework of Action 2005-2015, Building the Resilience of Nations and Communities to Disasters', and the Outcomes of the Global Platform for Disaster Risk Reduction (2009), which sets out specific targets for reducing losses from disasters, were taken into account. On 19 March 2010 the Government formally established the Nepal Risk Reduction Consortium (NRRC) Steering Committee, chaired by the Secretary of Home Affairs. Members include the Joint Secretaries of the Ministries of Finance, Education, Irrigation, Local Development, Physical Planning, Health and Population, and the National Planning Commission. Directors and Representatives of the ADB, WB, UNDP, OCHA, IFRC, NRCS, and DP-Net are also members. The Joint Secretary of MoHA is Member Secretary. The concept of Consortium is not working smoothly now days. However, a meeting and some discussions were held at MoHA last year.

3.13 Executive Committee for DRRM

Executive Committee for Disaster Risk Reduction and Management is the apex executive body headed by home minister responsible for the execution or cause to the execution of the plan, policies and program approved by the National Council. This committee is composed of the Ministers for the Urban Development, Health and Federal Affairs; Secretaries for all the Ministries including Cabinet Office; Lieutenant General of Nepali Army, Chief of Police Forces, Director of the National Bank, Member Secretary from the Social Welfare Council, Chairpersons from the Telecom Authority, Nepal Chamber of Commerce, Nepal Red Cross Society, Federations of Nepalese Chamber of Commerce and Industries and the Executive Chief of the NDRRMA as the member secretary for the committee.

The function, duty and right of Executive Committee are as follow:

(a) Prepare and submit national policy and plan relating to disaster management to the Council,

(b) Within the limit of the approved national policy and plan by the Council, integrated and sector wise policy, plan and program relating to disaster risk reduction, disaster response and disaster recovery shall be approved, and executed or caused to be executed,

(c) Strategic plan and program relating to disaster management shall be approved and executed or caused to be executed,

(d) Ascertain roles to abide by all agencies including public, private and non-governmental organization relating to disaster management, and also make those agencies to include disaster management related matters in their policies, plan and program,

(e) Ascertain roles and responsibilities of the ministries, departments and other agencies of the Government of Nepal relating to disaster management,

(f) Build or caused to be built the institutional capacity of the Federal, Provincial, District and Local level relating to disaster management,

(g)Include the matters relating to disaster management in the curriculum from school to higher levels of education,

(h)Formulations of cluster wise contingency plan for disaster risk reduction and execute or caused to be executed,

(i)To reduce probable risk of natural disaster, identify areas that are at risk and conduct or caused to be

conducted risk and vulnerability mapping of such area,
(j) Prepare risk sensitive development and land use plan, and implement or caused to be implemented,
(k) Carry out or caused to carried out disaster risk assessment of public infrastructures, (l) Relocate or caused to be relocated the people and communities residing along river bank, landslide prone steep-sloping lands and inundation prone areas or any other disaster risk prone area to safe locations,
(m) Formulate special plan and program for women, children, senior citizen, dalit, marginalized group and community, people with disabilities who are at disaster risk, and execute or
caused to be executed,
(n) Identify the most vulnerable communities and execute or caused to be executed the risk reduction programs,
(o) Develop and operate or caused to be developed and operated the national early warning system,
(p) Formulation of national disaster response framework for disaster response, and execute or caused to be executed,
(q) Make arrangement for immediate relief distribution to the disaster affected,
(r) Formulate necessary working procedure and standard so as to automatically mobilized institutional mechanisms for immediately carried out primary functions including search, rescue and relief during disaster, and execute or caused to be executed,
(s) Make provision of emergency treatment to disaster victim through the arrangement of adequate infrastructure and services in public and private hospitals or health institutions,
(t) Develop necessary standard relating to the roles of mass media during disaster and execute or caused to be executed,
(u) Provide suggestions to the Government of Nepal on the matters of national policy relating to immigration, custom and quarantine to be adopted during disaster,
(v) Carry out or caused to be carried out the programs for recovery of economic activities, creation of employment opportunities, and income generation activities for livelihood,
(w) Carry out or caused to be carried out the programs relating to disaster recovery in the disaster affected areas,
(x) Mobilize or caused to be mobilized international, bilateral and multilateral assistance to be received for disaster management within the jurisdiction of prevailing laws,
(y) Execute or caused to be executed other works relating to disaster management as prescribed by Government of Nepal or Council,
(z) Execute or caused to be executed other works relating to disaster management as prescribed.
(Source: DRRM Act, 2015)

3.14 Province Disaster Executive Committee/ District Disaster Management Committee/ Local Disaster Management Committee

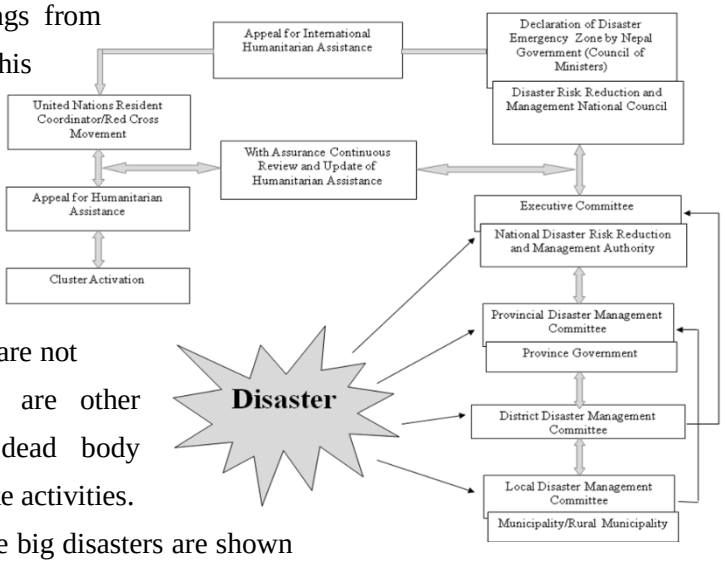
A 15 membered Province Disaster Management Executive Committee (PDMEC) is present in each seven provinces of Nepal and chaired by the Province Minister for Internal Affairs and Law. The composition of the committee and members is as per the Province Law. Generally, it comprises related

government agencies and security agencies (law and order, emergency response and development institutions) along with voluntary organizations such as Red Cross. It is responsible for formulating the policies and plans for the respective provinces within the umbrella of National policies and laws. The implementation is done in coordination of District Disaster Management Committee (DDMC) and Local Disaster Management Committee (LDMC).

All 77 DDMCs are responsible for district level disaster preparedness and response planning and implementation. They are also responsible for all the activities related to DRR Cycle including SAR and immediate relief. The chairperson of the DDMC is the Chief District Officer (CDO), who is the highest-level government official to take disaster-related decisions at the district level. This committee comprises of the Mayors from the local levels, various line agencies such as law and order, emergency response (police and armed police), district chapter of NRCS and critical facilities such as irrigation, road, livestock, health etc. That's why it is also a main coordinating body amongst all level of governments for the district level.
The Local Disaster Management Committee (LDMC) is 15 membered committee is all 753 local levels of Nepal. This committee is headed by the Mayor or Chief of the local level and its composition will be as per local law. This committee is responsible for disaster risk reduction and management at the local level, such as risk mapping, resettlements, disbursement of funds during and after emergencies, and rescue, identification and transport of the injured to hospitals. This committee is guided by the DRRM Act, 1015 and local laws. As per the Local Governance Operation Act, 2015. the local level has the right to exercise the disaster risk reduction, mitigation, response, relief and recovery activities. So, the LDMC will work for all the local level activities for DRR cycle including curriculum development and community mobilizations with their own plans within the national guidelines.

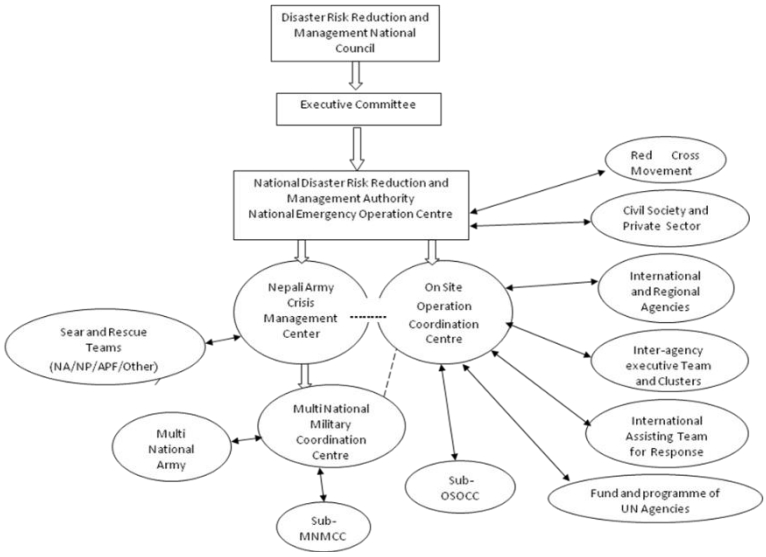
4. Response Policy and Frameworks

National Disaster Response Framework (NDRF), 2013 has been revised by Executive Committee for DRR in 2019. It has incorporated the new legal arrangements after the promulgation of Constitution of Nepal, 2015. It also insets the learnings from devastating Gorkha Earthquake 2015. This framework is to response the disaster beyond the capacities of provincial and local governments in coordination with District Disaster Management Committee (DDMC). However, the provisions for province and local levels are not displayed in this framework. There are other guidelines for search and rescue, dead body management, resettlements and relief like activities. The assistance and coordination after the big disasters are shown in the figure. After disaster, executive committee meeting immediately takes decision about the intensity,



severity and the possible out brakes. At the same time, the committee compares national capacity for response, and if the national capacity does not meet the necessity, it urges the Council or Government to appeal international humanitarian assistance.

Nepal is practicing clusters approach for disaster response and recovery, NDRF is the guiding provision to humanitarian agencies as well. Level of disaster determines the mobilize of Humanitarian Agency/Organization. United Nations Resident Coordinator (UNRC) will coordinate with international community to mobilize response activities. Activation of Red Cross Movement On-Site Operation and Coordination Centre (OSOCC) will activate as per the necessity. Establish Multi National Military Coordination Centre (MNMCC) to coordinate with international Search and Rescue (SAR) groups. The Government of Nepal makes the decision as per necessity when disaster struck. The mechanism after international appeal is shown in the framework. In case of incountry capacity mobilization, the framework for coordination and response is similar excluding the OSOCC and MNMCC. In both senerai the coordiantion goes through National Disaster Risk Reduction and Managent Authority(NDRRMA)



NDRF: when appealed for international humanitarian assistance

Clusters	Lead/co-leads
Logistics	MOHA /WFP
Health	MOHP /WHO
WASH	MOUD/ Unicef
Nutrition	MOHP/Unicef
Emergency Shelter	MOUD/ IFRC/UNHBITAT
Camp Coordination & Camp Management	MOUD/IOM
Food Security	MOALD/WFP
Education	MOEST/ Unicef/Save the Children
Protection	MOWCSC/UNHCR/Unicef/UNFPA
Emergency Telecommunication-MOCIT/WFP	
Early Recovery	MOFAGA/ UNDP

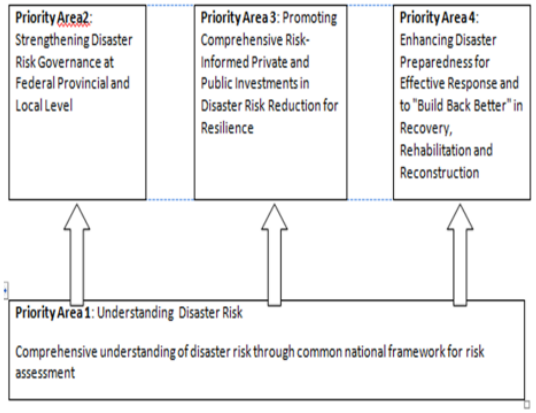
The 11 clusters, which should always be prepared and vibrant to response disasters. The clusters are led by related ministries and co-led by the UN agencies and international humanitarian agencies. They are responsible for mobilizing their clusters themselves and can call related agencies or authorities in their meetings for better preparedness and response. These clusters will be activated and mobilized by NDRRMA with necerray coordiantion.

5. Sendai Framework for Disaster Risk Reduction(SFDRR) Updates in Nepal

Nepal is a signatory country to SFDRR 2015-2030 followed by Hyogo Framework for Actions-HFA 2005. It has already expressed a commitment to achieve the SFDRR goals by 2030. So far, Nepal has

submitted two SFDRR progress-monitoring reports. It has clearly prepared the priorities through its action plans and has started their implementation phase wise.

The GoN developed and endorsed Disaster Risk Reduction National Strategic Plan of Action (2018- 2030), as Nepal's roadmap to implement the key provisions of SFDRR in our context. The Strategic Plan of Action has a long-term vision to build a safer, adaptive and resilient nation from disaster risk and ensure sustainable development.



Nepal, being a hazard prone country, has been taking collective action to prevent new and reduce existing disaster risks. This will be accomplished through the implementation of integrated and inclusive economic, structural, legal, environmental, technological and institutional measures. Such concerted effort will be instrumental to prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience of the country. The Strategic Plan of Action has set four priority areas in line with SFDRR priorities.

5.1 Priority Area 1: Understanding Disaster Risk

To understand the level of disaster risk is essential for policy makers and other stakeholders working with DRM. An extensive disaster risk assessment and a well-maintained information management system to foresee disaster risk and updated information of disaster loss and damages should be in place. Under the Priority 1, MoHA has initiated activities on all four priority areas. Currently, Nepal has a regular mechanism for collecting information and regularly updates disaster loss and damages, response and recovery initiatives. MoHA is leading the process to map and consolidate various multi-hazard risk assessments done by a number of agencies over the past years with the objective of establishing a uniform and comprehensive disaster information management system (DIMS). DIMS will serve as a repository of disaster information from all levels: local, provincial and federal. This system is expected to be live and interactive information management system for DRM in Nepal. In order to ensure the common sharing platform, it will serve as a common system for disaster management fostering data partnership at multiple tiers of governments and relevant stakeholders. A strong linkage will be established among the institutions and agencies involved in forecasting, managing and accessing the risks and responses.

Some of the vulnerable settlements have been identified for relocation as per the risk exposed. Different levels of capacity development programs are taking place ranging from security forces to government officials, federal to local authorities and practitioners, non-government actors to communities are supporting to enhance the disaster risk understanding. But, it still needs to be standardized and institutionalized in the respective levels. Seismic stations, hydro-metrological stations, lightning detection centers have been established for real-time hazard risk monitoring system at different parts, throughout the

country. Kathmandu valley soil liquefaction map has been prepared. All the major glacier lakes monitoring and regular assessment system has been developed which feeds the real time information.

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

The state can ensure disaster risk governance through incorporation and ownership of the disaster risk reduction components and their governance system priorities. The mainstreaming of disaster risk management in development initiatives, strengthening institutional capacities, preparedness for reducing existing risk and preventing new risk along with risk-informed governance systems can reduce the impact and pave the way towards resilient communities.

The disaster risk governance primarily entails the establishment of mechanisms, institutions and processes for effective DRM. Furthermore, it includes the ability of all level of Government to use those mechanisms and institutions for disaster preparedness, response and recovery activities. In the current federal set up, most of the provincial and local governments have given priority to disaster risk reduction and management. They have developed policies, laws, plans and formed committees, institutional structures and disaster funds, and are already engaged in disaster preparedness and response initiatives. Disaster management councils at national and provincial level and committees at local and community level have been formed to lead the disaster management at various levels. Federal government is dedicated to accomplish all targets of Priority Area 2 within the short span of time. The localization of the act, policies and Strategic Plan of Action follows a participatory approach with engagement of key stakeholders at various levels. EOCs are being expanded at the provincial and local levels. In order to strengthen institutional capacity for effective disaster risk governance, the government has been maintaining close partnership with the non-governmental sectors and humanitarian actors across all levels. The DRRM act and policies ensures the inclusiveness of vulnerable groups in different phases of disaster, from participation in preparedness to prioritization of services in response and recovery. Nepal has adopted Sustainable Development Goals by replicating it to our context through the sustainable development agenda of Nepal identifying the responsible authorities with the targets to accomplish. Nepal also has adopted and localized SFDRR by developing National DRR Strategic Plan of Action 2018-2030, which has identified 271 priority activities for reducing the disaster risk. The coordination level has been enhanced with the dedicated desk in the federal ministries and departments and DRR focal persons are identified at each level of all tiers of government. In the provinces there are separate unit under ministry of internal affairs and law. Emergency Operation Centers (EOC) have been established to strengthen the response effort at national, provincial, district, local levels as well as at sectoral levels too. DRM and climate adaptation program has

Source: NEOC, MoHA, 2019

been mainstreamed in the development plans to reduce the impact as well as mitigations measures applied to reduce further risk.

5.3 Priority Area 3: Promoting Comprehensive Risk-Informed Private and Public Investments in Disaster Risk Reduction for Resilience

The state is responsible for enabling environment for preparedness and response to disasters, bringing all stakeholders together. All tiers of governments have maintained disaster funds at each level for preparedness and emergency responses. However, due to lack of a comprehensive law on the fund management, checking for duplication and the coordination of relief support is a challenge faced by the governments. Under this priority action, a number of ongoing recovery efforts to 2015 earthquake and 2017 flood demonstrate good examples of the private and public investments in disaster risk reduction for resilience. For further engagement of private sector in disaster management, consultation and discussion on the possible areas of substantive partnership in risk reduction are being held. The organized efforts with the use of security forces, volunteers, students, experienced and skilled human resources of government and non-government sectors in preparedness can further contribute to an enhanced and effective response. Open spaces have been identified within Kathmandu Valley as a safe places for displaced population in post disaster scenario assuring them with preparedness of basic facilities required in the aftermath. Disaster management funds have been allocated at all tiers of government typically for effective and immediate response and relief after any major events. Support of private sector has been increasing in the response and recovery phase, but there are still some rooms to motivate them to encouraging their support in risk reduction programs. MoHA has taken the lead and has started discussion with the wider stakeholder to establish the risk transfer mechanism. Existing insurance system as health insurance, livestock insurance, other social security provisions could be tied up together to transfer the risk.

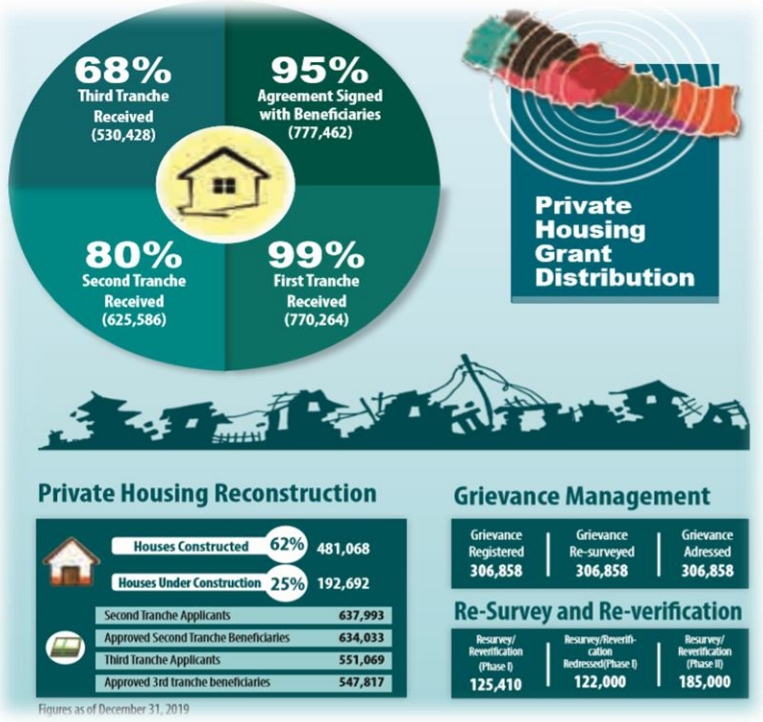
5.4 Priority Area 4: Enhancing Disaster Preparedness for Effective Response and to "Build Back Better" in Recovery, Rehabilitation and Reconstruction

The National Reconstruction Authority is leading the reconstruction efforts of the government as per the Rehabilitation Policy and Post Disaster Recovery Framework. Primarily, it intended to support affected communities to bounce back rapidly to normalcy, and to ensure safety and resilience to future shocks. Reconstruction efforts focused on developing a well-planned, resilient settlement in the earthquake affected districts ensuring safe structures, social cohesion, access to services, livelihood support and capacity building of the community and develop resilient critical infrastructure and cultural heritages.

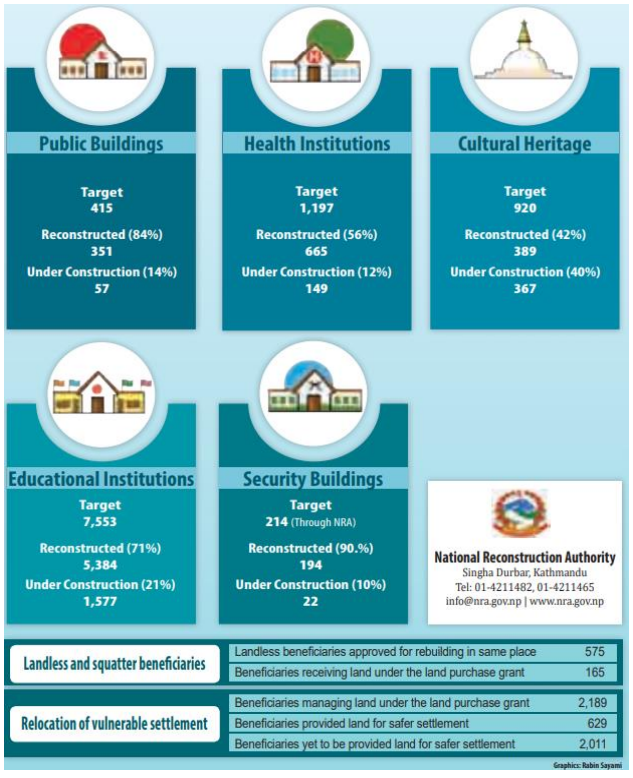
Under the Priority 4, Nepal has initiated its 6 priority actions. NRA has provided people with reconstruction needs with multiple options of architectural design to construct their new houses that has allowed them to ensure safer house reconstructed with quality materials in close supervision of engineers by following "Build Back Better" principle. The individual house reconstruction drastically went above 42 percent from 7 percent in two years' period, where there is remarkable progress on reconstruction of government buildings including schools and health facilities above 50 percent, though there is very little progress on cultural heritage and security forces infrastructure reconstruction with 30 percent progress on an average. SAR capacity has increased, as security forces developed their institutional capacity, logistics

requirements and started producing skilled human resources from their own disaster schools. Local levels are conducting a number of community-based disaster activities including comprehensive DRM activities on mitigation and prevention of disaster risk at local levels. They cover a wide range of activities by identifying the risks in a particular community to reduce its impact and exposure.

Similarly, Nepal has initiated preparedness in airports for disasters. Regular simulations based on the plan are carried out in Tribhuvan International Airport by Civil Aviation Authority of Nepal (CAAN). Domestic airports are also developing their contingency plans. Regular simulations have been carried out jointly with the engagement of both civil, security agencies and public. For emergency response, emergency items are stockpiled in strategic locations. Humanitarian Staging Area at TIA and forward logistic bases are being constructed at the provincial level. Search and rescue items are being upgraded and expanded to cover more areas with the intention to reach the community level. Regular updates of heavy equipment located in the strategic locations keeps it ready for deployment in emergencies. Capacity and resources of trauma centers are being enhanced regularly. National Trauma Center in Kathmandu, trauma centers at Bharatpur Hospital, Chitawan in East-West Highway and Dhaulagiri Zonal Hospital, Baglung at Mid-Hill Highway are providing trauma care services, while others are in the process.



Cultivating a culture of safety is crucial for risk reduction and saving lives in emergencies. Incorporation of disaster risk management in both formal and non-formal education system helps the cause. Curriculum development consultation is being carried out during the period. There are number of ongoing activities to develop early warning systems and forecast the anticipated disasters, by which the government along with



communities and individuals can prepare themselves to avoid risk. Efforts are focused on expansion of weather stations and achieving higher precision in monitoring and forecasting. Alert messaging has been delivered more frequently among the target audience through various media. DoHS have established a mechanism to prevent possible epidemics and outbreaks of diseases through the use of Early Warning and Reporting System and Integrated Disease Surveillance System. During the period, there has been remarkable progress in establishing and strengthening coherence from global to national, and national to sub-national (province and local) level. Gradual implementation of the priority-based disaster risk reduction activities including: risk identification and assessment, strengthening disaster governance at three tiers of government, mobilization of public and private investments in risk reduction and emergency management, and significant progress on reconstruction of damages caused by 2015 Earthquake.

6. Challenges and the way forward in the area of DRRM in Nepal

6.1 Mainstreaming DRRM

- The new legal instruments of Nepal acknowledge the incorporation of DRR into development plans. However, what are reflected and underscored in the plans and activities of all three tiers of governments are not substantiated in their annual programs and budgets.
- One of the reasons for this is lack of tools to assess contribution of an investment in development sectors towards disaster resiliency of a community and/or nation.
- The other challenge is the understanding our risk of different geographies, different communities, different hazards and different economic activities while scientific risk assessments are very limited. At this point, lack of common understanding between and within the new governance system stands as another challenge.

6.2 Institutional strengthening and capacity building

- The emergency response and relief approach is so entrenched in the current system that it will take time to mobilize the system to more comprehensive disaster risk management approach.
- The new policy and act are gearing up the efforts towards changing the existing mindset.
- National Disaster Risk Reduction and Management Authority is newly established as a separate and robust mechanism to assess disaster resiliency and contribution toward disaster resiliency of the communities and the nation. Its scope, functions, organization and management are yet to be confirmed.
- The new policy and act has authorized the government to arrange and mobilize sufficient budget with straight mechanism to spend on mitigation, preparedness and recovery.
- The new legal and policy frameworks are expected to empower the government to undertake preparedness of better emergency response in effective way.
- Although emergency response has been the main thrust of the disaster risk management in the previous years, it was basically ‘wait and see’ approach with spontaneous reactions to provide rescue and relief.
- SOPs and standards have not been fully developed, institutional mechanisms are in need of

strengthening.

- There is need to develop network of EOC across the country from central to local level with proper linkages at the basis of needs and expectations.
- Some of the provincial and local governments are making laws and establishing some institutional arrangements but overlapping, lack of uniformity and common understanding are becoming the new challenges ahead.

6.3 Other challenges

- Information, technology and knowledge gap on the practical aspects of the DRRM
- Lack of adequate coherence in different national and international instruments
- Prevalence of new forms disaster, urbanization, unprecedented disaster.
- Aligning DRRM landscape with political transformation
- Uncertainty of risk due to climate change.
- Trans-boundary nature of hazards and need of bilateral, international efforts.
- Ensuring inclusiveness for disaster risk reduction and management for capacity enhancement as well as justice and equity.
- Proper utilization of financial and other resources and the capacity available internally and externally with transparency.

6.4 Way forward

Substantive progress has been achieved towards establishment of the NDRRMA. Establishment of authority has become significant milestone towards disaster governance in Nepal. Finalization of the scope, organizational and functions of this authority is the priority of the days. Progress on localization of policies, institutions, and resources at sub-national level is highly commendable. It is equally important to ensure that there is coherence among the policies and their subsequent implementation. A close and proactive engagement of all tiers of governments and related stakeholders needs to be further strengthened to this end. As per the legal provision, disaster management funds have been established in three tiers of governments. However, a specific act on management of the funds would foster clarity and effectiveness while utilizing the fund.

Similarly, other priorities to be followed along with the aforementioned way forward can be mentioned as follows:

- Better understanding of disaster risk through scientific research and comprehensive risk assessment.
- Formulation of additional necessary DRR policy measures, strategies, guidelines by 2020. (Land use plan, Early warning System etc.)
- Institutional arrangements and set up of institutional structures (such as NDRRMA, EOCs) with the efficiency of stockpiled warehouses and equipment.
- Implement actions of Strategic Action Plan - complete short-term, and initiate and complete long term as appropriate. (Building code).
- Bilateral and international cooperation regarding our priorities. (International support for technological transfer, knowledge management).

- Empowering province and local governments for effective leadership role in disaster risk management.
- Ensure meaningful participation of women, children, and persons with disability, minority and vulnerable groups in the overall DRR program decisions and implementation for better resiliency. Children can enhance of "Culture of Safety".
- Develop international fund for DRR in developing countries.
- Provide and share more data and evidence on the benefits of investing in preparedness to ensure effective and integrated implementation of DIMS.
- The disaster resilient livelihood options need to be promoted to strengthen community resilience.
- Ensure appropriate technologies and innovations are in place to have the bigger improvement on overall DRRM of the country.
- Develop multi hazard SAR capacity at all levels, from local to global.
- There is an increasing trend of disaster related displacements in Nepal which may be further accelerated by the impact of climate change. Appropriate policy legislation and implementation on disaster displacement would reduce the associated risks.
- Development and implementation of measurable monitoring tools, tied with financial rewards and restrictions, is necessary to achieve goals of the strategies.

7. Conclusion

Nepal disaster risk management initiatives have become remarkable with the constitutional provision and enactment of DRRM Act, 2015. The legal and policy provisions outlined in the report marked the paradigm shift in disaster management in Nepal. The shift focuses on strengthening legal frameworks, policy and planning, organizational aspects, institutional capacities and partnerships for DRM, over the years. Nepal has been steered by the principles of disaster risk reduction and allocated tasks to the three-tiers of government with sole and concurrent responsibility for disaster management according to current legislation. The provisions have provided the tiers with roles and responsibilities for disaster risk management.

The Disaster Risk Reduction National Strategic Plan of Action 2018-2030, framed within the objectives of the act and SFDRR, took forward the strategic priorities and actions that guide disaster risk reduction initiatives in Nepal. Nepal should focus its initiatives on effective implementation of National DRR Strategic Plan of Action (2018-2030) to meet the international obligations as well as making Nepal resilient to any disaster.

The reported incidences of disasters show water induced disaster claiming the majority of loss and damages in Nepal. Other seasonal disasters including fire incurred significantly higher economic losses and fire incidents are much more concentrated in urban areas.

Localization of policies, resources, capacities and institutions were key priorities during the period. There has been substantial progress in establishing disaster risk management funds, and remarkable progress towards meeting the agenda of localization of strategies at sub-national and local level.

As per the challenges faced during the implementation of the objectives set by the disaster risk reduction policies and priorities, there has been important lessons learnt that guide strategies and actions for future endeavors.

8. ADRC Counterpart

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Abbreviations

ADB	Asian Development Bank
ADRC	Asian Disaster Reduction Centre
APF	Armed Police Force
CAAN	Civil Aviation Authority of Nepal
CBS	Central Bureau of Statistics
CCCM	Camp Coordination and Camp Management
CDO	Chief District Officer
DEOC	District Emergency Operation Centre
DDMC	District Disaster Management Committee
DHM	Department of Hydrology and Meteorology
DIMS	Disaster Information Management System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DOE	Department of Education
EOC	Emergency Operation Center
DoHS	Department of Health Services
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Floods
HFA	Hyogo Framework for Action
ICIMOD	International Centre for Integrated Mountain Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IOM	International Organization for Migration
INSARAG	International Search and Rescue Advisory Group

LEOC	Local Emergency Operation Centre
OSOCC	On-Site Operation Coordination Center
MNMCC	Multi National Military Coordination Center
MoF	Ministry of Finance
MoFAGA	Ministry of Federal Affairs and General Administration
MoHA	Ministry of Home Affairs
NA	Nepali Army
NACRIMAC	Nepali Army Crisis Management Center
NDRRMA	National Disaster Risk Reduction and Management Authority
NEOC	National Emergency Operation Center
NP	Nepal Police
NPC	National Planning Commission
NRA	National Reconstruction Authority
NRCS	Nepal Red Cross Society
NRs	Nepali Rupees (Currency)
NSC	National Seismological Centre
NSDRM	National Strategy for Disaster Risk Management
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PEOC	Province Emergency Operation Centre
SAR	Search and Rescue
SC	Save the Children
SFDRR	Sendai Framework for Disaster Risk Reduction
SMS	Short Message Service
SOP	Standard Operating Procedure
Sub-OSOCC	Sub-On-Site Operation Coordination Center
Sub-MNMCC	Sub-Multi National Military Coordination Center
TIA	Trivubhan International Airport, Kathmandu
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UNDAC	United Nations Disaster Assessment and Coordination Team
UN Habitat	United Nations Habitat
UNHCR	United Nations High Commissioner for Refugees
UNFPA	United Nations Population Fund
USAR	Urban Search and Rescue
WASH	Water, Sanitation and Hygiene
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

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