

# Country Report

## Disaster Management in Nepal With Reference to Environment

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**ABSTRACT:** Nepal is prone to various types of disasters: floods, landslides, fires, epidemics, avalanches, earthquakes, windstorms, hailstorms, lightning, glacier lake outburst floods and droughts. The various government reports over the last 28 years have shown that each year, floods, landslides, fires, windstorm, lightning, avalanches and epidemics kill hundreds of people and destroy property worth billions of dollars. They also have a negative impact on the nation's development agenda. In addition to the above factors, the losses from disasters are increasing in the absence of proactive disaster management policies, laws and preparedness and risk reduction programs. Existing laws that deal with disasters do not address them in totality as the law is limited to immediate disaster response. As a result such focus as does occur is limited to disaster response and relief rather than complete approaches including planning, preparedness and recovery. This paper aims to identify problems in disaster management in Nepal and suggest appropriate policy measures.

**KEYWORDS:** Disasters; Impact; Preparedness; Proactive; Policy; Reduction .

### 1 INTRODUCTION

Nepal, a small and land locked country in South Asia is exposed to multiple hazards due to the variable geo-climatic conditions, young geology, unplanned settlements, deforestation environmental degradation and increasing population. Climate change is one of the key factors for the occurrences of various types of disasters. The vast altitudinal variation within a short span of about 193 km, ranging from 60 meters to 8848 meters above sea level makes the country an abundant storehouse of bio-diversity and ecological niches with diverse agro-climatic zones ranging from the sub-tropical to the alpine and tundra.<sup>11</sup> Apart from the above, environmental degradation, increasing population, rapid and unplanned urbanization and other economic activities in vulnerable areas are other contributing factors to increase hazards. Hence, Nepal is a global hot spot for several types of disasters.<sup>12</sup>

The types of natural and human induced disasters in Nepal are: floods, landslides, fire, epidemics, earthquakes, avalanche, windstorm, hailstorm, lightning, glacier lake outbursts (GLOFs), drought and so on. The main reasons of her vulnerability to the disasters

are - the rugged and fragile geophysical structure, very high peaks, high angle of slopes, complex geology, variable climatic conditions, active tectonic processes, unplanned settlement, increasing population, weak economic condition and low literacy rate. Apart from the above reasons, the lack of coordination among agencies related to disaster management, no clear-cut job description of those agencies, resource constraint, lack of technical manpower, lack of public awareness, difficult geo-physical condition, absence of modern technology and so on are the major factors that have made Nepal incapable to cope with the natural disasters.<sup>9</sup>

The earthquake of 1934 A.D., 1980 A.D. 1988 A.D. and the flood of July, 1993 A.D. are the most devastating natural disasters which not only caused heavy losses of human lives and physical properties but also adversely affected the development process of the country as a whole.<sup>1</sup>

The types of natural and human induced disasters that occur in Nepal and the location are given in the following Table 1.

Table 1. Types of natural and human-induced hazards in Nepal

<i>Types of Hazard</i>	<i>Prevalence</i>
<b>Natural Hazards</b>	
Earthquake	All of Nepal is a high-hazard earthquake zone
Flood	Terai (sheet flood), Middle Hills
Landslide and landslide dam breaks	Hills, Mountains
Debris Flow	Hills and Mountain, severe in areas of elevations greater than 1700 m that are covered by glacial deposits of previous ice-age
Glacier Lakes Outburst Floods (GLOF)	Origin at the tongue of glaciers in Higher Himalayas, Higher Mountains, flow reach down to middle Hill regions
Avalanche	Higher Himalayas
Fire (forest )	Hills and Terai (forest belt at foot of southern-most Hills)
Drought	All over the country
Windstorms	All over the country
Hailstorm	Hills
Lightening	All over the country
<b>Human-Induced Hazards</b>	
Epidemics	Terai and Hills, also in lower parts of Mountain region
Fire (settlements)	Mostly in Terai, also in mid-Hill region
Accidents	Urban areas, along road network
Industrial/Technological Hazards	Urban / industrial areas

Soil erosion	Hills
Social Disruptions	Follows disaster-affected areas and politically disturbed areas

Data from Nepal Country Report: ISDR Global Assessment Report on Poverty and Disaster Risk 2009, UNDP-ISDR, NSET (2010), Table 3.

Please see the Table 2 below for the losses of human lives and property losses due to various types of natural and human induced disasters in Nepal from 1971 to 2011.

Table 2: Occurrence and Effect of Disasters on Human Lives and Property Losses in Nepal 1971-2011

Year	No of Records	No of Deaths	Missing	Injury	Affected Population	Destroyed Houses	Damaged Houses
1971	115	311	2	55	860	131	142
1972	115	173	37	88	902	771	86
1973	207	214	9	317	7846	1957	160
1974	231	507	43	725	19917	2615	859
1975	145	263	38	133	37612	2051	36
1976	234	304	143	93	12002	4957	448
1977	204	162	54	195	6822	1347	462
1978	304	471	401	90	15172	3132	75
1979	204	640	0	114	62025	2061	68
1980	216	423	67	506	8614	14348	13650
1981	178	258	201	434	45513	1246	1004
1982	164	683	19	24	5159	1039	37
1983	171	492	15	122	4197	1384	1207
1984	368	1091	24	611	12418	2568	485
1985	172	229	7	77	5160	1475	63
1986	113	289	0	34	5163	1160	21
1987	121	122	0	68	13548	1041	6115
1988	337	1327	15	8205	3766	23202	41182
1989	303	352	5	1419	20087	4813	1377
1990	207	512	35	4107	7995	1209	1366
1991	415	1097	26	179	53441	1392	202
1992	410	998	63	29	23383	6225	79
1993	889	1812	82	304	653336	21249	21673
1994	427	1175	46	1253	183848	3175	517
1995	416	1158	35	1484	696515	9685	15898
1996	369	1147	98	1579	623216	19638	13923
1997	561	1331	4	944	217599	4549	1046
1998	429	1154	16	304	508900	15978	477
1999	481	1409	40	422	65159	4046	697
2000	664	708	46	342	29770	3038	1810

2001	1211	1902	80	3465	73652	6308	2350
2002	1170	899	105	12081	398748	14059	5479
2003	931	971	86	3438	565002	1974	761
2004	1020	1098	60	224	331929	1617	3339
2005	477	333	101	164	110647	1449	539
2006	524	596	101	5859	9265	1927	8512
2007	877	636	891	4694	86876	9456	1466
2008	1526	944	129	1266	483465	16029	3292
2009	1584	1944	140	1303	377792	3760	9124
2010	1555	839	146	473	143048	4263	8453
2011	1517	859	143	991	376073	7322	7878
<b>Total</b>	<b>21562</b>	<b>31833</b>	<b>3553</b>	<b>58215</b>	<b>6306442</b>	<b>229646</b>	<b>176358</b>

Source: DesInventar, 2012 ; URL: [www.desinventar.net](http://www.desinventar.net), [www.nset.org.np](http://www.nset.org.np); For more detail: NSET

## 2. ENVIRONMENTAL DEGRADATION IN NEPAL

Environmental degradation is a very big problem in Nepal which is growing and causing human health hazard particularly due to the creation or disposal of pollution, sound, heat or wastes. Increasing number of vehicles, garbage and dust particles are the main factors of pollution particularly in city areas resulting into health hazards like bronchitis, soaring throat, asthma, chest infection and lung diseases. According to various studies carried out in the Kathmandu valley - SO<sub>2</sub> has been found up to 202 µg cm<sup>-3</sup> and NO<sub>2</sub> to 126 µg cm<sup>-3</sup> particularly in winter months when a thick layer of fog covers the till 10 am in the morning. All the gases are mixed within the limited air below the fog and the ground. On the other hand, in Kathmandu city alone municipal waste of 500 m<sup>3</sup> a day and also liquid waste dumped directly into the rivers at the rate of 500,000 l d<sup>-1</sup> worsens the situation and makes the city polluted and dirty.<sup>13</sup> The fast population growth has led to a rapid increase in demand for fuel wood, timber, fodder and land to grow more food. Forests were cleared and converted to agriculture and the process is ongoing.<sup>13</sup> Landslide is another contributing factor of environmental degradation.<sup>14</sup> Seventy-five percent of the landslides in Nepal occur naturally.<sup>4</sup> Landslides triggered by both natural and anthropogenic causes in the Mid-hills, have been found that natural large landslides occur at a frequency of 0.2/km<sup>2</sup>, but that this increases to 2.8/km<sup>2</sup> in areas of human interference.<sup>5</sup> In this way environmental degradation is a big problem in Nepal particularly in Kathmandu valley which is causing human health and other hazards particularly due to the air, water, sound, heat, industrial wastes, garbage and pollutions.

The problems stated above and other disguised problems that may be identified through a broad-based analysis hold the key to successful environmental protection in Nepal. Until these fundamental problems and root causes are addressed, success is not likely to be sustainable and the threats will reappear. Therefore, concerted and coordinated efforts are highly desirable from the government with the broad participation of all stakeholders. It is also very necessary to consolidate and build on past successful efforts and additional interventions are required to address the root causes of the major threats to protect Nepal's environment. In addition, since human and financial resources are limited, unflinching criteria should be proposed for ranking problems and root causes should be identified according to their overall impact on environment and priority for remediation.

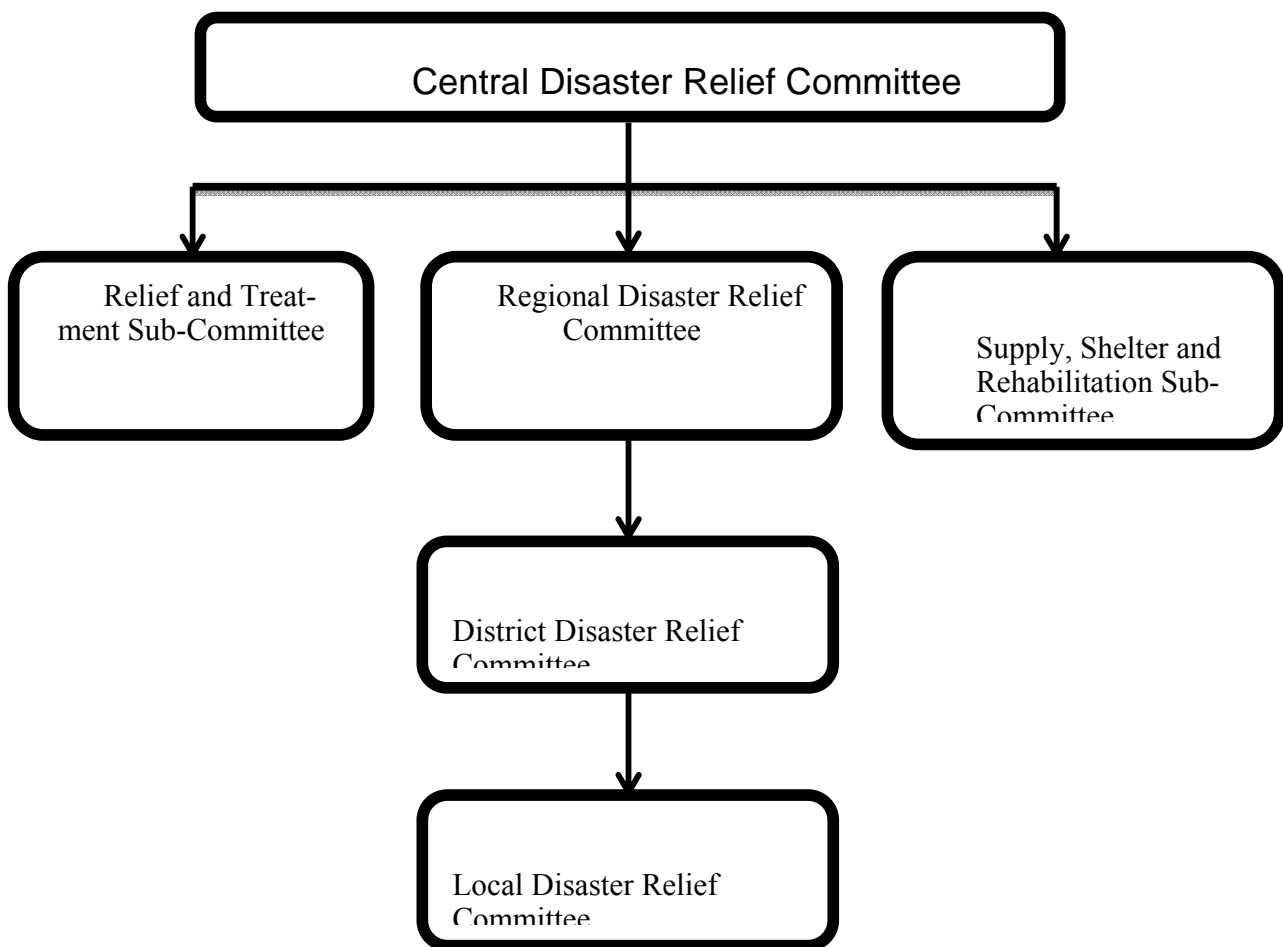
### 3. THE WIND HAZARD

The problems of wind hazards in Nepal have two dimensions namely; natural and human induced. Instead of mitigating and reducing natural hazard, human induced hazards are in increasing trend. Such hazards encompass high rise infrastructures constructed without adopting building codes. Mobile towers and hoarding boards fixed on the top of unsafe and weak buildings and other infrastructures have been found highly vulnerable to wind and earthquake disasters particularly in urban areas. Various studies have shown the threat and drawn the attention of the government, concerned stakeholders and individuals. But, no significant change or improvements have been noticed so far. As a result, strong winds have caused severe damages from time to time to human lives and physical properties each year which is growing year by year.

### 4. ORGANIZATION OF DISASTER MANAGEMENT SYSTEM IN NEPAL

Natural Disaster Relief Act (NDRA), 1982 was endorsed in 1982 A.D. Before the enactment of the Act, disaster management activities were carried out in an ad-hoc basis. Hence, to carry out the disaster management activities properly, NDRA has constituted the following organizational structure:<sup>7</sup>

Figure 1. Organizational Structure



The above figure is adopted from the book of Dr. Meen Poudyal Chhetri.<sup>11</sup>

The above mentioned Central Natural Disaster Relief Committee (CNDRC) has been formed under the chairmanship of the Home Minister which formulates and implements disaster management policies, plans and programs. The Central Committee also prepares specific norms of relief assistance to be given to the disaster affected persons in cash and/or in kind through the District Natural Disaster Relief Committee (DNDRC).<sup>7</sup>

The Central Committee may constitute two Sub-Committees namely; Relief and Treatment Sub-Committee (RTSC) and Supply, Shelter and Rehabilitation Sub-Committee (SSRSC) which provide necessary advice and suggestions to the Central Committee, help to execute policies and directives of the Central Committee and operate effectively the rescue, relief and rehabilitation works.<sup>2</sup>

#### 5. THE ROLE OF THE MINISTRY OF HOME AFFAIRS AS THE FOCAL AGENCY

Being the focal agency for disaster management in Nepal, the Ministry of Home Affairs formulates and implements national disaster policies, plans, programs and activities. Primarily, the Ministry and other stakeholders are responsible to carry out rescue operations and provide relief materials to the disaster affected population. The Ministry is also responsible for disaster preparedness and mitigation, immediate rescue and relief works, data collection and dissemination and mobilization of funds and resources. It has its network throughout the country in the form of the Regional Administration Office, District Administration Office and the District Police Office which are the field offices to carry out rescue and relief works in the time of disasters.<sup>2</sup>

The Ministry of Home Affairs has also the responsibilities to coordinate the activities relating to disaster preparedness, mitigation, reconstruction and rehabilitation works with other disaster management related agencies.

In addition to the above, the Ministry carries out various types of public awareness raising programs on disaster management. A National Emergency Operation Center (NEOC) is into operation since December 2010. NEOC sends informative messages through mass media to make the people aware of the disasters. The NEOC collects and disseminates data and information.

#### 6. PREPAREDNESS STRATEGY OF THE GOVERNMENT

the Government prepared a National Action Plan on Disaster Management in 1996 which has specified priority activities to be undertaken in the field of disaster management to be implemented by the concerned agencies.<sup>6</sup> The formulation and implementation of National Strategy for Disaster Risk Management (NSDRM) in 2009 is a significant step to mainstream disaster risk reduction activities in Nepal.<sup>8</sup> With regard to disaster risk reduction, both (the Plan and Strategy) depict in matrix form the priority item groups and activities together with the responsible agencies and the cooperating agency in national hazard assessment, awareness raising, training, information system, land use planning, disaster risk reduction policy, regional, sub-regional and international cooperation among countries and establishment of documentation center.<sup>12</sup>

The following are the major strategies of the Government:

- Reduce the loss of life and property;
- Address the sufferings of the people;

- Implement land use planning;
- Develop hazard maps of the disaster prone areas;
- Make the people aware of natural disasters;
- Enhance coordination among different agencies involved in disaster management;
- Activate the non-governmental sector in rescue and relief works as well as awareness raising programs;
- Mobilize internal and external resources for rehabilitation and reconstruction;
- Carry out training at the grassroots level for the management of disasters;
- Capacity building on disaster management.

After learning lessons from the flood and landslide disaster of 1993, the Government decided to adopt the above strategies for DRR.

## 7. KEY CHALLENGES<sup>10</sup>

There are specific gaps and challenges in the field of disaster governance (organizational, legal and policy frameworks) in Nepal needing to address risk identification, damage assessment, monitoring, early warning, public awareness, preparedness, mitigation, rehabilitation and reconstruction. The government must incorporate Disaster Risk Reduction (DRR) measures into post disaster recovery and rehabilitation processes and use the opportunities for developing the capacity to reduce risk in the long-term which arise during those processes. It must work to reduce risk by sharing knowledge and lessons learned. Action in these two areas will help the government improve its legal instruments and policy frameworks. The country has gained some considerable experience in terms of risk management, vulnerability reduction and increasing preparedness and response capabilities at the community level but these experiences have not been shared, analyzed or used to update policies (Prof. Chhetri 2009). The absence of proactive disaster management legislation is the biggest impairment for an effective disaster risk reduction in Nepal.

## 8. WAY FORWARD<sup>10</sup>

In view of the above challenges, in Nepal, it is observed that though institutions have been allocated the responsibility for disaster mitigation, there are two main shortcomings in their activities: inadequate policy formulation and poor implementation. There is a need for incorporating Disaster Risk Reduction (DRR) measures into post disaster recovery and rehabilitation processes and for using the recovery phase to develop the capacity to reduce risk. Knowledge and lessons learned need to be shared across the board. At the same time, rules and regulations to back up the NCRA should be formulated. In addition, standing orders, codes, guidelines and manuals should be prepared<sup>10</sup>. It is an established fact that disasters cannot be stopped. But, the magnitude of disasters can be significantly reduced, if preventive measures be taken in proper time for which proactive policies and public awareness raising programs are highly desirable.<sup>12</sup>

## 9. DRAFT DISASTER MANAGEMENT BILL AND POLICY

In the year 2007, The Nepal Centre for Disaster Management (NCDM)<sup>1</sup> drafted a new disaster management Bill and policy. The same year NCDM submitted the draft Bill to

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<sup>1</sup> Nepal Centre for Disaster Management (NCDM) is a specialized agency in disaster management policy and education in Nepal. It is represented by high level professionals from academia, bureaucracy, media etc.

the Ministry of Home Affairs and the Policy to the National Planning Commission for further necessary action. NCDM consulted various Government and non-government agencies and individuals and organized series of meetings, workshops and interactions to finalize the Bill and the Policy.<sup>3</sup>

The Government reviewed the Bill, but the Policy is still at large. After the great pressure from the civil society – particularly from the NCDM and DPNet-Nepal, in April 2012 the Bill was forwarded to the Constituent Assembly. Unfortunately on 27 May 2012, the Constituent Assembly was dissolved. Consequently, the Bill could not be ratified. Now it is uncertain when the Constituent Assembly or Parliament will exist. At present, disaster management system in Nepal is in status quo. If the Bill would have been passed, the disaster management system in Nepal could take momentum.

## 10. CONCLUSIONS

It is not possible for a single agency to manage disasters alone; instead it requires the efforts of many agencies, a broad interdisciplinary understanding including both science and social science, and the consideration of a wide range of issues, from behavior to development, and from society to the economy. The main challenge for Nepal is the wide variety of disasters it faces. Some, like monsoon flooding recur regularly, but at various times and places. Others, like earthquakes, occur intermittently and at long intervals. In this case the lessons learned may not remain in local or institutional memory. Nepal also needs to build institutions and local capacity to minimize the impact of disasters. For any given disaster risk reduction activity to succeed, specific risks need to be targeted. Success in responses to disaster depends on factors including access to safe drinking water, reliable communication, transport and mobility, access to finances, social support, and risk minimizing strategies. Government agencies at national and local levels must coordinate the support they provide to help the affected rebuild their lives. Equally important is that agencies evaluate and learn from the success of specific interventions, especially given the complications raised by climate change. The government cannot act alone: disaster risk reduction strategies need to be developed and maintained through private and community based approaches. At this stage, for an effective disaster management system, a separate powerful agency which looks after the whole gambit of disaster management is highly necessary.

## REFERENCES

1. "1993 Flood Damage Assessment, General Infrastructure, Final Report - Main Text" (1993), GoN-UNDP, SMEC/CEMAT.
2. "Disaster Management in Nepal - A Profile (1994)", GoN, Ministry of Home Affairs, Kathmandu, Nepal.
3. "*Draft Disaster Management Bill and Policy*"- Prepared and submitted to the Government by Nepal Center for Disaster Management (NCDM) in 2007.
4. "*Environmental Strategies and Policies for Industry, Forestry and Water Resource Sectors,*" vol. 1 and 2. Government of Nepal, Ministry of Population and Environment, Kathmandu, Nepal, 1998.



5. Laban, P. (1979), "*Landslide Occurrence in Nepal. Phewa Tal Project Report no. SP/13*," Integrated Watershed Management Project, Kathmandu, Nepal.
6. "National Action Plan on Disaster Management in Nepal (1996)", GoN, Ministry of Home Affairs, Kathmandu, Nepal.
7. "Natural Calamity (Relief) Act, 1982", the Government of Nepal.
8. "National Strategy for Disaster Risk Management, 2009", the Government of Nepal.
9. Poudyal Chhetri, M.B.P. (2000), "Flood Hazards in Nepal", A Paper Presented in the First Technical Meeting on Mitigation, Management and Control of Floods in South Asia, 24-25 January 2000, New Delhi, India
10. Poudyal Chhetri, M.B. (1999), "Disaster Management in Nepal: Problems and Solutions " An Article Published in the Book on Natural Disaster Management, Edited by Jon Ingleton, Tudor Rose, Holdings Limited, Leicester, England.
11. Poudyal Chhetri, M.B. and Bhattarai, D. (2001), "Mitigation and Management of Floods in Nepal," a book published by, GoN, Ministry of Home Affairs, Kathmandu, Nepal.
12. Poudyal Chhetri, M.B. (2011), " Disaster Risk Reduction: Policy Implications for Nepal, Australia and Beyond," Post Doctorate Dissertation completed at the Queensland University of Technology, Brisbane, Australia.
13. Sharma, C.K. (1997), "Urban air quality of Kathmandu valley Kingdom of Nepal" 1997, vol. 31, no17, pp. 2877-2883 (10 ref.).
14. Soussan, J., Shrestha, B.K. and Uprety, L.P. 1995. The Social Dynamism of Deforestation: A Case Study from Nepal. The Parthenon Publishing Group Limited, London.