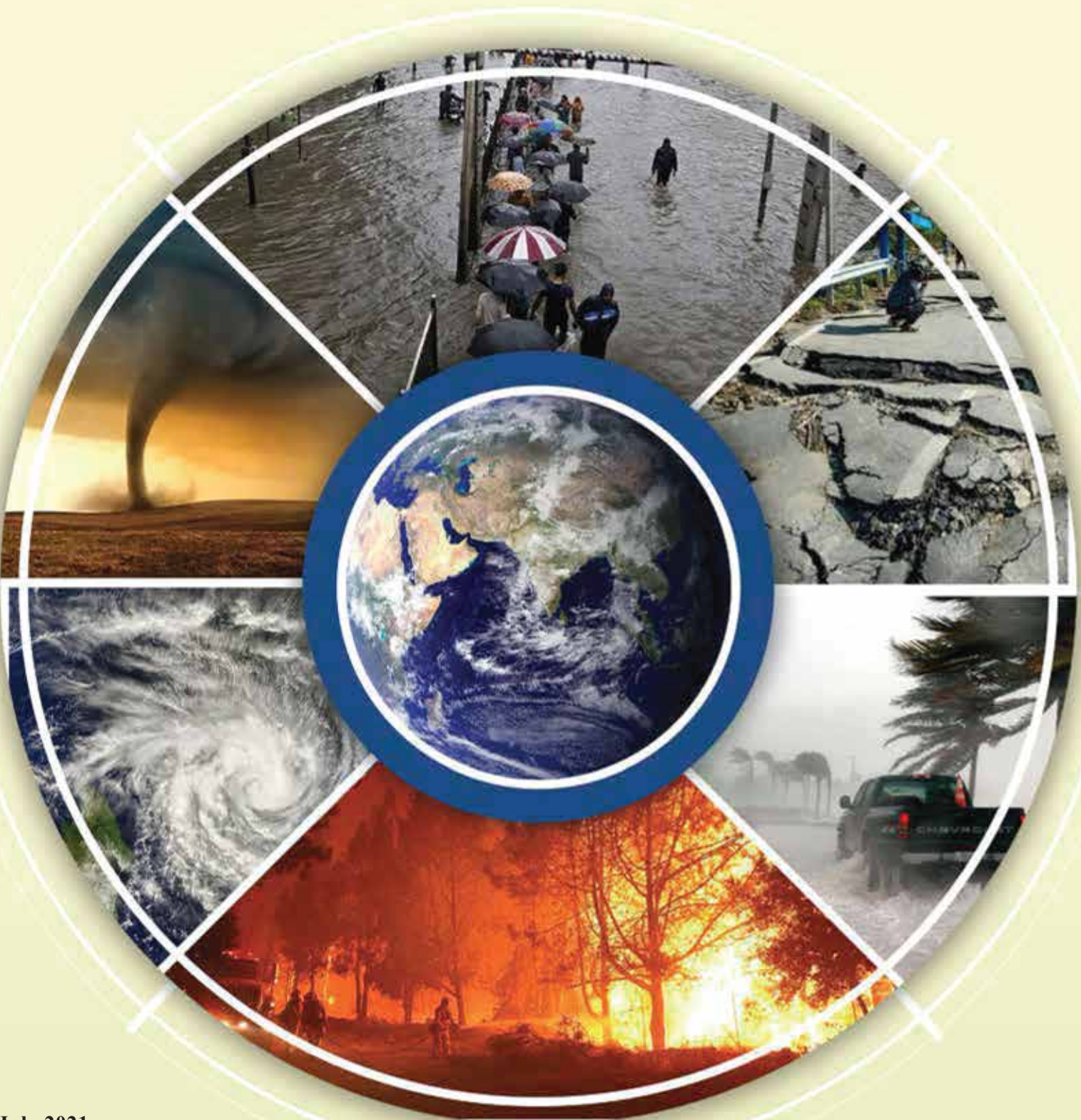




**J.B.BODA**

# **EARTH**



July 2021

## Flood Risk in Nepal

Severe flooding and flash floods have affected the country since the start of this year's monsoon rainfall.

In June 2021, torrential rains battered Nepal, causing widespread floods and damage to critical infrastructure. The excess rains had led to rivers overflowing, which resulted in widespread destruction. 26 out of 77 districts were affected.

Ambapur in Dang Deukhuri district recorded 106.6 mm of rain in 24 hours on 17th June 2021. Kanyam in Ilam district recorded 61.6 mm rain and Rikhu in Dolakha district recorded 61.4 mm rain during the same period.

The worst of the flooding struck in Helambu, Sindhupalchowk district on 15th June. Other districts affected were Palpa, Kaski, Doti, Gorkha, and Pyuthan.

In early July, heavy rain, floods, and landslides caused fatalities and destroyed homes across 15 districts. The city of Pokhara in central Nepal recorded 203.3 mm of rain, while nearby Lumle in Kaski District saw 147.5 mm.



Floods in Sindhupalchowk District, Nepal, June 2021.  
Source: Nepal Red Cross

# Floods in Nepal

Nepal is exposed to various natural disasters i.e., earthquakes, landslides, floods, thunderstorms, hailstorms, droughts, etc. Among these, floods are the most devastating in terms of the number of deaths that occur and the damages they cause.

A study by UNDP ranked Nepal as the 30th country with respect to relative vulnerability to flooding (UNDP/ BCPR, 2004). Of the total death by any type of natural disaster in 2010, 29.02% were by floods and 24.55% were by landslides, and 71.35% of the total affected families by any type of disaster in 2010 were by floods.

It is noteworthy that flood occurrence in the southern parts of Nepal is intense than in the rest of the areas. Due to low relief (difference in height between the high point and the low point on a landscape) and aggradation (increase in land elevation, typically in a river system, due to the deposition of sediment), flood events are frequent in the southern plains every year (Thapa et al. 2020). Consequently, the flood hazard zonation map indicates the southern plains as high flood hazard-prone areas. The flood occurrence in south-eastern Nepal (is depicted to be higher than that in south-central and south-western Nepal).

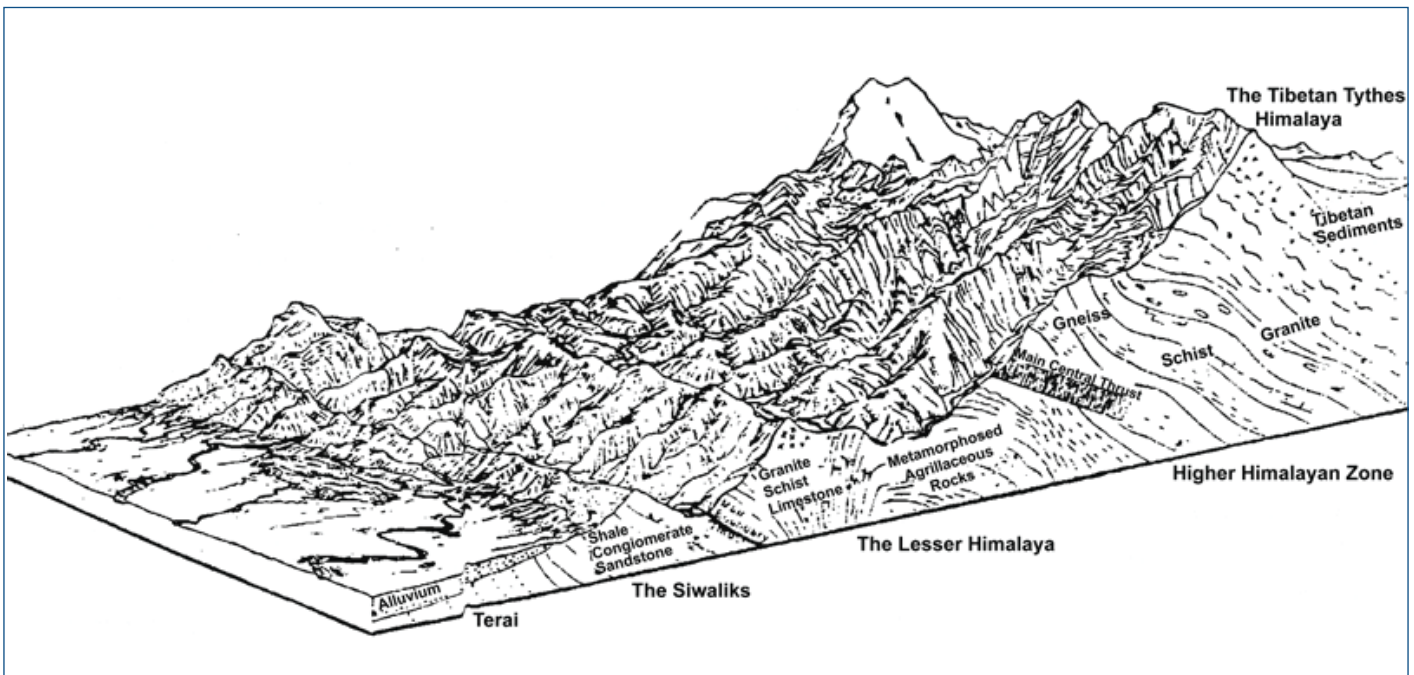


Figure 1: Geological and elevation profile of Nepal.  
Source: ICIMOD

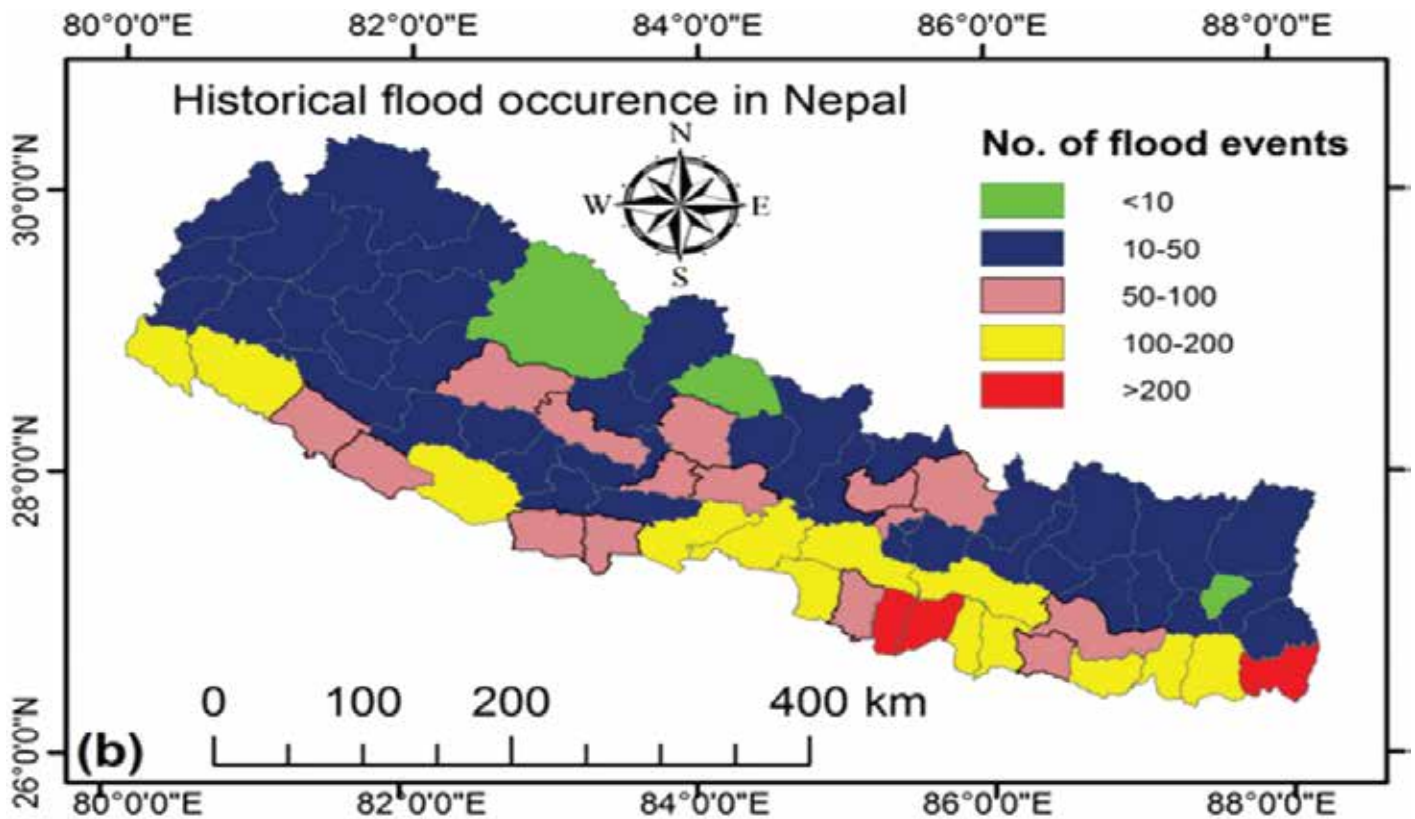


Figure 2: District-wise historical flood occurrence in Nepal. This map is prepared using the data of flood events that occurred between 1971-2018.

Source: D. Gautam et al

Please refer to Appendix 1 which shows a number of various hazard events that occurred between 1971-2018 in various districts. Kindly note that torrential rains, storms, and thunderstorms are proxies for flash floods. Also, torrential rains might cause floods in areas downstream.

### Impact of Floods

Most of the monsoonal precipitation during June and September triggers regular flooding in the low-lying Terai Plains.

For the Terai Zone, flooding is part of the annual cycle of life. Without annual floods, the forests & fauna die out, and farms along the riverbank have a negative impact. But on the other hand, abnormally large floods have had devastating effects in the Terai Zone of Nepal. Due to above-average summers, leading to an increasing trend of snow and glacial melts in the mountains, the frequency and severity of the floods have increased. In the last 40 years, there have been 12 abnormally large floods. Economic cost per major flood is calculated to be at USD 9,000 per household.

In 2017, 80% of the Terai region and some surrounding districts suffered inundation triggered by monsoonal rains, causing USD 584.7 million in damages (National Planning Commission, 2017). Other notable events include the 1993 Bagmati Flood - economic loss NPR 4.9 billion - and 2008 Flood - economic loss of around USD 3.9 million.

In July 2020, according to Nepal's National Disaster Risk Reduction Management Authority (NDRRMA), there were over 100 incidents of major flooding or landslides across the country between July 9-13. Flood risk is covered in property insurance policies. However, due to low insurance penetration, a huge protection gap exists.

For recent floods of the 2021 season, claims worth NPR 1.92 billion (USD 16.128 million) including property insurance claims of around USD 5.826 million and motor claims of around USD 400,000 were received by the insurance companies.

## References:

- Beema Samiti (Insurance Regulatory Authority of Nepal)
- Department of Hydrology and Meteorology, Nepal
- D. Gautam et al, Local-level multi-hazard zonation of Nepal, Geomatics, Natural Hazards And Risk 2021, Vol. 12, No. 1, 405-42
- Times of India
- Floodlist.com

## Appendix 1

The table below shows a number of various hazard events that occurred between 1971-2018 (Source D. Gautam et al). Kindly note that Torrential Rain, Storm, and Thunderstorm are proxies for Flash Floods. Also, Torrential Rains might cause floods in areas downstream.

Sr. No.	District	Flood	Torrential rain	Storm	Thunderstorm
1	Jhapa	288	8	4	115
2	Sarlahi	245	19	3	28
3	Rautahat	227	15	1	22
4	Sindhuli	191	0	1	52
5	Morang	189	10	1	111
6	Kanchanpur	177	6	2	31
7	Mahottari	174	5	5	26
8	Saptari	174	8	0	53
9	Kailali	169	10	10	28
10	Nawalparasi	167	10	1	24
11	Makwanpur	145	6	3	146
12	Sunsari	144	22	3	49
13	Chitwan	141	4	4	39
14	Dhanusha	135	9	4	30
15	Dang	105	2	1	55
16	Parsa	103	8	2	28
17	Bardiya	100	4	0	20
18	Rupandehi	99	19	1	13
19	Udaypur	99	4	6	73
20	Banke	92	4	11	21

<b>Sr. No.</b>	<b>District</b>	<b>Flood</b>	<b>Torrential rain</b>	<b>Storm</b>	<b>Thunderstorm</b>
21	Kaski	92	4	2	70
22	Bara	81	13	2	28
23	Siraha	75	5	3	39
24	Sindhupalchowk	66	4	3	60
25	Kathmandu	61	12	6	15
26	Syangja	61	6	0	28
27	Nuwakot	55	7	0	72
28	Kapilbastu	54	6	0	12
29	Rukum	54	7	0	28
30	Baglung	52	7	1	51
31	Tanahun	52	5	4	40
32	Kavre	50	13	5	46
33	Lalitpur	50	13	1	17
34	Dhading	47	25	1	56
35	Bajura	45	3	1	16
36	Dailekh	44	11	0	31
37	Bajhang	42	13	0	8
38	Dadeldhura	40	3	2	8
39	Ilam	39	1	1	57
40	Khotang	37	12	1	49
41	Sankhuwasabha	33	8	1	56
42	Dolakha	32	10	0	49
43	Myagdi	32	7	4	24
44	Gorkha	31	2	2	25
45	Lamjung	30	4	1	34
46	Palpa	28	8	0	25
47	Surkhet	28	3	1	17
48	Gulmi	27	1	0	49
49	Solukhumbu	27	1	2	56
50	Baitadi	26	3	0	16
51	Jajarkot	25	5	0	27
52	Parbat	25	9	0	38
53	Salyan	25	9	0	13
54	Bhaktapur	24	14	1	7

Sr. No.	District	Flood	Torrential rain	Storm	Thunderstorm
55	Humla	24	2	1	1
56	Taplejung	24	6	0	46
57	Darchula	23	0	2	7
58	Doti	23	5	0	16
59	Achham	22	18	0	20
60	Okhaldhunga	22	6	1	55
61	Arghakhachi	21	4	2	12
62	Mustang	21	2	2	0
63	Pyuthan	21	6	0	24
64	Bhojpur	20	6	1	35
65	Ramechhap	20	14	2	36
66	Rasuwa	17	1	0	16
67	Dhankuta	15	2	6	34
68	Jumla	15	1	0	17
69	Panchthar	15	0	1	17
70	Rolpa	14	1	0	27
71	Kalikot	13	3	0	5
72	Mugu	13	3	0	5
73	Dolpa	7	8	0	3
74	Manang	7	2	1	0
75	Tehrathum	5	8	0	20

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