

PREFACE

INTRODUCTION TO JULY 1993 DISASTER

Nepal is a small mountainous country susceptible to floods, debris flows, landslides, earthquake etc. Without the time lapse for memory of 1988 earthquake, floods and landslides of the July 1993 added new problem to the nation. The floods of unprecedented magnitude along with big landslides and debris flows were experienced in Central and Eastern Nepal due to incessant rainfall for 3 days during the third week of July 1993. As a result of these floods and landslides, heavy losses of infrastructures, lives and properties were experienced. Districts in Terai and inner Terai plains were inundated and roads joining Terai to Kathmandu Valley were blocked nearly for a month creating unrest to inhabitants of Kathmandu Valley.

Normally the monsoon occurs in Nepal from around May to September each year playing major role in Nepal's agro-based economy. But this year nature turned to be cruel during this period. Weather patterns over the globe in mid July 1993 shows a low pressure zone over regions of East Africa, South Asia and West Pacific. The low pressure centered over mid-Nepal at the same time caused expensive and sudden climatic imbalance resulting in heavy and incessant rainfall for three days from 19th to 21st of July 1993. The maximum rainfall recorded was 540 mm a day with night-time rainfall at the rate of 65 mm per hour at Tistung station of Makwanpur District. The river discharge was greatest in many rivers of Nepal, even greater than the design discharge of major infrastructures such as barrages, hydro-power plants, bridges, roads and river training works.

1. **PRITHIVI HIGHWAY** (Page 14 - 31)

The Prithivi highway which connects Kathmandu to Terai was severely damaged in many places causing traffic blockade for about a month. Some sections were covered by landslides and most part of the highway was covered with floodwater of Trisuli River causing difficulty for damage assessment of affected areas. Three major bridges of Agra River (Mahadevbesi), Belkhu River and Malekhu River were destroyed by debris flows. One span (22 m) of two span bridge of Malekhu, three spans (66 m) of three span bridge of Belkhu, and three spans (66 m) of four span bridge of Mahadevbesi were washed out. Severe road damages and failures of retaining structures occurred at 60 places. Jogimara landslide caused traffic blockade for about one week.

2. **TRIBHUVAN HIGHWAY** (Page 32 - 38)

Tribhuvan Highway connecting Kathmandu Valley to Raxaul running mostly through the ridge also suffered severe damage. Three bridges (10 m, 61 m and 7 m span), 23 culverts and 534 m of road section at 19 places were completely washed out. Retaining structures failed at more than 103 meters. Around Palung and Aghor the highway was lost for

several hundred meters length. At Khanigau a big debris flow caused destruction about 100 m length of road which needed about one week to repair. This highway was closed for more than one month.

3. KULEKHANI HYDROELECTRIC PROJECT (Page 39 - 44)

The major hydro-power plant of Kulekhani I and Kulekhani II suffered severe damages. Debris flows caused by the incessant rain brought thousands of tons of boulders down the mountain stream and broke away the penstock pipe at Jurikhet Khola causing stoppage of Kulekhani I system. The intake of Kulekhani II at Mandu Khola was also damaged by the debris flows. A boulder as big as 4000 tons of weight (about 20 m x 10 m x 8 m) flowed down the Mandu Khola to near the Mandu intake.

This happened at a time when the people were having to bear power shedding owing to only 203 megawatts of power being produced against the present demand of 250 Megawatts. The damage to the Kulekhani hydropower system meant a short fall of 40% in the national power system.

4. MAKWANPUR DISTRICT (Page 45 - 55)

The rainfall of July 19 to 21 was concentrated at Kulekhani watershed, which lies at the mountain area of Makwanpur District. Landslides and debris flows were major disastrous events. In many tributaries flood was compounded by landslides. In this district alone 242 persons died and 14,748 families were affected. Over 3600 houses were partly or completely damaged and about 4,656 hectares of cultivated land was destroyed.

Phedigau of Palung VDC was perhaps one of the most affected in the District. Before the disaster Phedi Village was surrounded by two small mountain streams. Debris flows from these two streams joined upstream the village and hit the village directly. Peaceful village which was rich for vegetable cultivation turned into a sea of debris. 64 people were killed in this village alone. One steep stream called "Kitini" accumulated a huge amount of boulder debris destroying 9 houses at Thanabazar of Palung VDC. The bridge of Tribhuvan Highway was just saved from the debris. Agra VDC suffered many landslides at Chitsapani, Chaubas and Chaap killing 39 people. The landslides compounded debris flows at Agra River caused failure of Mahadevbsi bridge of Prithivi Highway.

5. BAGMATI RIVER (Page 56 - 71)

The most affected areas were the downstream areas of Bagmati river. Due to the damage of eastern and western canals and flooding over the Bagmati river caused the human loss of 789 persons and affected 30,200 families. Many villages located in the islands of the river or by the river bank were totally damaged. The most affected was Sankarapura village in Sarlahi on the eastern side of the river, where as many as 223 persons lost their lives and a few ruins of houses remain without dwellers even a few months after the disaster.

People living at both bank of the river were not aware of the impending danger when the flood hit their villages because the heavy rainfall was only at upstream of the rivers and the rains were less in the downstream areas. A peaceful night turned into nightmare all of a sudden. Some were swept away with their houses without noticing the danger and some were swept away while attempting to save themselves from the midnight floods. Many clung to their cattle and trees but not to avail. Many died attempting to save their family members. To the north of the Indian border, Gaur Municipality with population of more than twenty thousand was submerged under flood water for weeks with water depth of more than two meters.

6. EAST RAPTI RIVER (Page 72 - 77)

In the East Rapti River, the bank was breached in Chitawan District and the rapid flowing water ran over several villages. 5300 families were affected including 22 dead. Over 2800 houses were totally or partly damaged. 1522 hectares of irrigation land was buried under the sand.

7. SINDHULI DISTRICT (Page 78 - 81)

Sindhuli district also suffered from floods, landslides and debris flows at the same time. The Marin Khola breached its banks in many areas before joining to Bagmati River upstream of Bagmati Barrage. The road joining to district headquarter was blocked for about one and half month due to the flood.

8. OTHER DISTRICTS (Page 82 - 83)

Dhading and Kabhrepalanchok Districts were similarly affected by floods and landslide. Those disaster claimed 94 lives affecting 15,152 families with 4,475 houses completely or partially destroyed. Standing crops of over 6100 hectares were wiped out. 40 districts out of a total 75 districts were affected.

9. KATHMANDU VALLEY (Page 84)

Besides the direct damages to the people of affected areas, the people in Kathmandu had to endure hardships. As a result of the damages to Prithivi and Tribhuvan Highway, the capital remained virtually cut-off from its vital supply routes for over a month. Rising prices and scarcity had become deep concern among the people of Kathmandu. People had to stand in long ques for hours for items of daily necessity. Sugar, kerosene, diesel, petrol and cooking gas were all in short supply.

10. RELIEF OPERATION (Page 85 - 90)

In order to help the people in affected areas Army, police, government agencies, NGOs and local people took prompt action for relief. These efforts were coordinated by the Disaster Relief Coordination Committee under the chairmanship of Honourable Home Minister. In view of the magnitude of the disaster and seriousness of the situation, UN and international organizations, friendly nations and INGOs promptly responded to the appeal made by the government providing assistance in cash, equipments, goods etc. and sent teams for relief operations and medical treatment. The civil servants professionals offered donation to the fund raised for disaster relief.

The logistic service unit was organized in Tribhuvan International Airport at Kathmandu and Regional Service Centre at Simara Airport. Over 31,000 people took refuge in different camps. Different regional and village level relief camps were set up at 65 places for provision of emergency relief supplies such as food, medicines and clothes.

Barely three weeks after the heavy rain another water-induced tragedy occurred on 8th and 9th August. The districts of Panchthar and Taplejung in North-East Nepal along with Sindhuli, Dhanusha, Mohottari, Sarlahi, Rautahat and Bara District of Central Nepal were hard hit. At that time 50 people were killed, 1,956 families were affected and 181 houses were completely or partially damaged.

The magnitude of the disaster was enormous. The disaster has so far claimed 1259 human lives. 201 Persons are still unaccounted for. In all, 73,606 families have been affected with 39,043 houses fully or partially damaged. About 43,330 hectares of fertile land have been washed away by floods or covered with landslides. The damage to infrastructures has been heavy. About 367 kilometers of road have been damaged. 213 permanent, wooden and suspension bridges have been washed away. 38 large to small irrigation projects and thousands of farmer managed irrigation schemes have also been destroyed. 452 school blocks, hospitals and government buildings have been damaged. The interruption on the regular supply of electricity affected every industry, factory and mill decreasing the production.

In view of these enormous damage of unprecedented magnitude, people in the affected areas will have to suffer difficulties for years to come until they will be able to resume their normal life. More serious is the adverse effect of the disaster on the social and economic development of the country which has been achieved in the past decades with national efforts assisted by a number of donors in the world.

DATE : 09/16/93

S NO.	DISTRICT	AFFECTED		PERSON			HOUSES DAMAGED		LAND LOSS AREA IN HECTARE
		HH	POP	DEATH	MISSING	INJURED	COMPLETE	PARTLY	
1.	ARGHAKHANCHI	0	0	2	0	1	0	0	0
2	BAGLUNG	12	0	1	0	0	20	5	19
3	BANKE	0	1400	1	0	0	73	39	0
4	BARA	557	0	2	0	0	63	41	40
5.	CHITWAN	5293	34943	22	13	71	2200	613	1522
6.	DHADING	1113	23628	24	0	16	525	394	1075
7	DHANUSHA	3225	22048	0	0	0	482	1567	34
8	DOLAKHA	0	0	0	0	0	0	30	1
9	DOTI	0	0	9	1	0	0	0	0
10	GORAKHA	28	0	0	0	0	21	0	12
11	GULMI	3	0	0	0	0	3	0	0
12	JHAPA	0	0	0	0	0	18	1	1
13	KAILALI	0	0	2	0	0	0	0	106
14	KALIKOT	0	0	0	0	0	1	0	0
15	KASKI	0	0	1	0	0	0	0	0
16	KATHMANDU	10	0	2	0	3	8	0	3
17	KAVRE	2958	10642	20	0	3	914	92	1030
18.	KHOTANG	0	0	1	3	5	30	0	0
19.	LALITPUR	0	0	6	0	7	57	51	135
20.	LAMJUNG	0	0	0	0	0	1	5	0
21.	MAHOTTARI	13	0	8	2	3	0	0	0
22.	MAKKANPUR	14748	101482	242	7	39	1732	1879	4656
23.	MORANG	0	0	0	0	0	0	0	5
24	MUSTANG	0	0	0	2	0	0	0	0
25	NAWALPARASI	0	22800	0	0	0	300	500	0
26	OKHIALDHUNGA	76	0	0	0	0	250	315	550
27	PALPA	0	0	9	0	0	1	8	0
28	PANCHTAR	1115	5575	22	0	0	13	93	176
29	PARSA	826	0	2	0	0	53	78	356
30	PYUTHAN	41	0	0	0	0	0	0	0
31	RAMECHHAP	0	0	3	0	5	299	345	498
32	RAUTAHAT	14644	89146	111	115	33	2003	4541	1366
33	RUPANDEHI	0	0	1	0	0	286	0	0
34	SALYAN	0	0	4	0	0	1	0	0
35	SAPTARI	0	8109	0	0	0	48	0	0
36.	SARLAHI	15560	83265	687	56	0	7066	8494	25966
37.	SINDHULI	11051	59142	52	0	23	1206	1314	4061
38.	SINDHUPALCHOK	59	374	0	0	0	3	13	14
39	SIRAHA	1145	28806	0	0	0	523	292	1421
40	SOLKHUMBU	0	0	0	0	0	0	0	0
41	TANAHU	0	0	2	0	0	3	0	5
42	TAPLEJUNG	811	3184	28	0	10	74	1	110
43	TERHHUM	0	0	2	2	0	45	0	53
44.	UDAYPUR	318	1590	1	0	0	0	0	115
	GRAND TOTAL	73606	496334	1259	201	219	18322	20711	43330

* THE KATHMANDU POST NEWS DATA 09/24/93

CROP LOSS		LIVESTOCK LOSS IN NOS	DAMAGE TO INFRASTRUCTURE					FOOD GRAIN LOSS		TOTAL WORTH IN NRS
AREA	UNIT		ROADS IN KM	BRIDGE IN NOS.	DAMS IN NOS.	FMIS IN NOS	PUBL BLDG IN NOS	QTY	UNIT	
0.00		2	0.00	0	0	0	0	0.00		669500.00
0.00		0	0.00	0	0	10	6	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
549.00	BIGHA	0	6.00	0	0	0	0	0.00		21592062.90
0.00		1012	0.60	2	2	0	0	0.00		0.00
2917.00	HECT	301	1.29	16	0	1	38	2917.00	TON	17310000.00
0.00		18	10.00	5	9	74	5	10000	TON	159615100.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		22	0.00	0+1	0	0	0	0.00		0.00
38.00	HECT	0	0.00	9	0	0	1	0.00		2394000.00
0.00		5	0.00	0	0	0	0	0.00		120500.00
2.60	HECT	0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.000		0	0.00	1	0	0	0	0.00		0.00
0.00		159	0.00	0	0	0	0	0.00		86274750.00
0.00		100	0.00	0	0	4	14	0.00		13932086.00
0.00		0	0.00	2	0	0	0	0.00		0.00
512.00	MURI	0	0.00	1	0	1	0	0.00		0.00
0.00		0	0.00	12	0	0	0	0.00		0.00
85460.00	MURI	665	7.92	16	1	251	118	0.00		119864381.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
491.00	MURI	104	0.00	1	0	0	2	4956.00	TON	105385653.00
0.00		9	0.00	0	0	1	1	0.00		150000.00
4585974.00	RS	23	0.00	0	0	0	0	0.00		18717191.00
1300.00	HECT	104	4.88	5	0	1	5	36.00	TON	155916000.00
0.00		0	0.00	0	0	8	0	0.00		556300.00
0.00		128	4.00	4	0	51	21	261.00	TON	0.00
7821.00	HECT	3211	40.00	13	0	1	37	31673.00	QTL	899680261.00
0.00		0	0.00	0	0	0	0	0.00		0.00
0.00		0	0.00	0	0	0	0	0.00		53480.00
0.00		0	0.00	0	0	0	0	0.00		0.00
25966.00	HECT	17736	266.00	81	4	117	184	0.00		1118918500.00
5145.00	BIGHA	1930	26.00	41	5	6	24	1186.00	TON	86349764.00
0.00		0	0.00	0	0	0	0	0.00		0.00
1227.00	BIGHA	20	0.00	0	2	0	2	87.00	BIGHA	38300657.00
132000.00	RS	0	0.00	2	0	0	0	0.00		0.00
0.00		0	0.20	1	11	0	0	0.00		0.00
0.00		3	0.00	0	0	46	0	0.00		17756395.00
2238960.00	RS	54	0.00	1	0	48	0	5.67	TON	0.00
0.00		0	0.00	0	0	0	0	0.00		0.00
		25606	366.89	213	34	620	452	41221.67	TON	4719488485.90

HH - Household POP - Population
FMIS - Farmer Managed Irrigation Scheme
0.0 means non-availability of data



