APPENDIX 5 SOIL ANALYSIS RESULTS

KASKI NORTH MODEL AREA

Pit No.	SOIL TYPE	Horizon	Depth	Color	Mottling	pH H2O	pH KCl	Exchangeable cation(me/100g) Na	K	Mg	Ca	TEB	CEC (me/100g)	B-S (%)	Total N (%)	Orga-C (%)	C/N	P-BRAY ppm	TEX-SAND 2~0.05mm	TEX-SILT 0.05~0.002	TEX-CLAY <0.002mm	TEXTURE CLASS
1	(Ks)	A1	0-10	10YR3/2		5.40	4.07	0.10	0.21	0.99	2.60	3.93	11.81	33.28	0.34	4.18	12.29	0	46	24	30	SANDY CLAY LOAM
		B	10-63	10YR3/4		5.48	4.12	0.10	0.09	0.33	0.55	1.07	5.03	21.27	0.10	0.94	9.40	29	40	40	20	LOAM
		C	63-80	10YR3/4		5.21	4.15	0.05	0.06	0.25	0.50	0.88	2.37	37.13	0.07	0.83	11.86	56	48	36	16	LOAM
2	Cmd	A	0-23	7.5YR4/4		5.34	4.12	0.05	0.08	0.25	0.70	1.08	6.45	24.27	0.09	0.92	10.22	1	60	24	16	SANDY LOAM
		B1	23-69	10YR4/6		5.32	4.08	0.05	0.04	0.25	0.40	0.78	5.61	13.90	0.05	0.45	9.00	1	60	22	18	SANDY LOAM
		B2	69-85	10YR6/6		5.29	4.07	0.05	0.03	0.16	0.30	0.54	4.20	12.86	0.03	0.25	8.33	1	68	28	12	SANDY LOAM
3	Cmd	A1	0-20	7.5YR3/4		5.09	3.93	0.05	0.13	0.16	0.65	0.80	11.03	8.07	0.30	3.64	12.13	1	38	42	20	LOAM
		A2	20-35	7.5YR3/3		5.07	4.01	0.05	0.09	0.08	0.55	0.77	11.61	6.63	0.20	2.99	11.50	2	46	38	16	LOAM
		C	>35	5YR3/3		4.92	3.98	0.05	0.07	0.04	0.40	0.56	9.85	5.69	0.20	2.63	13.15	4	42	40	18	LOAM
4	Fle	AP	0-20	5Y5/3	10YR5/6	6.46	6.24	0.05	0.04	0.90	1.80	2.79	0.55	507.30	0.04	0.48	12.00	10	62	32	6	SANDY LOAM
		B1	20-30	2.5Y5/3	10YR5/6	6.57	6.75	0.05	0.04	1.40	2.00	3.49	0.18	1939.00	0.02	0.26	13.00	11	68	28	4	SANDY LOAM
		B2	30-60	2.5Y5/6	10YR5/6	6.54	6.15	0.05	0.08	0.74	3.05	3.92	1.64	239.00	0.03	0.46	15.33	11	32	64	4	SILT LOAM
		C	>60	2.5Y5/2		6.46	6.93	0.05	0.03	1.81	3.25	5.14	0.18	2850.00	0.02	0.33	16.50	3	74	22	4	SANDY LOAM/LOAMY SAND
5	Cmd	A1	0-8	7.5YR2/2		5.13	3.97	0.10	0.36	0.41	0.60	1.27	7.66	16.58	0.24	3.64	15.17	5	48	38	14	LOAM
		A2	8-13	7.5YR3/3		5.06	3.91	0.05	0.27	0.33	0.20	0.85	8.76	9.70	0.22	3.25	14.77	4	50	36	14	LOAM
		B1	13-25	7.5YR4/4		5.24	4.15	0.05	0.37	0.16	0.05	0.63	8.91	7.07	0.18	3.06	17.00	3	49	41	10	LOAM
		B2	25-60	7.5YR4/4		5.23	4.22	0.05	0.20	0.08	0.05	0.38	8.25	6.08	0.14	2.40	17.14	3	46	46	8	LOAM
		C	>60	10YR5/6		5.42	4.20	0.05	0.10	0.04	0.10	0.29	2.84	10.21	0.06	1.05	17.50	1	44	44	12	LOAM
6	HGd	A	0-30	10YR4/2		5.18	3.99	0.05	0.10	0.08	0.65	0.88	9.67	9.10	0.24	3.78	15.75	1	31	51	18	SILT LOAM
		C	50-80	7.5YR3/4		5.06	3.96	0.01	0.13	0.16	0.90	1.20	9.83	12.21	0.28	3.97	14.18	1	34	46	20	LOAM
7	CMd	A	0-10	7.5YR4/3-4		4.64	3.93	0.10	0.21	0.25	0.30	0.86	6.19	13.89	0.23	3.39	14.74	2	36	44	20	LOAM
		B	10-20	10YR5/6		5.02	4.14	0.05	0.04	0.04	0.10	0.23	2.72	8.39	0.11	1.39	12.64	1	32	54	14	SILT LOAM
		C	20-80	10YR7/4		5.32	4.16	0.05	0.01	0.04	0.05	0.15	2.19	6.85	0.03	0.36	12.00	1	26	64	10	SILT LOAM
8	CMd	A	0-10	10YR3/2		5.75	4.57	0.20	0.79	2.06	3.90	6.95	14.12	49.22	0.34	4.66	15.71	8	58	16	16	SANDY LOAM
		B	10-40	10YR3/2		5.53	4.28	0.10	0.35	0.58	2.00	3.03	8.04	37.69	0.22	2.55	11.59	2	42	44	14	LOAM
9	CMd	A	0-15	7.5YR3/4		5.77	4.68	0.05	0.12	0.99	2.60	3.76	7.74	48.58	0.29	3.31	11.41	5	44	46	10	LOAM
		B	15-60	10YR3/4		5.89	4.85	0.05	0.15	0.66	0.28	1.14	6.75	16.89	0.24	2.58	10.75	12	46	42	12	LOAM
10	CMd	Ap	0-10	10YR3-4/3		5.36	3.94	0.05	0.08	0.16	1.10	1.39	9.10	15.27	0.26	3.19	12.27	28	44	41	15	LOAM
		AB	10-45	10YR3/4		5.14	4.26	0.00	0.03	0.04	0.75	0.82	6.93	11.83	0.19	2.32	12.21	4	42	46	12	LOAM
		BC	>45	10YR3/4		5.27	4.34	0.05	0.07	0.16	1.20	1.48	4.56	32.46	0.22	3.20	14.55	0	40	50	10	SILT LOAM/LOAM
11	HGd	Ap1	0-16	10YR3/4		5.23	3.85	0.05	0.06	0.08	0.30	0.49	7.36	6.66	0.20	3.09	15.45	8	40	42	18	LOAM
		A2	16-42	10YR3/3		4.72	4.06	0.05	0.03	0.04	0.15	0.27	8.76	3.08	0.17	2.93	17.24	17	44	42	14	LOAM
		AC	>42	7.5YR2/3		5.28	4.02	0.05	0.03	0.04	0.15	0.27	9.07	2.79	0.18	3.73	20.72	22	30	58	12	SILT LOAM
12	CMh	A	0-20	5YR3-4/4		4.81	2.87	0.05	0.13	0.08	0.15	0.41	16.62	2.47	0.39	4.47	11.46	0	34	45	21	LOAM
		B	20-50	10YR4/6		5.01	4.31	0.05	0.07	0.04	0.20	0.36	11.02	3.10	0.29	3.16	10.90	0	36	40	24	LOAM
		C	>50	7.5YR5/6		5.40	4.04	0.05	0.08	0.08	0.30	0.51	5.87	8.69	0.11	1.02	9.27	0	12	46	42	SILTY CLAY
13	CMh	A	0-20	7.5YR2/2		5.37	4.12	0.25	1.08	1.48	1.70	4.51	28.03	16.09	0.90	12.02	13.36	1	62	26	12	SANDY LOAM
		B	20-30	7.5YR4/4		5.64	4.41	0.15	0.77	0.41	1.70	3.03	10.90	27.80	0.23	2.89	12.57	10	66	20	14	SANDY LOAM
		C	>30	10YR5/4		5.81	4.46	0.05	0.07	0.08	0.20	0.40	5.72	6.99	0.04	0.58	14.50	35	72	20	8	SANDY LOAM
14	CMd	A	0-13	10YR3/4		5.29	4.15	0.05	0.10	0.08	0.40	0.63	4.26	14.79	0.13	1.65	12.69	1	34	54	12	SILT LOAM
		B1	13-34	7.5YR3/4		5.73	4.42	0.05	0.02	0.04	0.30	0.41	5.47	7.50	0.08	1.52	19.00	0	36	53	11	SILT LOAM
		B2	34-70	7.5YR3/4		5.59	4.35	0.05	0.02	0.04	0.30	0.41	5.47	7.50	0.10	1.98	19.80	0	34	58	8	SILT LOAM
15	CMd	A	0-20	7.5YR3/3		5.08	3.81	0.05	0.21	0.49	0.60	1.35	12.00	11.25	0.34	4.21	12.38	14	48	38	14	LOAM
		C(B)	20-65	7.5YR3/2		4.98	4.08	0.05	0.08	0.08	0.30	0.51	12.22	4.17	0.32	4.24	13.25	20	50	43	7	SANDY LOAM/LOAM
16	CMc	AP	0-20	2.5Y5/3		5.82	4.04	0.05	0.07	0.16	2.25	2.53	4.84	52.27	0.19	2.24	11.79	20	28	60	12	SILT LOAM
		B	20-50	10YR3/4		5.89	4.87	0.05	0.06	0.16	1.80	2.07	4.56	45.39	0.10	1.60	16.00	24	26	64	10	SILT LOAM
		BC	50-80	2.5Y5/6		5.82	4.82	0.00	0.03	0.04	0.50	0.57	1.82	31.32	0.04	0.38	9.50	8	30	64	6	SILT LOAM
17	Rcc	A	0-10	2.5YR3/3		5.70	4.65	0.05	0.20	1.23	4.10	5.58	8.52	67.07	0.30	5.25	10.83	2	52	38	10	SANDY LOAM/LOAM
		C	10-65	7.5YR4/4		5.68	4.84	0.05	0.03	0.41	1.15	1.64	2.01	81.59	0.07	0.96	13.71	1	72	24	4	SANDY LOAM
18	CMc	Ap	0-20	2.5YR3/2	.5YR5/8 15	6.01	4.86	0.05	0.12	1.40	3.25	4.82	5.42	88.93	0.16	1.97	12.31	24	38	50	12	SILT LOAM/LOAM
		B	20-25	7.5YR4/4	.5YR5/8 60	6.25	5.57	0.05	0.06	1.48	3.55	5.14	4.20	122.40	0.07	1.05	15.00	8	36	56	8	SILT LOAM
		C	25-60	10YR4/2-3	0YR3/4 25%	6.18	5.54	0.05	0.06	1.40	0.65	2.16	4.20	51.43	0.07	1.03	14.71	21	32	60	8	SILT LOAM
19	CMd	A1	0-14	2.5YR3/2		4.69	3.98	0.05	0.10	0.25	0.40	0.80	10.45	7.66	0.23	2.95	12.83	1	30	46	24	LOAM
		A2	14-35	7.5YR2/2		4.93	4.08	0.05	0.04	0.08	0.35	0.52	6.93	7.50	0.20	2.87	14.35	0	36	44	20	LOAM
		B	35-65	7.5YR3/2		5.06	4.11	0.05	0.04	0.04	0.20	0.33	8.29	3.93	0.20	3.00	15.00	0	32	57	11	SILT LOAM
		C	>65	7.5YR4/3		5.22	4.08	0.05	0.05	0.08	0.15	0.33	7.01	4.71	0.16	2.26	14.13	0	34	52	14	SILT LOAM
20	FLc	AP	0-25	2.5YR5/1		0.10	5.17	0.05	0.08	1.23	3.90	4.96	2.00	171.00	0.14	1.67	11.93	4	30	57	13	SILT LOAM
		AB	25-80	2.5Y5/6	5YR5/4	5.87	5.08	0.05	0.04	1.48	4.90	6.47	3.47	177.80	0.08	0.95	11.88	3	42	48	10	LOAM
		C	>80	2.5Y4/2		6.42	5.45	0.05	0.07	1.40	5.75	7.27	3.47	209.50	0.06	1.01	16.83	3	60	38	2	SANDY LOAM

KASKI EAST MODEL AREA

Pit No.	SOIL TYPE	Horizon	Depth	Color	Mottling	pH H2O	pH KCl	Exchangeable cation(m.e/100g) Na	K	Mg	Ca	TEB	CEC me/100g	B-S (%)	Total N (%)	Org-C (%)	C/N	P_BRAY ppm	TEX_SAND 2~0.05mm	TEX_SILT 0.05~0.002	TEX_CLAY <0.002mm	TEXTURE CLASS
1	Cld	A	0-20	10YR4/6		5.06	3.69	0.05	0.04	0.08	0.20	0.37		6.83								
		B1	20-43	10YR4/6		4.78	3.83	0.00	0.04	0.04	0.10	0.18	3.83	4.70	0.10	1.20	12.00	0.00	28	44	28	CLAY LOAM
		B2	43-103	7.5YR5/8		5.16	3.70	0.05	0.03	0.08	0.35	0.51	6.02	8.47	0.06	0.53	8.83	0.00	20	46	34	CLAY LOAM/SILTY CLAY LOAM
2	Cld	A	0-10	7.5YR3/3		4.80	3.70	0.10	0.33	0.41	0.25	1.09	11.61	9.39	0.32	4.97	15.53	1.24	26	48	26	CLAY/CLAY LOAM
		B	10-45	7.5YR4/6		4.95	3.92	0.05	0.07	0.04	0.10	0.26	6.57	3.96	0.14	1.77	12.64	0.00	22	50	28	CLAY LOAM
		C	45-65	7.5YR 5/6		5.44	3.93	0.05	0.05	0.04	0.05	0.19	4.38	4.34	0.07	0.79	11.29	0.34	26	51	23	SILT LOAM
3	Cld	A	0-12	7.5YR4/6		4.98	4.01	0.10	0.39	0.41	0.30	1.20	6.58	18.24	0.20	2.73	13.65	1.24	32	44	24	LOAM
		B	12-45	5YR5/6		5.05	4.15	0.05	0.22	0.08	0.15	0.50	4.56	10.96	0.14	2.11	15.07	0.34	26	48	26	LOAM
		C	45-82	7.5YR6/8		5.42	4.11	0.05	0.06	0.04	0.15	0.30	3.47	8.65	0.05	0.62	12.40	0.34	32	44	24	LOAM
4	FLd	Ap	0-17	10YR4/3	5YR4/8 15%	5.43	4.20	0.05	0.04	0.41	0.90	1.40	4.29	32.63	0.11	1.24	11.27	0.36	20	64	16	SILT LOAM
		B	17-62	10YR4/4	5YR4/8 70%	5.48	4.34	0.05	0.03	0.58	1.00	1.66	3.40	48.82	0.04	0.68	17.00	4.54	40	48	12	LOAM
5	Alh	Ap	0-16	10YR5/4	5YR5/8	5.88	4.78	0.05	0.10	1.23	1.95	3.33	4.93	67.55	0.08	1.01	12.63	1.42	32	48	20	LOAM
		B1	16-65	10YR4/6	10R5/8	6.38	5.09	0.10	0.21	1.97	3.90	6.18	8.76	70.55	0.07	1.04	14.86	5.25	34	38	28	CLAY LOAM
		B2	>65	7.5YR4/6	10YR5/8	6.33	4.13	0.10	0.24	1.81	4.00	6.15	8.94	68.79	0.08	1.03	12.88	4.27	30	38	32	CLAY LOAM
6	ACh	A	0-16	5YR3/4		5.47	4.24	0.10	0.47	1.32	1.20	3.09	11.26	27.44	0.25	3.73	14.92	0.91	34	46	20	LOAM
		B1	16-55	10YR4/6		5.18	4.17	0.10	0.32	0.49	0.30	1.21	7.51	16.11	0.12	1.58	13.17	0.34	26	48	26	LOAM
		B2(t)	>55	2.5YR4/8		5.34	4.09	0.05	0.23	0.33	0.50	1.11	5.18	21.43	0.05	0.64	12.80	0.23	18	44	38	SILTY CLAY LOAM
7	SAND	A	0-13	10YR5/3		6.57	6.23	0.05	0.06	0.82	3.35	4.28	1.97	217.30	0.04	0.58	14.50	2.95	90	3	7	SAND
		C	13-65	10YR5/4		6.70	7.43	0.05	0.06	0.33	9.75	10.19	0.54	1887.00	0.01	0.24	24.00	1.42	84	12	4	LOAMY SAND
8	Cld	A	0-10	5YR5/6		5.21	4.09	0.05	0.06	0.00	0.10	0.21	6.79	3.09	0.10	1.22	12.20	0.23	24	42	34	CLAY LOAM
		BC	10-28	5YR4/6		5.43	4.18	0.05	0.00	0.00	0.40	0.45	6.79	6.63	0.20	2.84	14.20	3.07	50	20	24	SANDY CLAY LOAM
9	ACh	A	0-13	2.5YR4/6		5.08	4.04	0.10	0.34	0.41	0.70	1.55	9.47	16.37	0.18	2.51	13.94	0.34	22	40	38	CLAY LOAM
		B1	13-40	2.5YR5/8		5.07	3.97	0.05	0.07	0.00	0.10	0.22	7.86	2.80	0.07	0.85	12.14	0.11	20	36	44	CLAY
		B2(t)	>40	2.5YR5/8		5.22	3.95	0.05	0.06	0.00	0.20	0.31	7.69	4.03	0.06	0.81	13.50	0.11	20	38	42	CLAY
10	Cld	A	0-10	10YR4/6		5.16	4.21	0.05	0.33	1.48	2.60	4.46	14.02	31.81	0.39	5.99	15.36	0.66	32	44	24	LOAM
		B	10-25	5YR4/6		5.01	4.03	0.00	0.11	0.16	0.20	0.47	6.82	6.89	0.17	2.45	14.41	0.00	34	42	24	LOAM
		C	25-90	5YR4/8		5.65	3.95	0.00	0.04	0.04	0.15	0.23	7.39	3.11	0.07	0.86	12.29	0.00	20	40	40	CLAY/CLAY LOAM/SILT CLAY/SILT CLAY LOAM
11	Fle	Ap	0-12	10YR4/6	5YR5/8 40%	5.24	4.11	0.05	0.07	0.49	0.80	1.41	4.93	28.60	0.12	1.42	11.83	1.75	20	62	18	SILT LOAM
		B	12-22	10YR5/4	5YR5/8 60%	5.58	4.30	0.05	0.03	0.82	1.10	2.00	3.41	58.65	0.09	1.08	12.00	1.42	16	66	18	SILT LOAM
		C	22-80	10YR5/4	5YR5/8 50%	5.62	4.48	0.00	0.03	0.66	1.15	1.84	3.03	60.73	0.05	0.72	14.40	8.64	40	46	14	LOAM
9		A				5.35	4.09	0.05	0.14	0.16	0.85	1.20	6.08	19.74	0.12	1.49	12.42	28.96	42	42	16	LOAM

KASKI WEST MODEL AREA

Pit No.	SOIL TYPE	HORIZON	Depth	Color	Mottling	pH H2O	pH KCl	Exchangeable cation(m.e/100g) Na	K	Mg	Ca	TEB	CEC me/100g	B/s (%)	Total N (%)	Organic C (%)	C/N	P_BRAY ppm	TEX_SAND 2—0.05mm	TEX_SILT 0.05—0.002	TEX_CLAY <0.002mm	TEXTURE CLASS
1	Cld	A	0-11	7.5YR4/3	5YR3/6	5.08	4.10	0.10	0.22	0.25	0.00	1.17	9.85	11.88	0.36	3.45	9.58	13.35	22	48	30	CLAY LOAM
		B1	11-40	7.5YR4/4	5YR4/6	5.17	4.00	0.05	0.22	0.49	1.35	2.11	3.94	53.55	0.33	2.69	8.15	2.42	35	46	18	LOAM
		B2	40-65	5YR4/6		5.19	4.03	0.10	0.21	0.82	2.10	3.23	10.82	29.85	0.31	1.71	5.52	0.11	22	42	36	CLAY LOAM
		C	65-100	7.5YR5/6		5.04	3.97	0.05	0.19	0.58	1.50	2.32	9.36	24.79	0.15	0.99	6.60	0.00	18	38	44	CLAY
2	Cld	Ap	0-6	7.5YR4/4	5YR4/8																	
		A1	6-31	10YR4/4	5YR3/6	5.09	4.03	0.10	0.29	0.49	0.90	1.78	10.75	16.56	0.23	2.54	11.04	0.78	34	40	26	LOAM
		B	31-50	5YR4/6		5.21	4.05	0.05	0.28	0.06	1.90	2.89	9.31	31.04	0.14	0.86	6.14	0.00	20	40	40	CLAY/CLAY LOAM/SILT CLAY/SILT CLAY LOAM
3	Cld-kCd	A	0-30	10YR3/4		5.06	3.87	0.05	0.08	0.10	0.25	0.54	13.25	4.08	0.25	4.72	18.88	1.11	44	28	28	CLAY LOAM
		Bc	30-53	7.5YR5/6		5.27	3.94	0.05	0.04	0.16	0.20	0.45	7.34	6.13	0.11	2.41	21.91	0.45	36	50	14	SILT LOAM/LOAM
		C	53-80	7.5YR5/8		5.12	3.99	0.05	0.03	0.08	0.00	0.16	6.05	2.64	0.10	1.00	10.00	0.12	34	50	16	SILT LOAM/LOAM
4	Cld	A1	0-10	7.5YR3/2		5.06	4.08	0.05	0.12	0.08	0.40	0.65	8.06	8.06	0.26	3.89	14.96	1.78	58	34	8	SANDY LOAM
		A2	10-20	10YR4/4-6		5.62	4.20	0.05	0.08	0.08	0.30	0.51	5.19	9.83	0.16	2.45	15.31	0.89	46	44	10	LOAM
		B1	20-35	7.5YR4/4-6		5.23	4.20	0.05	0.05	0.04	0.05	0.19	6.05	3.14	0.15	1.78	11.87	0.12	40	42	18	LOAM
		C	>35	7.5YR5/6		5.51	4.06	0.05	0.03	0.08	0.05	0.21	4.22	4.98	0.09	0.75	8.33	0.23	48	40	12	LOAM
5	Cld	A0	0-15	7.5YR4/3		4.87	3.73	0.10	0.24	0.58	0.85	1.77	15.04	11.77	0.48	6.63	13.81	0.80	48	42	10	LOAM
		B	15-30	7.5YR4/6		5.23	4.00	0.05	0.07	0.08	0.15	0.35	9.13	3.83	0.24	2.96	12.33	0.11	40	50	10	SILT LOAM/LOAM
		C1	30-55	10YR5/6		5.02	4.04	0.05	0.05	0.08	0.08	0.18	9.36	1.92	0.19	2.24	11.79	0.00	38	44	18	LOAM
		C2	55-80	10YR6/6		5.24	4.05	0.05	0.03	0.08	0.05	0.21	4.04	5.20	0.24	0.65	2.71	0.69	64	28	8	SANDY LOAM
6	Cld	A1	0-17	10YR4/3		4.74	3.71	0.05	0.13	0.16	0.70	1.04	13.61	7.64	0.47	5.57	11.85	0.11	46	32	22	LOAM
		A2	17-34	10YR3/4		4.58	3.64	0.05	0.18	0.16	0.40	0.79	17.37	4.55	0.52	6.45	12.40	0.12	36	40	22	LOAM
		B1	34-64	7.5YR3/4		4.49	3.54	0.05	0.16	0.25	0.20	0.66	15.78	4.18	0.52	5.59	10.75	0.69	28	44	28	CLAY LOAM
		B2	64-87	10YR3/4		4.67	3.46	0.05	0.17	0.25	0.15	0.62	14.68	4.22	0.52	5.71	10.98	0.34	46	26	28	SANDY CLAY LOAM
		C	>87	10YR4/4		4.71	3.57	0.05	0.08	0.16	0.20	0.49	13.21	3.71	0.32	3.47	10.84	0.00	36	46	18	LOAM
7	Cld	A	0-20	7.5YR3/2		4.99	3.75	0.10	0.21	0.58	1.35	2.24	16.14	13.88	0.40	6.30	15.75	0.46	50	34	16	LOAM
		B1	20-25	5YR4/4		5.07	4.12	0.05	0.09	0.16	0.30	0.57	6.97	8.18	0.19	2.29	12.05	0.23	40	36	24	LOAM
		B2	25-40	5YR3/6		5.12	4.02	0.05	0.05	0.16	0.35	0.61	4.48	13.62	0.11	1.49	13.55	0.33	38	34	28	CLAY LOAM
		C	40-85	5YR3/6		5.11	4.02	0.05	0.04	0.16	0.60	0.85	3.94	21.57	0.10	1.23	12.30	0.22	38	36	26	LOAM
8	Flc/Fle	Ap	0-10	7.5YR5/8	5Y4/2	5.25	4.39	0.05	0.04	0.08	2.00	2.17	3.22	67.39	0.13	1.42	10.92	4.23	40	44	16	LOAM
		B	10-20	2.5Y5/4		5.82	5.27	0.05	0.04	0.33	4.50	4.92	0.18	2733.00	0.08	0.64	8.00	1.15	34	54	12	SILT LOAM
		B	20-28	7.5YR4/4		5.79	5.12	0.05	0.03	0.58	8.00	8.66	1.83	473.20	0.08	0.40	5.00	2.65	42	54	4	SILT LOAM
		C	>28	2.5Y3/1		6.45	6.28	0.05	0.05	1.07	21.50	22.67	1.65	1374.00	0.05	0.40	8.00	0.92	50	44	6	SANDY LOAM
9	Flc	A	0-11	2.5YR5/1		5.31	3.99	0.05	0.08	0.16	0.70	0.99	1.43	69.23	0.12	1.52	12.67	12.35	44	48	8	LOAM
		B1	11-25	10YR5/1		5.29	4.15	0.05	0.02	0.04	0.20	0.31	0.18	172.20	0.09	0.53	5.89	30.50	50	40	4	SANDY LOAM
		B2	25-85	7.5Y5/1		5.37	4.26	0.00	0.01	0.16	0.15	0.32	1.10	29.09	0.02	0.32	16.00	14.91	66	30	4	SANDY LOAM
10	Cld	A1	0-10	7.5YR4/3		5.33	3.86	0.05	0.09	0.16	0.30	0.60	9.85	6.09	0.27	3.82	14.15	0.23	40	44	16	LOAM
		A2	10-30	7.5YR4/4		5.32	3.99	0.05	0.06	0.08	0.45	0.64	5.01	12.77	0.22	2.66	12.09	0.00	28	48	24	LOAM
		B	30-50	7.5YR4/6		5.12	4.02	0.05	0.05	0.16	0.10	0.36	8.62	4.18	0.17	2.35	13.82	0.00	30	42	28	CLAY LOAM
		C	50-85	7.5YR4/6		5.28	3.91	0.05	0.06	0.16	0.15	0.42	2.92	5.59	0.17	1.57	9.24	0.00	30	44	26	LOAM
11	Cld	A	0-20	10YR3/4		5.09	4.02	0.05	0.10	0.08	0.50	0.73	11.28	6.47	0.32	3.68	11.50	0.11	36	42	22	LOAM
		B	20-36	10YR4/6		4.93	4.00	0.05	0.09	0.08	0.30	0.52	10.21	5.09	0.30	3.05	10.17	0.00	26	44	30	CLAY LOAM
		2A	36-60	10YR3/4		5.05	4.03	0.05	0.08	0.16	0.25	0.54	14.31	3.77	0.33	3.94	11.94	0.00	26	44	30	CLAY LOAM
		2B	>60	7.5YR5/4		5.38	3.91	0.05	0.08	0.08	0.15	0.36	10.82	3.33	0.20	1.60	8.30	0.00	16	38	46	CLAY
12	Cld	A	0-10	7.5YR4/6		5.03	3.93	0.10	0.28	0.49	0.65	1.52	9.31	16.33	0.37	4.84	13.08	0.45	42	38	20	LOAM
		B1	10-27	5YR4/8		5.08	4.15	0.05	0.10	0.08	0.15	0.38	7.80	4.82	0.17	1.58	9.29	0.00	24	40	36	CLAY LOAM
		B2	27-46	2.5YR4/8		5.04	3.83	0.05	0.10	0.08	0.05	0.28	7.70	3.64	0.15	1.12	7.47	0.00	30	36	34	CLAY LOAM
		C	>46	10YR4/6		5.12	3.87	0.05	0.08	0.16	0.20	0.49	5.69	8.61	0.10	0.72	7.20	0.00	20	40	40	CLAY/CLAY LOAM/SILT CLAY/SILT CLAY LOAM
13	Cle	Ap	0-10	10YR4/3		5.56	5.18	0.10	0.38	1.56	10.00	12.04	8.78	137.10	0.23	3.11	13.52	83.24	54	28	18	SANDY LOAM
		B	10-35	10YR4/3		5.75	4.66	0.05	0.18	1.32	3.40	4.93	7.58	65.04	0.13	1.80	13.85	82.59	34	46	20	LOAM
		C	>35	10YR5/4		5.62	4.64	0.05	0.17	0.74	1.65	2.61	4.59	56.86	0.08	0.82	10.25	27.52	44	42	14	LOAM
14	Clh	A	0-23	7.5YR2/3		4.87	3.58	0.05	0.16	0.49	1.20	1.90	22.92	8.29	0.49	6.78	13.84	0.22	42	36	22	LOAM
		B	23-36	7.5YR3-4/3		4.83	3.96	0.05	0.11	0.16	0.50	0.82	13.61	6.02	0.39	5.44	13.95	0.00	58	32	10	SANDY LOAM
		BC	>36	10YR4/6		5.07	4.06	0.05	0.08	0.16	0.25	0.54	12.11	4.46	0.30	4.40	14.67	0.00	54	34	12	SANDY LOAM
15	Clh	A	0-22	7.5YR3/2		5.06	3.91	0.05	0.15	0.74	1.85	2.79	14.51	19.23	0.45	5.75	12.78	0.11	56	32	12	SANDY LOAM
		B	22-37	10YR4/6		5.06	4.23	0.05	0.09	0.08	0.25	0.47	12.11	3.88	0.39	4.62	11.85	0.00	42	44	14	LOAM
		C	>37	10YR4/6		4.87	3.98	0.05	0.08	0.16	0.25	0.54	13.21	4.09	0.22	3.56	16.18	0.00	46	42	10	LOAM
16	Cld	A	0-15	7.5YR4/4		5.01	3.91	0.05	0.14	0.25	0.15	0.59	9.17	6.43	0.32	2.94	9.19	1.61	34	44	22	LOAM
		B	15-33	7.5YR5/4		4.83	3.96	0.05	0.08	0.08	0.25	0.46	6.09	7.55	0.30	2.28	7.60	0.00	32	50	18	SILT LOAM/LOAM
		BC	33-40	7.5YR4/4		5.16	4.08	0.00	0.03	0.49	0.15	0.67	7.34	9.13	0.13	1.34	10.31	0.00	32	44	24	LOAM
		C	>40	7.5YR4/6		5.79	3.92	0.05	0.05	0.16	0.15	0.41	7.15	5.73	0.17	1.65	9.71	0.00	28	46	26	LOAM
17	Cld	A	0-17	7.5YR2/4	10YR4/6	4.89	3.92	0.05	0.12	0.08	0.60	0.85	14.68	5.79	0.39	4.26	10.90	0.00	40	38	22	LOAM
		B1	17-29	10YR5/6		5.19	3.99	0.05	0.12	0.16	1.10	1.43	11.46	12.48	0.21	1.98	9.43	0.00	28	40	32	CLAY LOAM
		B2	>29	10YR5/6		5.08	4.08	0.05	0.12	0.16	0.80	1.13	12.47	9.06	0.16	1.49	9.31	0.00	10	42	48	SILTY CLAY
18	Flc	AP	0-12	2.5Y3/2		7.22	7.28	0.05	0.09	1.32	49.75	51.21	5.66	904.80	0.23	2.36	10.20	5.35	38	45	17	LOAM

PARBAT SOUTH MODEL AREA

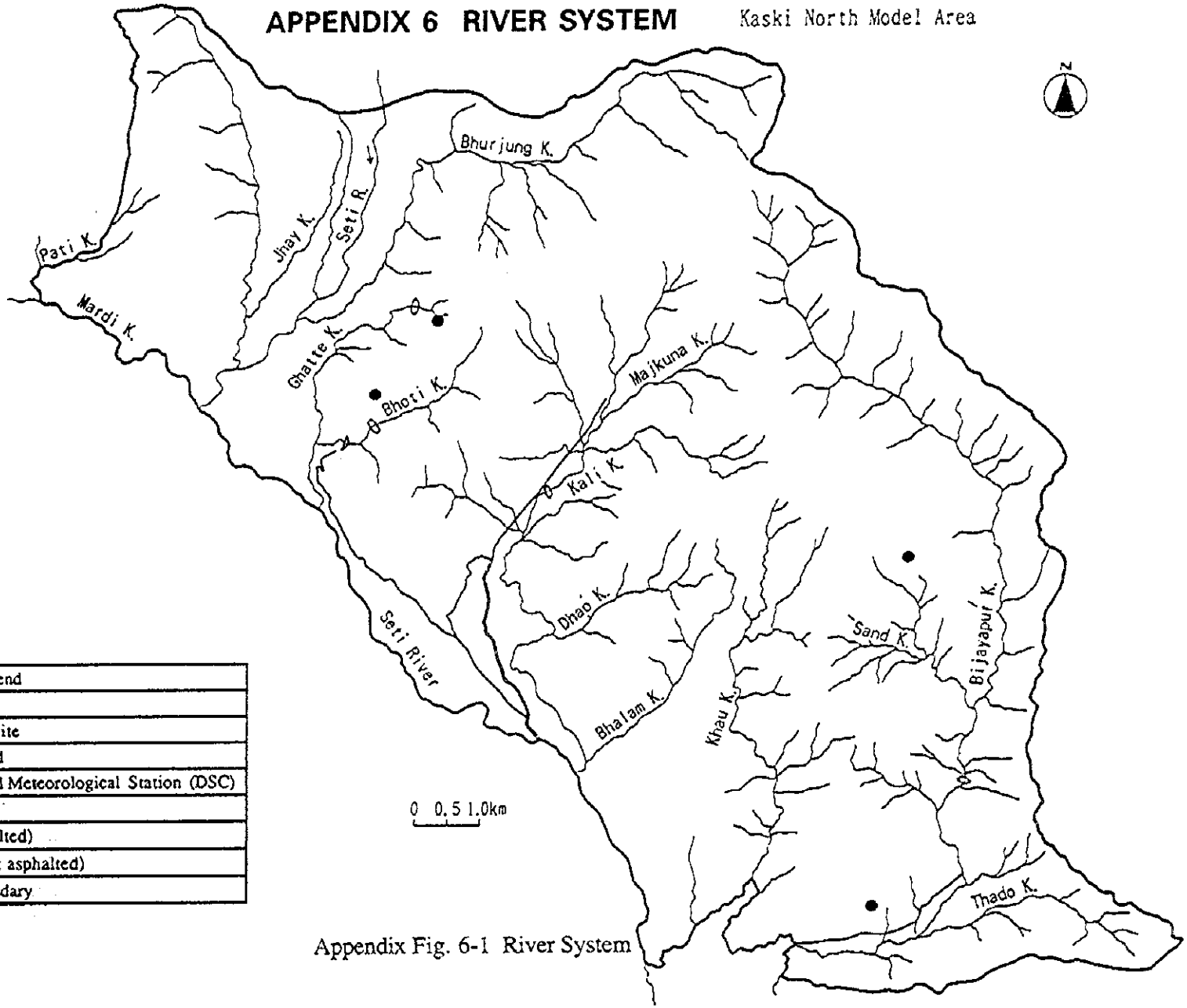
Pit No.	SOIL TYPE	HORIZON	Depth	Color	Mottling	pH H2O	pH KCl	Exchangeable cation(m.e/100g) Na	K	Mg	Ca	TEB	CEC me/100g	B-S (%)	Total N (%)	Oga-C (%)	C/N	TEX-SAND 2~0.05mm	TEX-SILT 0.05~0.002	TEX-CLAY <0.002mm	TEXTURE CLASS 0.05~0.002
1	CMh	Ab	0-25	10YR3/3		5.00	4.95	0.05	0.24	1.81	5.50	7.60	11.75	64.68	0.26	2.83	10.88	48	40	12	LOAM
		C	>60	10YR4/3		5.69	4.70	0.05	0.08	1.64	2.30	4.07	8.94	45.53	0.16	1.37	8.56	36	32	32	CLAY LOAM
2	RGd	Ap	0-15	7.5YR4/6		5.68	4.76	0.00	0.15	1.15	3.20	4.50	5.50	81.82	0.14	1.32	9.43	46	32	22	LOAM
		B	15-45	5YR4/4		5.29	4.08	0.00	0.08	0.53	1.30	1.71	8.04	21.27	0.12	0.00	0.00	32	40	28	CLAY LOAM
		C	>45	7.5YR4/4		5.35	4.10	0.00	0.07	0.41	1.50	1.98	8.40	23.57	0.13	0.98	7.54	32	38	30	CLAY LOAM
3	RGc	Ap(past)	0-15	10YR4/6		6.92	7.01	0.05	0.05	2.14	9.25	11.49	5.36	214.40	0.19	2.21	11.63	32	58	10	SILT LOAM
		B	15-45	10YR4/4		6.98	7.16	0.04	0.05	2.14	9.25	11.49	4.83	237.90	0.17	1.88	11.06	34	58	8	SILT LOAM
		C	45-55	10YR5/4		6.88	7.08	0.00	0.02	2.00	5.50	7.58	1.52	498.70	0.10	0.82	8.20	56	36	8	SANDY LOAM
4	CMh	A	0-15	7.5YR3/2		6.02	5.19	0.10	0.23	3.70	5.60	9.73	14.30	68.04	0.32	3.65	11.41	38	40	22	LOAM
		B	15-33	10YR4/3		5.36	4.27	0.05	0.13	1.23	1.00	2.41	7.86	30.66	0.18	1.55	8.61	30	40	30	CLAY LOAM
		C	>33	10YR4/4		5.24	4.25	0.05	0.13	1.23	1.10	2.51	7.86	31.93	0.19	1.65	8.68	28	42	30	CLAY LOAM
5	LVh	Ap	0-25	2.5YR4/4		6.63	5.77	0.10	0.09	3.29	5.80	9.28	8.58	108.20	0.14	1.26	9.00	20	48	32	CLAY LOAM/SILTY CLAY LOAM
		B	25-60	10YR5/4		6.80	5.78	0.05	0.08	2.47	5.20	7.80	7.33	106.40	0.09	0.72	8.00	26	43	31	CLAY LOAM
		C	60-85	7.5YR3/4		6.74	5.91	0.10	0.14	3.29	6.30	9.83	7.33	134.10	0.08	0.86	10.75	34	40	26	LOAM
6	CMc	Ap	0-15	10YR4/6		6.27	5.37	0.10	0.00	2.06	6.10	8.26	10.01	82.52	0.25	1.86	7.44	26	40	34	CLAY LOAM
		B1	15-40	10YR4/6		6.25	5.61	0.05	0.12	1.64	5.40	7.21	6.43	112.10	0.22	0.98	4.45	14	50	36	SILTY CLAY LOAM
		B2	40-70	7.5YR5/6		6.38	5.28	0.05	0.13	1.48	4.75	6.41	8.22	77.98	0.15	0.71	4.73	14	48	38	SILTY CLAY LOAM
		C	>70	7.5YR4/6		6.49	5.24	0.05	0.11	1.56	5.20	6.92	7.69	89.99	0.16	0.73	4.56	14	44	42	SILTY CLAY
7	RGc	A	0-11	5YR4/4		6.95	6.28	0.05	0.05	2.22	12.25	14.57	9.48	153.70	0.17	1.61	9.47	24	58	18	SILT LOAM
		Ac	11-40	5YR4/6		6.97	7.11	0.05	0.07	2.22	14.75	17.09	7.96	214.70	0.19	1.97	10.37	26	59	15	SILT LOAM
8	CMe	A	0-10	5YR4/4		0.12	5.13	0.05	0.07	2.88	4.20	7.20	8.22	87.59	0.11	1.40	12.73	22	56	22	SILT LOAM
		B	10-75	5YR3/6		5.86	4.53	0.05	0.06	2.06	2.70	4.87	7.51	64.85	0.06	0.63	10.50	20	53	27	CLAY LOAM/SILTY CLAY LOAM/SILT LOAM
		C	>75	2.5YR4/4		5.87	4.31	0.05	0.06	2.47	3.00	5.58	6.97	80.06	0.06	0.58	9.67	18	50	32	SILTY CLAY LOAM
9	Cae/Rgc	A	0-17	10YR4/3		5.76	4.69	0.05	0.06	1.15	2.50	3.76	6.44	58.39	0.12	1.60	13.33	26	66	10	SILT LOAM
		B	17-45	7.5YR4/4		5.63	4.77	0.00	0.04	1.07	1.55	2.66	4.17	63.79	0.06	0.61	10.17	28	50	22	SILT LOAM/LOAM
		C	>45	7.5YR4/4		6.11	5.14	0.10	0.03	0.99	1.00	2.12	2.84	74.65	0.05	0.48	9.60	28	56	16	SILT LOAM
10	RGc	A	0-15	7.5YR3/4		5.73	4.99	0.15	0.66	1.73	4.20	6.74	8.15	82.70	0.26	3.04	11.69	22	42	36	CLAY LOAM
		BC	15-80	7.5YR3/4		5.32	4.07	0.05	0.13	0.41	0.45	1.04	6.25	16.64	0.14	1.41	10.07	18	40	42	CLAY/SILTY CLAY
11	CMd	A	0-10	7.5YR4/3		4.99	4.17	0.05	0.08	0.49	0.35	0.97	4.47	21.70	0.11	1.53	13.91	20	60	20	SILT LOAM
		B	11-55	7.5YR4/4		5.04	4.19	0.05	0.06	0.33	0.15	0.59	5.18	11.39	0.10	1.43	14.30	20	60	20	SILT LOAM
		C	55-87	7.5YR5/6		5.32	4.36	0.05	0.05	0.41	0.45	0.96	5.36	17.91	0.04	0.52	13.00	22	60	18	SILT LOAM
12	FLc/e	Ap	0-25	2.5YR5/4	5YR4/8	6.72	5.68	0.05	0.07	1.64	3.60	5.36	3.57	150.10	0.08	0.93	11.63	20	63	17	SILT LOAM
		B1	25-50	2.5YR4/4		6.65	6.21	0.00	0.08	1.64	3.65	5.37	5.00	107.40	0.07	1.16	16.57	24	60	16	SILT LOAM
		B2	50-85	2.5YR4/6		6.75	6.06	0.00	0.07	1.73	4.05	5.85	2.65	220.80	0.06	0.47	7.83	18	66	16	SILT LOAM
13	CMe/LVc	Ap	0-26	2.5YR5/4		5.88	5.04	0.05	0.10	1.56	4.00	5.71	7.69	74.25	0.13	1.19	9.15	20	48	32	CLAY LOAM/SILTY CLAY LOAM
		B	26-58	2.5YR5/4		6.21	5.08	0.05	0.13	1.64	3.90	5.72	6.79	84.24	0.09	0.85	9.44	16	44	40	SILTY CLAY/SILTY CLAY LOAM
		C	>58	7.5YR5/6		5.93	4.88	0.10	0.21	1.81	2.10	4.22	4.83	87.37	0.07	0.48	6.86	12	44	44	SILTY CLAY
14	CMd	A	0-20	7.5YR4/6		5.27	4.08	0.05	0.06	0.08	0.80	0.99	7.90	12.53	0.15	1.39	9.27	18	48	34	SILTY CLAY LOAM
		B	20-45	5YR4/4		5.27	4.05	0.05	0.06	0.08	0.60	0.79	5.08	15.55	0.10	0.82	8.20	18	44	38	SILTY CLAY LOAM
		C	>45	7.5YR4/6		5.28	4.12	0.05	0.07	0.33	1.00	1.45	6.58	22.04	0.10	0.74	7.40	14	44	42	SILTY CLAY
15	ALh	Ap	0-16	7.5YR5/4		6.12	5.04	0.05	0.13	1.73	4.30	6.21	10.72	57.93	0.19	2.04	10.74	22	52	26	SILT LOAM
		B	16-110	7.5YR4/4		5.97	4.88	0.10	0.23	1.48	3.10	4.91	6.77	72.53	0.14	1.24	9.57	28	48	24	LOAM
		C	>110	7.5YR5/6		5.93	4.76	0.05	0.16	1.40	1.80	3.41	3.75	90.93	0.09	0.71	7.89	16	50	34	SILTY CLAY LOAM
16	CMd	A	0-8	10YR4/6		4.90	3.90	0.05	0.10	0.66	0.40	1.27	11.48	11.06	0.27	3.21	11.89	34	40	26	LOAM
		B	8-30	10YR5/6		4.93	4.04	0.05	4.00	0.08	0.20	4.33	8.09	53.52	0.18	2.04	11.33	18	46	36	SILTY CLAY LOAM
		C	>30	7.5YR5/8		4.88	3.96	0.05	0.06	0.00	0.10	0.21	4.89	4.29	0.14	1.01	7.21	36	30	34	CLAY LOAM
		Bc				5.13	4.07	0.05	0.19	0.16	0.20	0.60	7.58	7.92	0.13	2.16	16.62	38	40	22	LOAM

PARBAT NORTH MODEL AREA

Pit No.	SOIL TYPE	Horizon	Depth	Color	Mottling	pH H2O	pH KCl	Exchangeable cation(m.e/100g) Na	K	Mg	Ca	TEB	CEC me/100g	BASE SAT (%)	Total N (%)	org-C (%)	C/N	P BRAY ppm	TEX-SAND 2~0.05mm	TEX-SILT 0.05~0.002	TEX-CLAY <0.002mm	TEXTURE CLASS
1	RGd	Ap(past)	0-18	5YR4/6		5.18	4.25	0.05	0.14	0.08	0.40	0.67	5.46	12.27	0.28	3.66	13.07	0	50	30	20	LOAM
		Bc	18-40	2.5YR4/6		5.59	4.64	0.05	0.02	0.00	0.20	0.27	1.88	14.36	0.08	0.85	10.63	0	32	48	20	LOAM
2	LVh	A	0-28	2.5YR4/5		5.39	4.27	0.05	0.12	0.49	1.30	1.96	7.71	25.42	0.22	2.14	9.72	8	24	42	34	CLAY LOAM
		B	28-90	10YR4/6		5.92	4.65	0.10	0.26	2.06	2.90	5.32	9.97	53.36	0.15	1.29	8.60	0	20	38	42	CLAY
		C	>90	10YR6/6		5.88	5.05	0.10	0.33	3.29	3.10	6.82	9.22	73.97	0.07	0.52	7.43	0	16	36	48	CLAY
3	RC/LP	A	0-30	10YR3/3		5.41	4.36	0.05	0.10	0.08	0.70	0.93	10.72	8.68	0.32	4.19	13.09	2	34	48	18	LOAM
		C	30-85	10YR5/6		5.45	4.68	0.05	0.06	0.00	0.20	0.31	9.41	3.29	0.21	3.47	16.52	0	36	55	9	SILT LOAM
4	RGd	A	0-8	7.5YR5/6		5.26	4.26	0.05	0.17	0.16	0.70	1.08	5.27	20.49	0.14	1.47	10.50	1	36	44	20	LOAM
		C1	8-40	7.5YR5/6		5.23	4.25	0.05	0.12	0.08	0.60	0.85	5.46	15.57	0.12	1.04	8.67	0	32	46	22	LOAM
		C2	40-85	7.5YR5/8		5.35	4.26	0.05	0.12	0.08	0.80	1.05	3.76	27.93	0.10	0.75	7.50	0	34	44	22	LOAM
5	Cld/RGd	A	0-20	10YR4/3		5.06	4.03	0.05	0.08	0.08	1.50	1.71	12.23	13.98	0.25	2.92	11.68	2	36	38	26	LOAM
		B	20-50	7.5YR4/3		5.12	4.11	0.05	0.06	0.08	1.20	1.39	9.41	14.77	0.21	2.55	12.14	3	20	55	25	SILT LOAM
		C	>80	7.5YR3/2		5.06	4.06	0.05	0.07	0.08	0.90	1.10	13.17	8.35	0.21	3.08	14.67	1	36	48	16	LOAM
6	Cld	A	0-20	10YR3/3		5.29	4.12	0.05	0.09	0.58	1.50	2.22	10.35	21.45	0.21	2.36	11.24	0	34	50	16	SILT LOAM/LOAM
		B	20-55	7.5YR3/2		5.55	4.20	0.05	0.07	0.74	1.90	2.76	12.42	22.22	0.18	2.28	12.67	0	36	49	15	LOAM
		C	>80	7.5YR3/2																		
7	RGd	A	0-18	10YR3/4		5.01	3.83	0.05	0.10	0.41	1.00	1.56	12.79	12.20	0.25	3.20	12.80	0	28	52	20	SILT LOAM
		C	>50	10YR5/4		5.20	3.87	0.05	0.04	0.25	0.50	0.84	12.42	6.76	1.09	1.67	1.53	0	34	52	14	SILT LOAM
8	RGd	A	0-20	5YR3/6		5.21	4.17	0.05	0.07	0.00	0.20	0.32	7.15	4.48	0.16	1.81	11.31	0	28	50	22	SILT LOAM/LOAM
		C	>20	5YR3/6		5.32	4.17	0.05	0.07	0.08	0.40	0.60	6.02	9.97	0.11	1.12	10.18	0	20	48	32	CLAY LOAM/SILT CLAY LOAM
9	Clh	A	0-24	10YR2/3		4.81	3.91	0.05	0.17	0.25	0.20	0.67	19.38	3.46	0.49	7.53	15.37	0	60	28	12	SANDY LOAM
		B	24-50	7.5YR3/4		5.01	4.18	0.05	0.07	0.00	0.00	0.12	11.85	1.01	0.25	2.86	11.44	0	25	39	36	CLAY LOAM
		C	>50	7.5YR4/3		5.05	4.16	0.05	0.07	0.00	0.00	0.12	8.84	1.36	0.23	2.50	10.87	0	16	48	36	SILTY CLAY LOAM
10	Cld	Ap	0-20	5YR4/6		5.46	4.38	0.05	0.06	0.08	1.70	1.89	4.89	38.65	0.16	1.78	11.13	4	28	48	24	LOAM
		B	20-55	5YR4/8		5.54	4.47	0.05	0.05	0.60	1.80	1.90	6.58	28.88	0.12	1.81	15.08	2	24	50	26	SILT LOAM/LOAM
		C	55-85	2.5YR4/6		5.47	4.44	0.05	0.03	0.00	1.30	1.38	4.14	33.33	0.07	0.79	11.29	1	26	46	28	CLAY LOAM
11	Cld	A	0-6	5YR3/3		4.72	3.93	0.10	0.28	0.08	2.00	2.46	9.03	27.24	0.29	4.64	16.00	2	36	40	24	LOAM
		B	6-26	5YR3/4		4.97	4.18	0.05	0.06	0.00	0.10	0.21	5.64	3.72	0.15	2.23	14.87	0	28	47	25	LOAM
		C1	26-76	5YR4/8		5.04	4.15	0.05	0.05	0.00	0.10	0.20	5.08	3.94	0.09	1.18	13.11	0	32	42	26	LOAM
		C2	>76	2.5YR4/6		5.17	4.17	0.05	0.03	0.00	0.20	0.28	3.20	8.75	0.04	0.32	8.00	0	38	40	22	LOAM
12	Clh	A	0-30	7.5YR3/2		4.79	3.94	0.05	0.11	0.08	0.30	0.54	15.80	3.42	0.36	5.96	16.56	0	40	42	18	LOAM
		B	30-60	7.5YR3/4		4.89	4.02	0.05	0.10	0.00	0.20	0.35	13.79	2.54	0.35	5.11	14.60	0	32	44	24	LOAM
		C	>60	5YR4/4		4.87	4.16	0.05	0.05	0.00	0.10	0.21	8.31	2.53	0.21	3.40	16.19	0	68	52	20	SILT LOAM
13	Cld	Ap	0-8	10YR5/4	7.5YR5/6 Some+	5.09	4.13	0.05	0.07	0.33	0.50	0.95	4.53	20.97	0.15	1.77	11.80	6	22	54	24	SILT LOAM
		B	8-24	10YR5/6		5.17	4.16	0.05	0.06	0.41	0.80	1.32	2.83	46.64	0.09	0.98	10.89	0	16	56	28	SILTY CLAY LOAM
		C1	24-74	10YR5/8		5.32	4.19	0.05	0.05	0.41	0.40	0.91	2.27	40.09	0.09	0.85	9.44	0	16	54	30	SILTY CLAY LOAM
		C2	>74	2.5YR5/6		5.48	4.39	0.05	0.10	1.73	2.30	4.18	7.37	56.72	0.08	0.57	7.13	0	10	42	48	SILTY CLAY
14	RGd	A	0-10	10YR5/8		5.17	4.30	0.05	0.05	0.00	0.40	0.50	2.27	22.03	0.08	1.12	14.00	0	28	52	20	SILT LOAM
		C	10-65	5YR5/8		5.20	4.06	0.05	0.06	0.00	0.40	0.51	3.40	15.00	0.06	0.83	13.83	0	28	42	32	CLAY LOAM
15	RGd	A	0-15	7.5YR4/4		5.35	4.15	0.05	0.06	0.00	0.60	0.71	2.83	25.09	0.09	1.09	12.11	1	36	50	14	SILT LOAM/LOAM
		AC(BC)	15-40	7.5YR4/6		5.18	4.13	0.05	0.05	0.08	0.40	0.58	3.21	18.07	0.07	0.95	13.57	0	26	54	20	SILT LOAM
16	Cld	Ap	0-18	7.5YR4/4		4.88	3.92	0.05	0.07	0.08	0.40	0.60	5.67	10.58	0.15	2.12	14.13	5	24	54	22	SILT LOAM
		B	18-38	7.5YR3/4		5.01	4.12	0.05	0.08	0.08	0.40	0.61	4.72	12.92	0.14	2.07	14.79	4	28	52	20	SILT LOAM
		C	38-60	5YR4/4		5.16	4.22	0.05	0.05	0.08	0.40	0.58	4.72	12.29	0.10	1.64	16.40	5	30	50	20	SILT LOAM/LOAM
17	Cld	A	0-15	10YR3/4		4.81	3.75	0.10	0.26	0.99	0.90	2.25	10.39	21.66	0.30	4.72	15.73	3	38	40	22	LOAM
		B	15-30	10YR4/6		4.84	3.80	0.05	0.22	0.66	0.50	1.43	6.80	21.03	0.23	3.65	15.87	3	34	44	22	LOAM
		C	>30	10YR5/8		5.04	4.03	0.05	0.14	0.08	0.20	0.47	2.83	16.61	0.09	1.33	14.78	1	34	52	14	SILT LOAM
18	ACh	Ap	0-5	2.5YR3/4		5.50	4.43	0.05	0.23	0.99	3.80	5.07	7.94	63.85	0.26	3.59	13.81	2	34	42	24	LOAM
		B1	5-58	5YR4/6		5.11	4.20	0.05	0.06	0.00	0.60	0.71	4.35	16.32	0.15	2.00	13.33	0	18	48	34	SILTY CLAY LOAM
		B2	>58	2.5YR4/4		5.13	4.22	0.05	0.06	0.00	0.20	0.31	6.05	5.12	0.14	2.39	17.07	0	14	48	38	SILTY CLAY LOAM
19	Cld	Ap	0-20	7.5YR4/4		4.98	3.77	0.05	0.07	0.08	0.90	1.10	8.12	13.55	0.17	2.27	13.35	1	12	60	28	SILTY CLAY LOAM
		B	20-60	5YR4/4		5.12	3.81	0.05	0.05	0.00	0.60	0.70	6.24	11.22	0.12	1.67	13.92	0	10	61	29	SILTY CLAY LOAM
		C	60-80	5YR4/8		5.10	3.87	0.05	0.04	0.00	0.60	0.69	5.67	12.17	0.06	0.93	15.50	0	4	60	36	SILTY CLAY LOAM
20	Alh	A	0-8	7.5YR5/6		5.39	4.21	0.05	0.13	0.66	1.00	1.84	3.78	48.68	0.12	1.29	10.75	0	26	42	32	CLAY LOAM
		B1	8-35	7.5YR5/6		5.68	4.80	0.05	0.09	1.23	1.60	2.97	4.91	60.49	0.09	0.90	10.00	0	22	45	33	CLAY LOAM
		C	35-60	7.5YR4/8		5.70	5.17	0.05	0.13	1.64	1.60	3.42	4.35	78.62	0.04	0.29	7.25	0	33	36	34	CLAY LOAM
		B2	>60	7.5YR4/8		5.58	4.99	0.05	0.11	1.32	1.40	2.88	3.59	80.22	0.06	0.66	11.00	0	30	36	34	CLAY LOAM
21	LpA	A	0-8	10YR3/2		6.44	5.98	0.05	0.14	1.40	10.30	11.80	7.56	157.30	0.21	2.82	13.43	1	42	40	18	LOAM
		K																				
22	Clc	A	0-14	10YR4/3		5.40	4.17	0.05	0.11	0.82	2.70	3.68	6.80	54.12	0.18	2.37	13.17	5	22	54	24	SILT LOAM
		B	14-74	10YR4/4		5.54	4.25	0.05	0.11	0.74	2.80	3.70	6.05	61.16	0.15	1.55	10.33	3	22	53	25	SILT LOAM
		C	>74	10YR3/2		5.76	4.80	0.05	0.10	1.48	4.30	5.93	7.37	80.46	0.11	1.46	13.27	3	24	50	26	SILT LOAM/LOAM
23	Cld	A	0-24	10YR3/4		5.56	4.40	0.10	0.30	0.90	2.80	4.10	8.31	49.34	0.24	3.22	13.42	5	32	53	15	SILT LOAM
		B	24-48	5YR3/3		5.35	4.15	0.05	0.14	0.49	1.40	2.08	8.50	24.47	0.17	2.41	14.18	1	24	57	19	SILT LOAM
		C	>48	5YR3/3		5.08	4.07	0.05	0.06	0.16	0.80	1.07	8.69	12.31	0.18	1.99	11.06	0	60	58	22	SILT LOAM

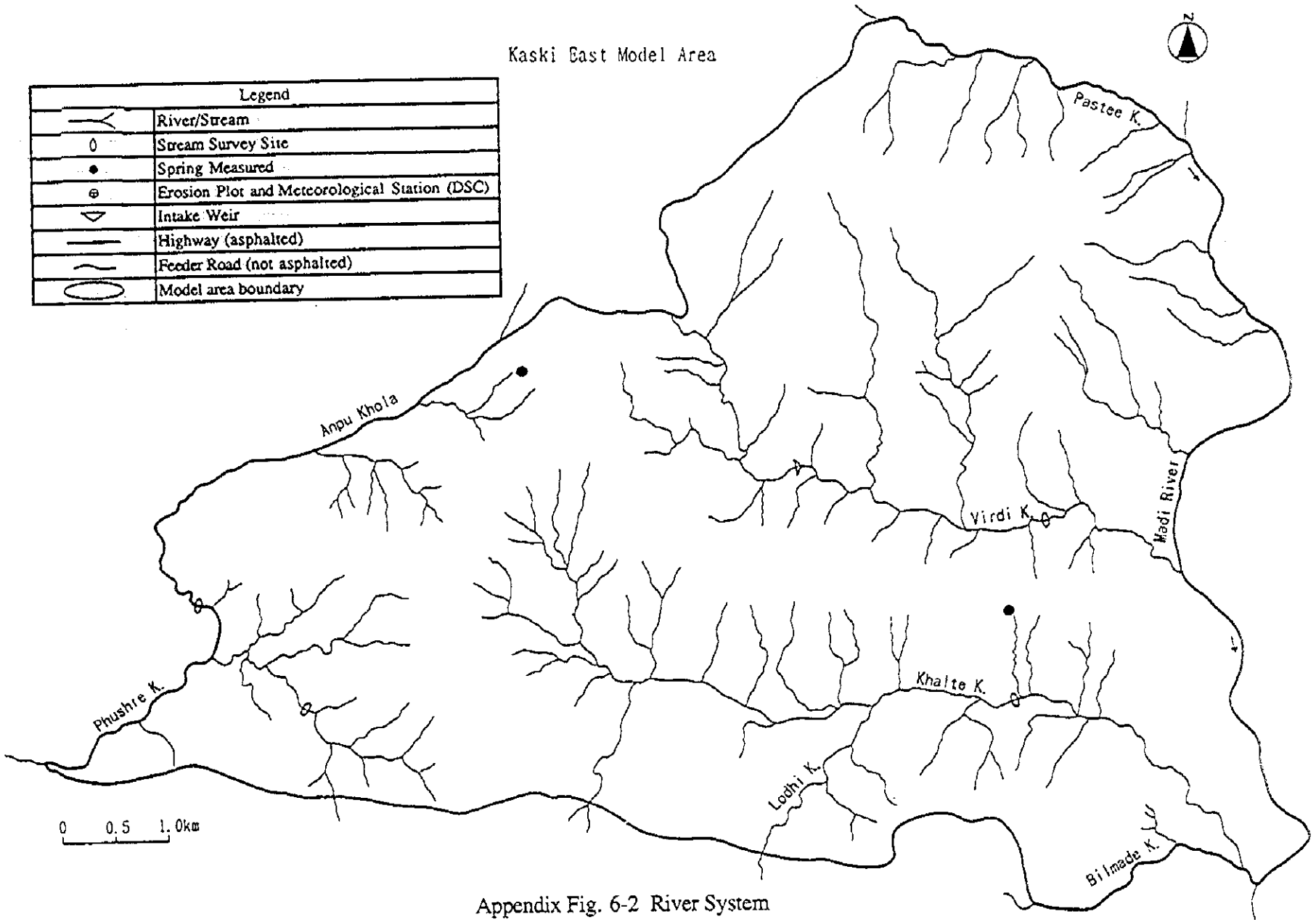
APPENDIX 6 RIVER SYSTEM

Kaski North Model Area

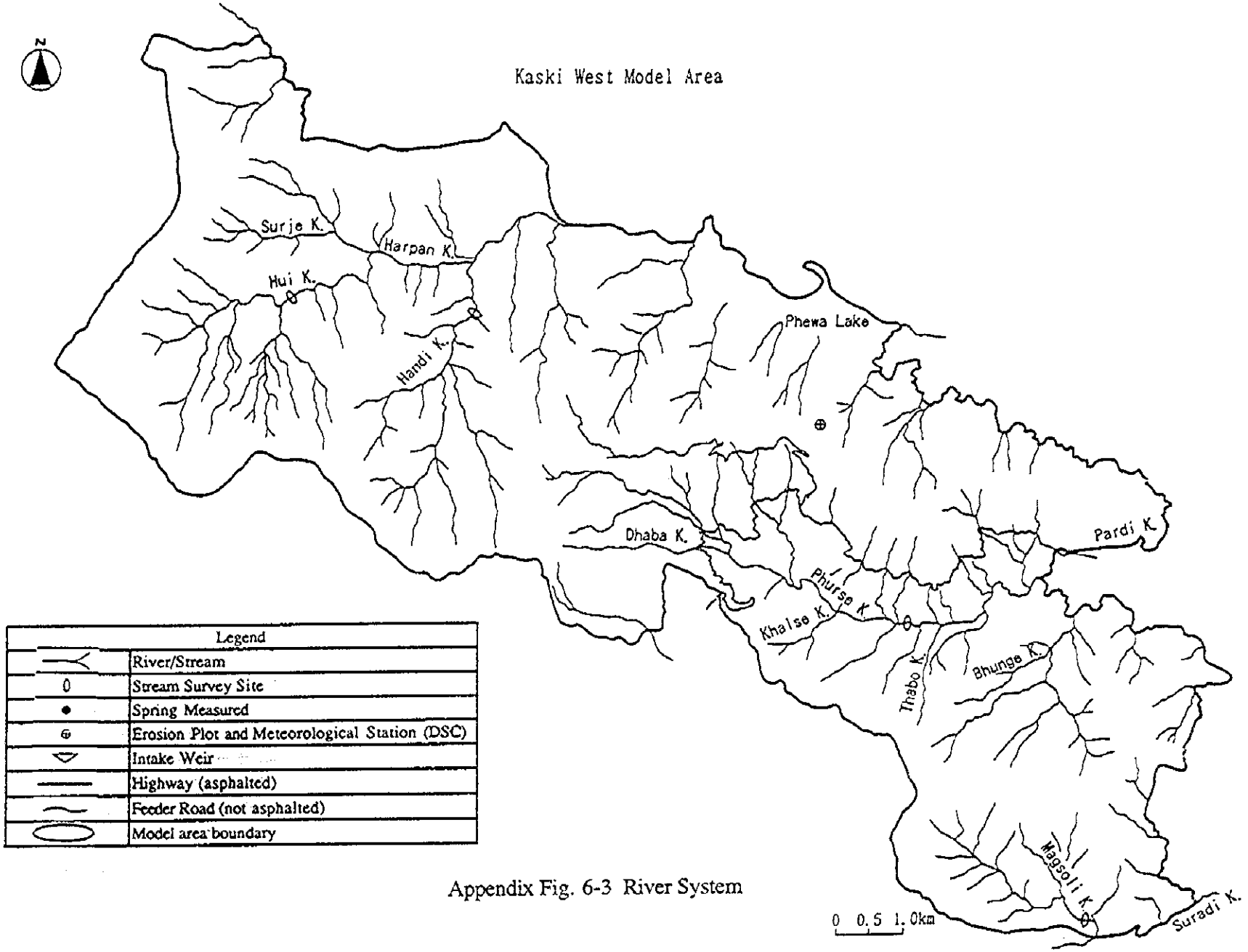


Legend	
	River/Stream
0	Stream Survey Site
•	Spring Measured
⊕	Erosion Plot and Meteorological Station (DSC)
	Intake Weir
	Highway (asphalted)
	Feeder Road (not asphalted)
	Model area boundary

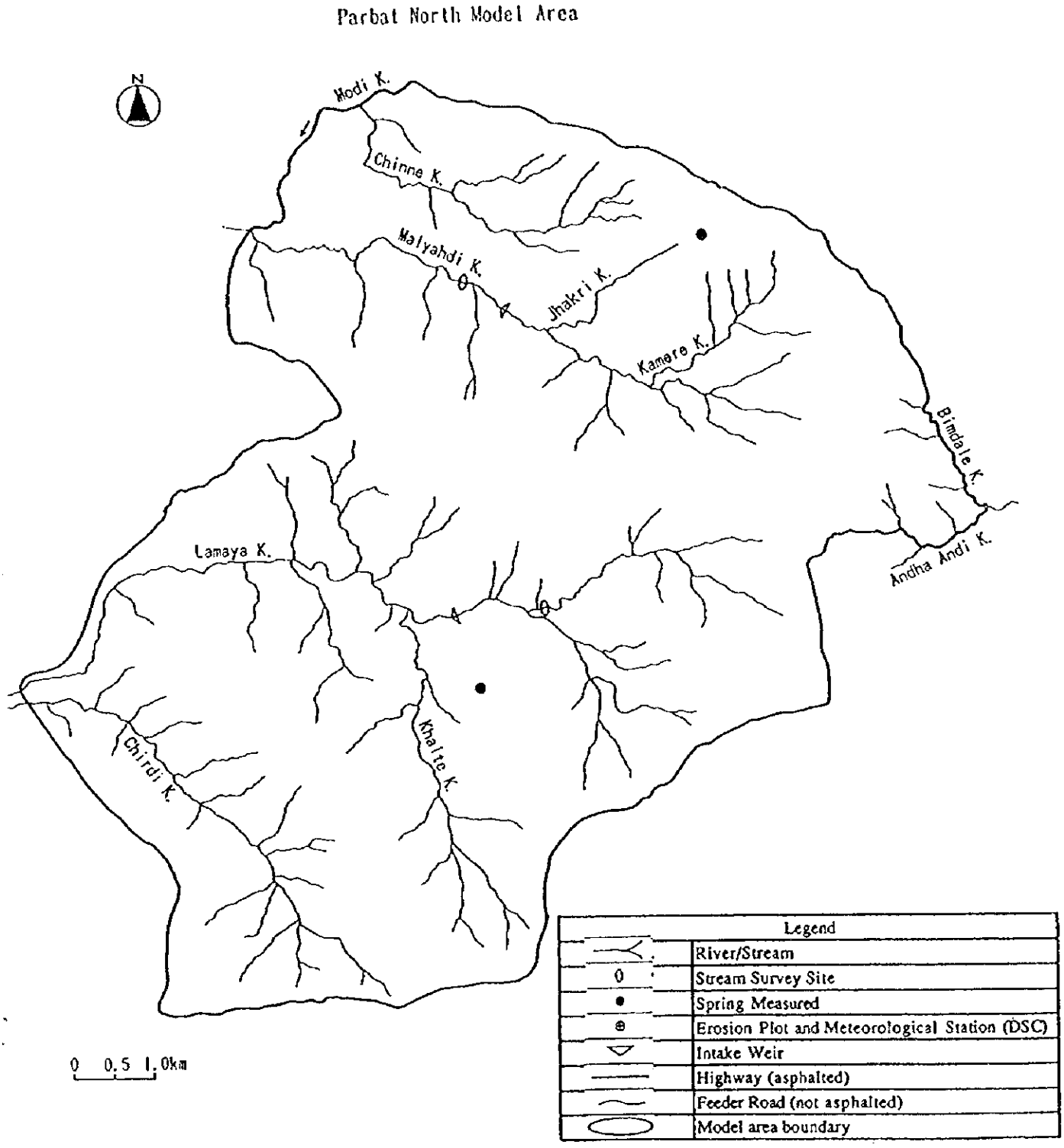
Appendix Fig. 6-1 River System



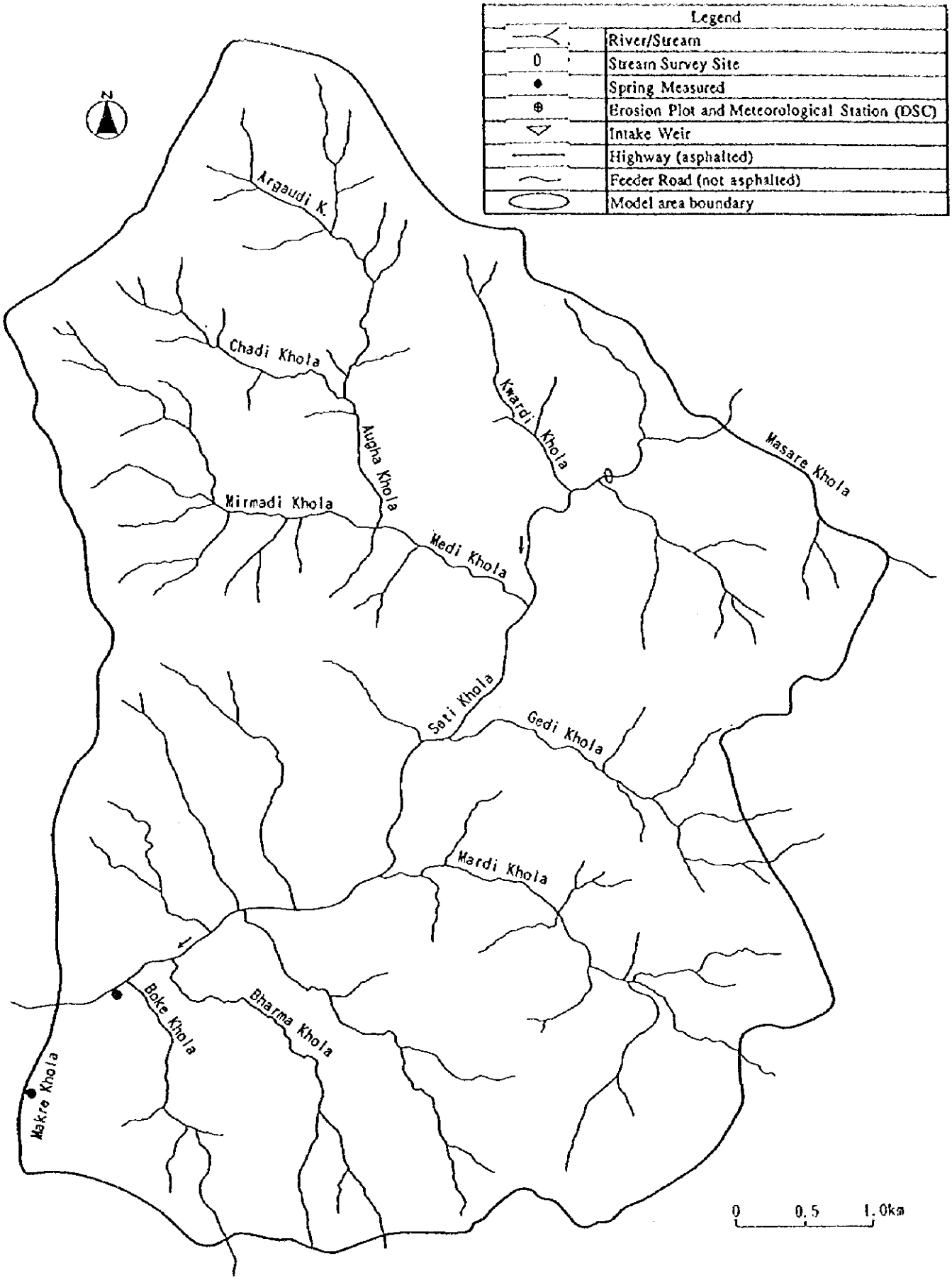
Appendix Fig. 6-2 River System



Appendix Fig. 6-3 River System



Appendix Fig. 6-4 River System

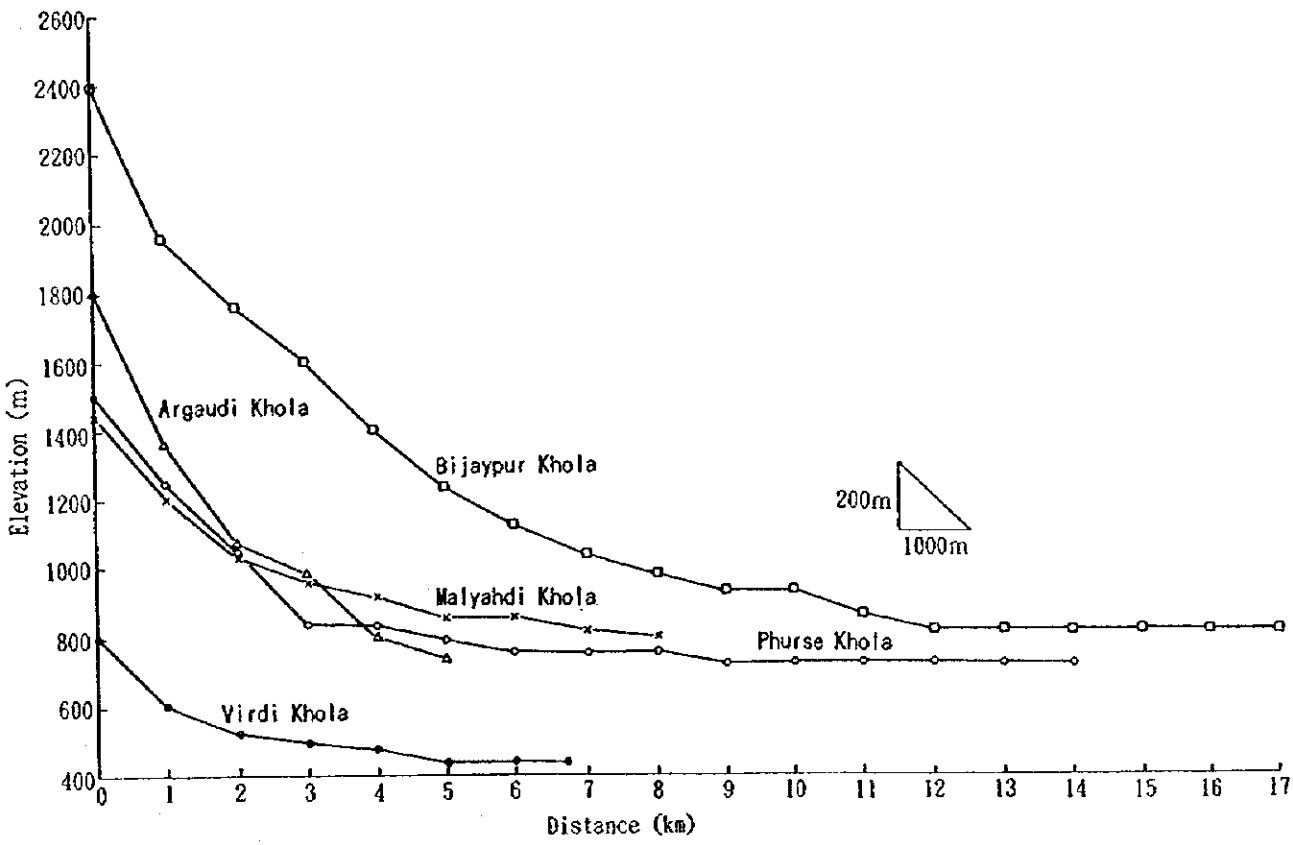


Appendix Fig. 6-5 River System

Appendix Table 6-1 Rivers/Main Kholas in Model Areas

Model Area	River	Main Tributary khola	Length (m)	Remarks
Kaski North	Seti River	---	16,000	The part flowing inside the Model Area.
	Seti River	Bijaipur Khola	17,200	
		Kali Khola	11,000	
		Bhoti Khola	5,200	
		Bhurjung Khola	10,000	
		Mardi Khola	4,500	The part flowing inside the Model Area.
Kaski East	Madi River	---	9,000	The part flowing inside the Model Area.
	Madi River	Paste Khola	3,700	
		Virdi Khola	6,700	
		Khalte Khola	9,500	
	Seti River	Anpu-Pushre Khola	8,200	The part flowing inside the Model Area.
Kaski West	Seti River	Harpan Khola	16,500	Flows into Phewa Lake
		Phurse Khola	14,000	
		Suraudi Khola	1,500	The part flowing inside the Model Area.
Parbat North	Kaligandaki (does not flow inside the Model Area)	Chinne Khola	6,500	
		Malyahdi Khola	8,200	
		Lamaya Khola	12,000	
		Chirdie Khola	6,500	
Parbat South	Kaligandaki (does not flow inside the Model Area)	Seti Khola	7,700	
		Medi (Argaudi) Khola	5,000	A tributary of Seti Khola.
		Mardi Khola	3,200	A tributary of Seti Khola. The part flowing inside the Model Area.

Note. All figures for the river/stream lengths are measured on topographical maps with a scale of 1/25,000.



Appendix Fig. 6-6 Longitudinal Profiles of Some of the Kholas in the Model Areas

APPENDIX 7 SOCIOECONOMIC BASELINE SURVEY DATA

Appendix Table 7-1 Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	household (No.)	Dominant tree species			Usage of forest			Watch-man	Rules
									Fuelwood	Fodder	Timber		
1. Arjaha Bijaya	formal	7	7	150.0	38	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	formal	8	8	80.0	50	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	1	1	150.0	100	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	2	2	5.0	80	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	3	3	5.0	53	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	4	4	5.0	74	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	5	5	40.0	79	Katus	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	6	6	5.0	111	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	9	9	30.0	28	Katus	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
2. Armala	Under pro.	1,2	1,2	23.5	425	Utish	Chilaune	Mallato	Fuelwood	Fodder		Yes	Yes
	Under pro.	3-5	3-5	157.75	433	Utish	Chilaune	Mauwa	Fuelwood	Fodder		Yes	Yes
	Under pro.	6-7	6,7,15*	71.75	388	Utish	Chilaune	Mallato	Fuelwood	Fodder		Yes	Yes
	Under pro.	8-9	7,8,9	84.15	208	Utish	Chilaune	Mauwa	Fuelwood	Fodder		Yes	Yes
3. Lahachowk	Formal	1	1-7	98.3	107	Utish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	1	1,2	3.5	72	Utish	Chilaune	Sirla	Fuelwood	Fodder	Timber	Yes	Yes
4. Rakhi	Formal	5	2-9	25.0	600	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	7	2-9	125.0	600	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	9	2-9	25.0	600	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	1	1,2	5.0	110	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	5	5	5.0	59	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	7	7	1.75	50	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	Yes	Yes
5. Bildujure	Formal	8	8 &8^	32.0	207	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	9	8 &8^	23.0	207	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
6. Mauja	Formal	6	6	65.0	44	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	1,4	1,3,4	360.0	219	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	2	2	35.0	19	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	5	5	52.5	65	Utish	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	7,8,9	7,8,9	215.0	106	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
7. Kanbu	Formal	8	8	13.0	39	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	9	9	10.0	60	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	8	7,8	8.0	81	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	1,4,6	1-7 &(3,4-)	47.0	391	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	2	1,2	20.0	98	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	3,5	3,5	37.5	67	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
8. Kalika	Formal	3	3	40.0	134	Chilaune	Katus		Fuelwood	Fodder	Timber	Yes	Yes
	Formal	6	6	10.0	92	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	No	Yes
	Under pro.	9	9	125.0	139	Chilaune	Katus	Sal	Fuelwood	Fodder	Timber	No	Yes
9. Puranchaur	Formal	6	6	6.17.	84	Chilaune	Katus	Bhorla	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	1,7	6-9	24.94	99	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	3,4	3,4	18.25	48	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	3	3	35.0	60	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	1,3	3,4	55.0	115	Chilaune	Katus	Chandan	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	5	5	20.0	48	Chilaune	Katus	Chandan	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	1,3	1-5,7-9	138.0	435	Chilaune	Katus	Mallato	Fuelwood	Fodder	Timber	Yes	Yes
10. Sardikhola	Under pro.	4	4	70.0	32	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber		Yes
11. Lamachour	Formal	1	1,2	2.83	74	Utish	Siaw		Fuelwood	Fodder	Timber	Yes	Yes
	Formal	7	9	13.76	60	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	7,8	8,9	9.12	52	Chilaune	Katus	Utish	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	9	9 & 15*	13.30	54	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	6	1-6	10.90	41	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	4	4	9.60	56	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	7	7	4.25	19	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	7	7	4.00	12	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	7	7	3.75	11	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	5	5	6.00	50	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	6	5,6	5.00	35	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	7	6	1.00	91	Chilaune	Katus	Kafal	Fuelwood	Fodder	Timber	Yes	Yes

Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	household (No.)	Dominant tree species			Usage of forest			Watch-man	Rules
									Fuelwood	Fodder	Timber		
12 Bhalam	Formal	1	1,2,7 & 16*	40.00	300	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	5,9	5-9	6.00	70	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	3	3	4.00	87	Chilaune	Katus	Uttish	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	4	4	1.00	54	Chilaune	Katus	Uttish	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	5	5	7.00	51	Chilaune	Katus	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	6	6,7	1.25	45	Chilaune	Katus	Uttish	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	7	6,7	6.00	108	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes
	Under pro.	8,9	7-9	15.15	100	Chilaune	Katus	Tiju	Fuelwood	Fodder	Timber	Yes	Yes

* Pokhara Municility W#16

~ Bhalam VDC

^ Kalika VDC

Under pro. = Under process to be make formal community Forest.

Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	household (No.)	Dominant tree species			Usage of forest			Watch-man	Rules
									Fuel wood	Fodder	Timber		
1.Deurali	formal	2	2,3	100.0	212	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	under	1	1	25.0	47	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	under	3	3	50.0	87	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	under	6	6	50.0	48	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	under	7	7	10.0	37	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	4	4	7.3	59	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	5	5	40.0	70	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	8	8	25.0	47	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	9	9	55.0	70	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
2. Sidda	Under	8,9	8,9	22.5	144	Sal	Chilaune	Katus	Fuel wood	Fodder	Timber	No	Yes
	Informal	1	1	8.3	90	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	2	2	8.3	35	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	3	3	8.3	43	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	4	4	12.5	78	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	5	5	7.5	45	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	6	6	8.5	78	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	7	7	25.0	133	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
3. Thumki	Informal	1	1_3	20.0	52	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	2	1,2,4	120.0	55	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	3	3,5	4.75	80	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	4	2,4	30.0	93	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	5	5,7	250.0	130	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	6	6	5.0	71	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	7	7	27.5	112	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	8	8	70.0	113	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	9	7,9	50.0	122	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes

Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	household (No.)	Dominant tree species			Usage of forest			Watch-man	Rules
									Fuelwood	Fodder	Timber		
1. Bhadaure Tamangi	Formal	1	1	18.0	100	Uttish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	No	Yes
	Formal	2	2	14.0	40	Uttish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	No	Yes
	Formal	3	3	25.0	49	Uttish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	No	Yes
	Formal	6	4,6,9	30.0	190	Uttish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	No	Yes
	Formal	7	7	1.0	46	Uttish	Chilaune	Mauwa	Fuelwood	Fodder	Timber	No	Yes
	Formal	8	8	15.0	41	Uttish	Salla	Raktachandan	Fuelwood	Fodder	Timber	No	Yes
	Formal	9	9	11.0	40	Uttish	Salla	Raktachandan	Fuelwood	Fodder	Timber	No	Yes
	Formal	4	4	41.0	137	Katush	Chilaune	Mallato	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	5	5	36.0	139	Sal	Chilaune	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	4	4	95.0	137	Katush	Chilaune	Salla	Fuelwood	Fodder	Timber	No	Yes
	Informal	5	5	25.0	139	Salla	Chilaune	Mauwa	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	1,3,7,8,9	1-4,6-9	1300.0	1350	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
2. Kristi Nachnechaur	Formal	1	1,7	24.00	59	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	1	4,6,9	54.75	303	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	1	1,7	50.00	200	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	2	2	15.00	70	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	3	2,3	43.00	99	Tiju	Chilaune	Katus	Fuelwood	Fodder		Yes	Yes
	Under Pr.	4	4	9.00	170	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	7	7	30.00	75	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	under Pr.	8	8	3.00	81	Tiju	Chilaune	Katus	Fuelwood	Fodder		Yes	Yes
3. Chapakot	Formal	8,9	8,9	78.0	115	Lapsi	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Formal	7	7	17.5	118	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	5,6	3,5,6	29.0	130	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	4	4	50.0	100	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Formal	3	3	74.0	34	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	1,2	1,2	90.0	87	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	6	6	40.0	50	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	8	8	2.0	45	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	8,9	7,8,9	192.0	368	Lapsi	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	7	6,7,9	19.5	200	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	4	3,4,5	3.0	120	Jamun	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	3	3,4,5	274.0	197	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
4. Pumdi Bhumdi	Formal	8	8	6.00	36	Uttish	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Formal	6	6	121.50	190	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	5	5	93.00	207	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	4	4	3.00	100	Uttish	Chilaune	Piyun	Fuelwood	Fodder	Timber	No	Yes
	Formal	3,5	2,3,5	83.00	220	Mauwa	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	2	2,4	10.00	200	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Formal	1	1,3	10.50	43	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Under Pr.	9	9	15.00	70	Katus	Chilaune		Fuelwood	Fodder	Timber	No	Yes
	Informal	7,8	7,8	203.00	270	Chandan	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	9	9	14.00	116	Sal	Chilaune	Katus	Fuelwood	Fodder	Timber	No	Yes
	Informal	2	2	30.00	400	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	Yes	Yes
	Informal	1,3	1,3	200.00	250	Tiju	Chilaune	Katus	Fuelwood	Fodder	Timber	No	No

Under Pro. = Under Process to be make formal community Forest

Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	household (No.)	Dominant tree species				Usage of forest Fuel wood	Fodder	Timber	Watchman	Rules
1. Katuwa Chaupari	Informal	9	9	5.0	120	Sallo	Sishou	Chilaune	Katus	Fuel wood	Fodder	Timber	Yes	No
	Formal	1,2	2	2.0	58	Chilaune	Katus	Tiju	Sisau	Fuel wood	Fodder	Timber	Yes	Yes
	Under Pro.	1	1	7.0	50	Sal	Katus	Sisau		Fuel wood	Fodder	Timber	Yes	Yes
	Under Pro	8	8,9	5.0	46	Sisau	Salla			Fuel wood	Fodder	Timber	Yes	Yes
2. Thapathana	Formal	1	1 to 8	6.0	331	Rahachan	Mauwa	Chilaune	Utish	Fuel wood		Timber	No	Yes
	Formal	2	1 to 6	23.5	331	Mauwa	Rahachan	Ourans		Fuel wood		Timber	No	Yes
	Formal	4	3,4,6	8.0	124	Sallo	Chilaune			Fuel wood		Timber	No	Yes
	Formal	5	3,5	5.0	94	Sallo	Utish			Fuel wood		Timber	No	Yes
	Formal	6	3,4,6	1.0	124	Sallo	Chilaune			Fuel wood		Timber	No	Yes
	Formal	7	6,7	5.0	188	Sal	Chilaune	Sallo		Fuel wood		Timber	No	Yes
	Formal	8	8,9	3.0	146	Chilaune	Sallo	Mauwa		Fuel wood		Timber	No	Yes
	Formal	9	8,9	7.0	148	Chilaune	Katus	Mauwa		Fuel wood		Timber	Yes	Yes
	Informal	1,2,5,7,8,9	1 to 9	751.0	632	Chilaune	Katus	Sallo		Fuel wood	Fodder	Timber	No	Yes
3. Shankar Pokhari	Formal	1,2,5,7,8,9	1 to 9	71.5	888	Sal	Sallo	Chilaune	Mauwa	Fuel wood	Fodder	Timber	Yes	Yes
	Formal	7	1,2,6,7,8	3.0	444	Sal	Chilaune	Sallo		Fuel wood	Fodder	Timber	Yes	Yes
	Formal	2	2	4.0	72	Sal	Katus	Chilaune		Fuel wood	Fodder		Yes	Yes
	Informal	1 to 7,9	1 to 9	87.5	500	Sal	Sallo	Tiju		Fuel wood	Fodder	Timber	No	No
4. Kurkunda	Formal	3,6	3,4,5	45.0	149	Sallo	Silamor	Painyu	Utish	Fuel wood	Fodder	Timber	Yes	Yes
	Under Pro.	1	1,2	50.0	72	Sallo	Paichu	Rahachan	Chilaune	Fuel wood	Fodder	Timber	Yes	Yes
	Formal	6	6,7,.9	50.0	162	Sallo	Chailaune	Katush	Rahachan	Fuel wood	Fodder	Timber	Yes	Yes
	Formal	8	8	2.3	53	Sallo	Chilaune	Utish	Paiyun	Fuel wood	Fodder	Timber	Yes	Yes
5. Khaula Lankhuri	Informal	4,8	1 to 9	10.0	482	Chilaune	Katush	Mauwa		Fuel wood	Fodder	Timber	Yes	No
6. Thuli Pokhari	Formal	1,3,4,6,7	1 to 9	48.0	487	Chilaune	Chile	Uthis	Katush	Fuel wood	Fodder	Timber	Yes	Yes
	Informal	1	1	3.0	115	Chilaune	Tiju	Uthis	Katush	Fuel wood	Fodder	Timber	Yes	No
7. P[illegible]ari	Informal	8,9	8,9	1.5	128	Chilaune	Tiju	Katush		Fuel wood	Fodder	Timber	Yes	Yes
8. [illegible]uwa	Informal	1,2,3	1 to 9	22.7	445	Sal	Sallo	Chilaune	Katush	Fuel wood	Fodder	Timber	Yes	Yes
	Under pro	7	7,8	1.5	62	Sal	Sal	Chilaune	Tiju	Fuel wood	Fodder	Timber	Yes	Yes
	Under pro	8	8	5.0	32	Sal	Chilaune	Kaphal			Fodder		Yes	Yes
	Formal	3	3	2.3	65	Sallo	Tiju			Fuel wood	Fodder	Timber	Yes	Yes
	Formal	8	8	10.0	34	Sal	Chilaune	Tiju	Katus	Fuel wood	Fodder	Timber	Yes	Yes
9. Bhangara	Formal	3	3,4,6,7,8	45.0	226	Rahachandan	Okhar	Chilaune				Timber	Yes	Yes
	Under pro	8	8	20.0	43	Utish	Sallo	Chilaune		Fuel wood		Timber	Yes	Yes
	Under pro	9	5,6,7,9	75.0	156	Chilaune	Katush	Vogate		Fuel wood	Fodder		Yes	Yes
	Informal	7	7	15.0	50	Chilaune	Katush	Utish		Fuel wood		Timber	No.	Yes
	Formal	1	1	45.0	83	Chilaune	Sal	Katush		Fuel wood	Fodder		Yes	Yes
	Formal	2	2	7.5	28	Chilaune	Katush	Sal		Fuel wood	Fodder	Timber	Yes	Yes
10. Limithana	Formal	1,2	1,2	53.0	83	Chilaune	Katush			Fuel wood		Timber	Yes	Yes
	Formal	3,4	3,4,5	45.0	98	Chilaune	Katush	Sal		Fuel wood		Timber	Yes	Yes
	Formal	7	7	15.0	35	Katush	Chilaune	Sallo		Fuel wood		Timber	Yes	Yes
	Under pro	8	5 to 8	20.0	169	Katush	Sal	Sallo	Chilaune	Fuel wood		Timber	Yes	Yes
	Informal	9	3,6,9	75.0	135	Katush	Chilaune	Sal		Fuel wood		Timber	Yes	Yes
11. Thapamula	Formal	1	1	50.0	42	Okhar	Utish	Chilaune	Mauwa	Fuel wood	Fodder	Timber	Yes	Yes
	Under pro	2	2	34.5	26	Chilaune	Katush	Mauwa		Fuel wood		Timber	Yes	Yes
	Formal	3	3,4,5	13.0	71	Katush	Mauwa	Chilaune		Fuel wood	Fodder	Timber	Yes	Yes
	Formal	4	3,4	75.0	120	Chilaune	Katush	Sallo				Timber	Yes	Yes
	Formal	9	9	26.0	38	Sal	Chilaune	Katush		Fuel wood	Fodder	Timber	Yes	Yes
	Under pro.	8	8	6.0	31	Sal	Sallo			Fuel wood	Fodder	Timber	Yes	
	Under pro.	5	3,5,6	50.0	111	Katush	Chilaune	Mauwa				Timber	No	No
	Informal	3	3,4,5	78.4	71	Sallo	Paiya	Lakuri		Fuel wood	Fodder	Timber	Yes	Yes
	Informal	7	7,8	10.0	88	Katush	Utish	Mauwa		Fuel wood	Fodder	Timber	Yes	Yes
12. Phalam Khani	Formal	1	1 to 3	5.3	42	Sallo	Paiyu	Utish	Lakuri		Fodder		Yes	Yes
	Formal	4,5	4 to 6	5.9	89	Sallo					Fodder		Yes	Yes
	Formal	8	7 to 9	9.0	54	Utish	Sallo				Fodder		Yes	Yes
	Under pro	2	1 to 3	10.0	42	Mauwa	Chilaune	Sal		Fuel wood	Fodder	Timber	No	Yes
	Under pro	9	4 to 9	9.0	143	Utish	Sallo			Fuel wood	Fodder		No	Yes
13. [illegible]au Deurali	Formal	7	7	9.3	168	Sallo	Paiyu	Utish	Sorsue	Fuel wood	Fodder		Yes	Yes
	Formal	2	2	5.3	47	Sallo				Fuel wood	Fodder		Yes	Yes
	Under pro.	1	1	12.6	110	Sallo	Ourans	Chilaune	Mauwa		Fodder		Yes	Yes
	Under pro.	9	4,8,9	3.4	113	Sallo					Fodder		Yes	No
	Under pro.	5	3 to 5	13.4	130	Mauwa	Chilaune	Katush		Fuel wood	Fodder		Yes	Yes
14. Kurgha	Formal	1	1	3.3	49	Chilaune	Katush	Sisau			Fodder		No	Yes
	Formal	2	2	11.5	66	Sisau	Sallo	Lakuri			Fodder		No	Yes
	Formal	3	3	9.2	85	Chilaune	Sisau						Yes	Yes
	Formal	4	4,5	9.0	97	Chilaune	Sisau	Sallo			Fodder		Yes	Yes
	Formal	7	7,8,9	99.4	214	Utish	Katush	Ourans	Okhar	Fuel	Fodder	Timber	Yes	Yes
	Under pro.	3	1 to 6	8.5	353	Sal	Katush	Chilaune		Fuel	Fodder		Yes	Yes
	Under pro.	8	7,8	8.0	45	Chilaune	Katush	Mauwa	Ourans		Fodder		Yes	Yes
15. Debisthan	Formal	1	1,6	8.5	116	Sallo	Chilaune	Tuni		Fuel wood	Fodder		Yes	Yes
	Formal	3	3,4	5.3	101	Sallo	Sisau	Chilaune		Fuel wood	Fodder		Yes	Yes
	Formal	4	4,5	3.5	113	Sallo	Sisau	Tuni		Fuel wood	Fodder		Yes	Yes
	Formal	5	5	3.6	73	Sallo	Sal	Tuni		Fuel wood	Fodder		Yes	Yes
	Formal	2	2	4.5	34	Sallo	Chilaune	Sal		Fuel wood	Fodder		No	Yes
	Under pro	2	3	3.5	34	Sallo	Chilaune	Sal		Fuel wood	Fodder		No	No
16. Khanigaon	Informal	5,6,8,9	1 to 9	120.0	300	Sal	Sallo	Chilaune	Tiju	Fuel wood	Fodder	Timber	Yes	Yes
	Formal	5,6,9	1 to 9	9.0	125	Sallo	Tiju	Sal		Fuel wood	Fodder	Timber	Yes	Yes
	Formal	1	1,2,7	5.0	100	Sallo	Chilaune			Fuel wood	Fodder		No	No

Profile of Community Forest

V.D.C.	Status	Wards covered	Wards that use forest	Area (ha)	Household (No.)	Dominant tree species	Usage of forest			Watch-man	Rule
							Fuel wood	Fodder	Timber		
1. Tribeni	Formal	7-9	7-9	14.9	136	Chilaune, Khallu, Chalane, Banchlnne, Simal	Fuelwood	Fodder	Timber	Yes	Yes
2. Saraukhola	Under pr.	1-3,5	1-3,5,6,8,9	32.6	390	Sal, Chilaune, Katus, Mauwa	Fuelwood	Fodder	Timber		Yes
	Informal	4,6,8	4-6,8-9	8	271	Chilaune, Katus	Fuelwood	Fodder	Timber		Yes
3. Beulibas	Formal	1,3,6	1-9	60	340	Sal, Katus, Chilaune, Tuni	Fuelwood	Fodder	Timber	Yes	Yes
	Under pr.	1,3,6	1,9 of Horsyangdi	94	83	Sal, Chilaune	Fuelwood	Fodder	Timber	Yes	
4. Huwas	Formal	1	1,2	17	141	Sal, Chilaune, Mauwa	Fuelwood	Fodder		No	Yes
	Under pr.	5	5-7	12	123	Sisao, Salla, Lakuri, Katus	Fuelwood	Fodder	Timber	No	Yes
	Under pr.	9	9	25	309	Katus, Chilaune, Khallu	Fuelwood	Fodder		Yes	Yes
	Informal	2	1,2	3	141	Katus, Chilaune, Mauwa	Fuelwood	Fodder		Yes	Yes
	Under pr.	8	8	0.5	54	Katus, Chilaune, Sal	Fuelwood	Fodder		No	No
	Formal	3	3	12.5	57	Katus, Chilaune	Fuelwood	Fodder		Yes	Yes
5. Bhorle	Under pr.	5	5,7 of Saraukhola	24.5	157	Chilaune, Katus	Fuelwood	Fodder		Yes	Yes
	Informal	4	4	0.5	68	Chilaune, Katus	Fuelwood	Fodder		Yes	Yes
6. sing	—	--	--	--	--	--	--	—	--	--	--
7. Horsyangdi	Formal	2	1-3	6.5	129	Katus, Chilaune, Mauwa	Fuelwood	Fodder		Yes	Yes
	Formal	5	5	84	53	Khanyu, Okhar, Mauwa, Guras, Chilaune	Fuelwood	Fodder	Medical	No	Yes
	Under pr.	6,7	6-8	25	86	Mauwa, Jhyamu, Chilaune	Fuelwood	Fodder		No	No
	Under pr.	5	5	6	28	Okhar, Mauwa, Guras, Angeru	Fuelwood	Fodder		Yes	No
	Under pr.	1,4	1,4	6	85	Mauwa, Chilaune, Kharsu, Chautano	Fuelwood	Fodder		Yes	Yes
	Under pr.	9	9	10.5	66	Chilaune, Guras, Katus	Fuelwood	Fodder		No	No
8. Balakot	Under pr.	1,8	1,5,7-9	6.5	125	Chilaune, Mauwa, Utis	Fuelwood	Fodder		Yes	Yes

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Sample No._____

Appendix Table 7-2 Household Survey Questionnaires

HOUSEHOLD SURVEY

M D Y

Date : ___/___/___ *FN1*

Enumerator : _____*FN2*_____

Name of VDC : _____*FN3*_____

Ward No. : _____*FN4*

Tol (settlement) : _____*FN5*_____

Ethnic Group : *FN6*

Code for ethnic group

1. Brahman	4. Gurung	7. Kunwar	10. Sarki
2. Chhetri	5. Jogi	8. Magar	11. Suner
3. Damai	6. Kami	9. Newar	12. _____

SECTION 1 GENERAL INFORMATION

I-1 Name of interviewee. _____*FN7*_____ Sex: M / F *FN8* Age : __*FN9*_

I-2 Total number of household members ____*FN10*__ persons

I-3 Household members in the same house including the interviewee and temporal absentees.

	SEX Sex	*AGE* Age	*EDU* Education	*FARM* Farming #1 (Y / N)	*OCC* Main Occupation	*PA* Present / Absent #2	*ORG* Organization	
1.	M / F	_____	_____	_____	_____	P / A	_____	Head
2.	M / F	_____	_____	_____	_____	P / A	_____	
3.	M / F	_____	_____	_____	_____	P / A	_____	
4.	M / F	_____	_____	_____	_____	P / A	_____	
5.	M / F	_____	_____	_____	_____	P / A	_____	
6.	M / F	_____	_____	_____	_____	P / A	_____	
7.	M / F	_____	_____	_____	_____	P / A	_____	
8	M / F	_____	_____	_____	_____	P / A	_____	
9.	M / F	_____	_____	_____	_____	P / A	_____	
10.	M / F	_____	_____	_____	_____	P / A	_____	
11.	M / F	_____	_____	_____	_____	P / A	_____	

Note: #1: Asking whether or not he / she engages in farming.
#2: "P" means he / she live in the house throughout the year
"A" means he / she live in other places more than three months in a year.

Code for education:
0. No formal education
1 - 10: Class attainment
11. SLC passed
12. Campus graduate (IA)
13. More than college graduate (BA)

Code for occupation:
1. Salary worker
2. Wage labor
3. Private business
4. Farmer
5. Student
6. Pension receiver
7. Child (below school age)
8. No job

Code for organization
1. Member of mother's club
2. Member of farmer's club
3. Member of Youth club
4. Member of 4-H club
5. Member of ethnic org.
6. Member of religious org.
7. Member of users' group (specify _____)
8. Member of other organization
9. Non-member

Sample No._____

I-4 Cash income sources of the family.
(please indicate the order of importance, 1, 2, 3 ....).

		Importance
1.	Selling crops	_____*FN11*
2.	Selling livestock / dairy products	_____*FN12*
3.	Selling forestry products	_____*FN13*
4.	Salary from permanent job	_____*FN14*
5.	Wage from temporary jobs	_____*FN15*
6.	Pension	_____*FN16*
7.	Remittance from family	_____*FN17*
8.	Private business	_____*FN18*
9.	Others1 : (_____)	_____*FN19*
10.	Others2 : (_____)	_____*FN20*
11.	Others3 : (_____)	_____*FN21*

I-5 When did your household settle in the place? _____*FN22*

Code for answer:
1. Within the last 10 years
2. From 10 to 20 years ago
3. From 20 to 30 years ago
4. More than 30 years ago

SECTION II LIVING CONDITION

II-1 Drinking Water

	Main source (Choose one)	Distance (go and back) (including time for waiting)	Sufficiency
Dry Season	_____*FN23*	_*FN24*_ minutes	_____*FN25*
Wet Season	_____*FN26*	_*FN27*_ minutes	_____*FN28*

Code for source :
1. Piped water
2. Springs (natural)
3. River
4. Rain water
5. Others

Code for sufficiency :
1. Sufficient
2. Just enough
3. Short
4. Very short

II-2 Source of fuel for cooking/heating.
(Choose up to 3 important items and answer the availability)

		Importance (1, 2, 3)	Availability
1.	Fuel wood	1_____*FN29*	1_____*FN30*
2.	Biogas	2_____*FN31*	2_____*FN32*
3.	Crop residue	3_____*FN33*	3_____*FN34*
4.	Cow dung	4_____*FN35*	4_____*FN36*
5.	Gas cylinder	5_____*FN37*	5_____*FN38*
6.	Kerosine	6_____*FN39*	6_____*FN40*

Code for availability
1. Easily available
2. Difficult to obtain
3. Very difficult to obtain

Sample No._____

II-3 Annual consumption of fuelwood by source

1. Own harvest ___FN41_ bhari/year (1 bhari = __FN42__ kg)
   Charge, if any ___FN43__Rs/ kg
2. Purchased __FN44_ bhari/year (1 bhari = __FN45__ kg)
   Price : ___FN46__Rs/ kg
3. Total __FN47_ bhari/year

II-4 Distance to main fuelwood forests. Source-1.__FN48__ minutes (one way)
Source-2.__FN49__ minutes (one way)
Source-3.__FN50__ minutes (one way)

II-5 Food condition /availability of household (for your own products / harvest)

	Condition	Shortage in months in a year
Cereals	____FN51__	__FN52_ months/year
Vegetables	____FN53__	__FN54_ months/year
Meat	____FN55__	__FN56_ months/year

Code for condition:
1. Own harvest / product exceeds the household demand.
2. Own harvest / product is just enough to meet the household demand.
3. Purchased or exchanged to meet the household demand.
4. Do not consume the food item.

II-6 Major diseases (please list the major diseases your family had in the last one year)

1. __FN57_
2. __FN58_
3. __FN59_

Code for answer

0. No diseases	5. Tapeworm infection
1. Cold	6. Eye diseases
2. Respiratory diseases	7. Skin diseases
3. Bacillary dysentery	8. Other-1 (_____)
4. Other diarrhea diseases	9. Other-2 (_____)

II-7 Did family planning worker(s) visit your home before? (Y / N) __FN60__

II-8 Contraceptive method your family use. (choose all you take) ____, ____, ____, ____FN61

Code for answer;
1. Pills
2. Condoms
3. Norplant
4. Depo-Provera (injection)
5. Use of loop / ring
6. Surgical method (vasectomy)
7. Surgical method (tubectomy)
8. Do not use any contraceptive method

II-9 Availability of toilet facility in your house. (Y / N) __FN62_

SECTION III AGRICULTURE

III-1 Total area of your farm

	Privately owned land	Land rented from others	Land leased to others
Khet	_FN63_ ropani	_FN64_ ropani	_FN65_ ropani
Bari	_FN66_ ropani	_FN67_ ropani	_FN68_ ropani

Sample No._____

III-2 Damages to your farm by the following incidence in the past 10 years

Category	Frequency	Area affected (on average)
a. Flood	EN69	EN70 ropani
b. Land slide /gully	EN71	EN72 ropani
c. Top soil erosion	EN73	EN74 ropani

Code for frequency:
1. Only once
2. Occasionally
3. Regularly
4. None

III-3 Cropping pattern and production (excluding crops grown in kitchen garden)

Khet	Crop code	Crop code	Crop code
Cropping pattern-1	EN75	EN76	EN77
Cropping pattern-2	EN78	EN79	EN80
Cropping pattern-3	EN81	EN82	EN83

(please answer for major 4 crops you grow in either wet or dry season)

	Crop 1	Crop 2	Crop 3	Crop 4
a. Name of crops	EN84	EN85	EN86	EN87
b. Planted area	EN88ropani	EN89ropani	EN90ropani	EN91ropani
c. Total production	EN92 kg	EN93 kg	EN94 kg	EN95 kg
d. Production sold	EN96 kg	EN97 kg	EN98 kg	EN99 kg
e. Price at sale	EN100Rs/kg	EN101Rs/kg	EN102Rs/kg	EN103Rs/kg
f. Production given to others (rending, exchanged, etc.)	EN104 kg	EN105 kg	EN106 kg	EN107 kg
g. Chemical fertilizer used	EN108 kg	EN109 kg	EN110 kg	EN111 kg
h. Main crop damage, if any	EN112	EN113	EN114	EN115

Code for crops
1. Rice
2. Wheat
3. Maize
4. Finger millet
5. Buckwheat
6. Barley
7. Potato
8. Mastard (oil seed)
9. Beans
10. Vegetables
11. Other-1 (_____)
12. Other-2 (_____)

Code for damage
1. Drought (water shortage)
2. Diseases
3. Insects
4. Animals (specify _____)
5. Hail stone
6. Wind
7. Land slide / erosion
8. Flood
9. Other (_____)
10. None

Sample No._____

Bari	Crop code	Crop code	Crop code
Cropping pattern-1	EN116	EN117	EN118
Cropping pattern-2	EN119	EN120	EN121
Cropping pattern-3	EN122	EN123	EN124

(please answer for major 4 crops you grown in either wet or dry season)

		Crop 1	Crop 2	Crop 3	Crop 4
a.	Name of crops	EN125	EN126	EN127	EN128
b.	Planted area	EN129ropani	EN130ropani	EN131ropanj	EN132ropani
c.	Total production	EN133_kg	EN134_kg	EN135_kg	EN136_kg
d.	Production sold	EN137_kg	EN138_kg	EN139_kg	EN140_kg
e.	Price at sale	EN141Rs/kg	EN142Rs/kg	EN143Rs/kg	EN144Rs/kg
f.	Production given to others (rending, exchanged, etc.)	EN145_kg	EN146_kg	EN147_kg	EN148_kg
g.	Chemical fertilizer used	EN149_kg	EN150_kg	EN151_kg	EN152_kg
h.	Main crop damage, if any	EN153	EN154	EN155	EN156

SECTION IV LIVESTOCK / ANIMALS

IV-1 Livestock and feed

		Numbers		Dry season		Wet season	
		Young	Adult	Main Feed (select up to 3)	Sufficiency	Main Feed (select up to 3)	Sufficiency
1.	Cows / oxen	EN157	EN158	EN159	EN160	EN161	EN162
2.	Buffalo	EN163	EN164	EN165	EN166	EN167	EN168
3.	Goat	EN169	EN170	EN171	EN172	EN173	EN174
4.	Sheep	EN175	EN176	EN177	EN178	EN179	EN180
5.	Pig	EN181	EN182				
6.	Chicken	EN183	EN184				
7.	Duck	EN185	EN186				
8.	Rabbit	EN187	EN188				
9.	Pigeon	EN189	EN190				

10. Fish (please answer if you grow fish or not) Yes / No EN191

Code for main feed:
1. Grass
2. Tree fodder
3. Crop residue
4. Grain

Code for sufficiency:
1. Sufficient
2. Just enough
3. Short
4. Very short

SECTION V FOREST

V-1 Do you have private forest? (Y / N) EN192

If Yes, EN193____ ropani

V-2 Membership of Community Forest EN194

Code for answer:
1. Member of forest user group
2. Non-member

Sample No._____

V-3 Horticultural trees privately owned

	No. of trees		No. of trees
1. Orange trees	*EN195*	7. Banana	*EN201*
2. Lime trees	*EN196*	8. Leichi trees	*EN202*
3. Lemon trees	*EN197*	9. Guava	*EN203*
4. Mango trees	*EN198*	10. Coffee	*EN204*
5. Papaya trees	*EN199*	11. _____	*EN205*
6. Pear trees	*EN200*	12. _____	*EN206*

V-4 Other trees privately owned and their species name

	No. of trees	Name of species (major 3 species)
1. Fodder tree	*EN207*	(*EN208*)
		(*EN209*)
		(*EN210*)
2. Fuelwood trees	*EN211*	(*EN212*)
		(*EN213*)
		(*EN214*)
3. Timber trees	*EN215*	(*EN216*)
		(*EN217*)
		(*EN218*)
4. Bamboo	*EN219* bunches	

Sample No._____

SURVEY FOR HOUSEHOLD MEMBERS

M D Y

Date: _____/_____/_____*FN1*

Respondent: _____*FN2*_____

Sex (M / F) *FN3* Age: *FN4*

VDC: *FNM3* Ward: *FNM4* Caste: *FNM6*

A Participation / engagement of household members

Home activities	Your participation / engagement (See "Code")	Activities you want to make easy
1. Fetching of drinking water	1__*FN5*	(Choose up to 5 activities with
2. Cooking	2__*FN6*	priority from the ones you
3. Washing	3__*FN7*	checked in the left line (1 - 33))
4. Sweeping the house	4__*FN8*	1st__*FN54*
5. House repair	5__*FN9*	2nd__*FN55*
6. Child / elderly care	6__*FN10*	3rd__*FN56*
7. Kitchen gardening	7__*FN11*	4th__*FN57*
8. Sewing and knitting	8__*FN12*	5th__*FN58*
9. Shopping in bazzar	9__*FN13*	
Farming activities		
10. Plowing	10__*FN14*	
11. Seeding/ transplanting	11__*FN15*	
12. Weeding	12__*FN16*	
13. Transportation of compost	13__*FN17*	
14. Application of compost	14__*FN18*	
15. Application of chemical fertilizers	15__*FN19*	
16. Harvesting	16__*FN20*	
17. Threshing of cereals	17__*FN21*	
18. Milling of cereals	18__*FN22*	
19. Repairing of terrace	19__*FN23*	
20. Selling crops	20__*FN24*	
Livestock raising		
21. Collection of fodder	21__*FN25*	
22. Feeding	22__*FN26*	
23. Watering	23__*FN27*	
24. Milking	24__*FN28*	
25. Grazing control	25__*FN29*	
26. Sweeping of livestock stall	26__*FN30*	
27. Selling dairy products	27__*FN31*	

(to be continued)

Code for answer: 1. Usually 2. Sometimes 3. None

Sample No._____

	Your participation / engagement
Forestry activities	
28. Collection of fuel wood	28__*FN32*
29. Collection of leaf litter	29__*FN33*
30. Timber harvest	30__*FN34*
31. Selling of fuel wood	31__*FN35*
Domestic buisiness	
32. Shop keeping	32__*FN36*
33. Manufacturing of goods	33__*FN37*
Communication	
34. Delivery of message (messenger)	34__*FN38*
35. Attending community meetings	35__*FN39*
36. Resolving in-village conflicts	36__*FN40*
37. Getting information from TV	37__*FN41*
38. Getting information from Radio	38__*FN42*
39. Getting information from Newspaper	39__*FN43*
40. Political discussion with others	40__*FN44*
41. Official letter writing	41__*FN45*
Religious / cultural activities	
42. Dance party	42__*FN46*
43. Picnic	43__*FN47*
44. Festival preparation	44__*FN48*
45. Worship ceremony	45__*FN49*
46. Watching films	46__*FN50*
47. Sport events	47__*FN51*
48. Playing card	48__*FN52*
49. Board games	49__*FN53*

Sample No._____

B Present concerns and collective actions related to them

		Degree of concern	Actions / participation in the past? (Y / N)	External assistance in the past? (Y / N)	Willing to take actions / participation? (Y / N)
1.	Food availability	1 *EN59*	1 *EN60*	1 *EN61*	1 *EN62*
2.	Fodder availability	2 *EN63*	2 *EN64*	2 *EN65*	2 *EN66*
3.	Fuel wood availability	3 *EN67*	3 *EN68*	3 *EN69*	3 *EN70*
4.	Drinking water availability	4 *EN71*	4 *EN72*	4 *EN73*	4 *EN74*
5.	Crop productivity	5 *EN75*	5 *EN76*	5 *EN77*	5 *EN78*
6.	Cash income	6 *EN79*	6 *EN80*	6 *EN81*	6 *EN82*
7.	Motorable roads	7 *EN83*	7 *EN84*	7 *EN85*	7 *EN86*
8.	Foot trails	8 *EN87*	8 *EN88*	8 *EN89*	8 *EN90*
9.	Maintenance of terrace	9 *EN91*	9 *EN92*	9 *EN93*	9 *EN94*
10.	Irrigation	10 *EN95*	10 *EN96*	10 *EN97*	10 *EN98*
11.	Electricity supply	11 *EN99*	11 *EN100*	11 *EN101*	11 *EN102*
12	Communication facility	12 *EN103*	12 *EN104*	12 *EN105*	12 *EN106*
13.	Labor force availability	13 *EN107*	13 *EN108*	13 *EN109*	13 *EN110*
14.	Education of children	14 *EN111*	14 *EN112*	14 *EN113*	14 *EN114*
15.	Education of myself	15 *EN115*	15 *EN116*	15 *EN117*	15 *EN118*
16.	Health	16 *EN119*	16 *EN120*	16 *EN121*	16 *EN122*
17	Family planning	17 *EN123*	17 *EN124*	17 *EN125*	17 *EN126*
18.	Sanitation	18 *EN127*	18 *EN128*	18 *EN129*	18 *EN130*
19.	Land slide & soil erosion	19 *EN131*	19 *EN132*	19 *EN133*	19 *EN134*
20.	Flood	20 *EN135*	20 *EN136*	20 *EN137*	20 *EN138*
21.	Forest resources	21 *EN139*	21 *EN140*	21 *EN141*	21 *EN142*
22.	Dance party	22 *EN143*	22 *EN144*	22 *EN145*	22 *EN146*
23.	Festival	23 *EN147*	23 *EN148*	23 *EN149*	23 *EN150*
24.	Worship of gods	24 *EN151*	24 *EN152*	24 *EN153*	24 *EN154*
25.	Political discussion	25 *EN155*	25 *EN156*	25 *EN157*	25 *EN158*
26.	Meeting on com. development	26 *EN159*	26 *EN160*	26 *EN161*	26 *EN162*
27.	Watching movies	27 *EN163*	27 *EN164*	27 *EN165*	27 *EN166*
28.	Security	28 *EN167*	28 *EN168*	28 *EN169*	28 *EN170*

Code for degree of concerns:

1. Strongly concerned
2. Concerned
3. Slightly concerned
4. Not concerned
5. No answer

Sample No._____

C. Importance of forest and measures to improve it.

Importance (Choose up to 5 items)		Measures / ideas to improve it (Choose the most appropriate one)
1. *EN171*	->	1. *EN172*
2. *EN173*	->	2. *EN174*
3. *EN175*	->	3. *EN176*
4. *EN177*	->	4. *EN178*
5. *EN179*	->	5. *EN180*

Code for importance

0. No answer
1. Source of fuel wood
2. Source of fodder
3. Source of leaf litter
4. Source of timber
5. Source of medicinal plants
6. Source of food (fruits, etc.)
7. Hunting sites
8. Function to conserve soils
9. Function to conserve water
10 Other-1 ( )
11 Other-2 ( )

Code for measures to improve:

0. No answer
1. Tree planting in private land
2. Tree planting in community forests
3. Protection of forest
4. Use biogas as an energy source
5. Use improved stove to reduce fuel wood consumption
6. Use gas cylinder as an energy source
7. Use kerosine as an energy source
8. Other1 (specify_____)
9. Other2 (specify_____)
10. Other3 (specify_____)

D. ***(This question is only for those who answered "concern" or "strongly concern" about land slide in Question B-19.)***

What do you think could be done so as to prevent and/or stop expansion of land slide ?

(Choose up to 3 items in order of importance)

1. *EN181*
2. *EN182*
3. *EN183*

Code for answer

0. Not applicable or no answer
1. Tree planting in and upstream of land slide site
2. Construction of check dam(s)
3. Control the use of land slide-prone area
4. Construction of drainage ditches
5. Other1 (please specify : _____)
6. Other2 (please specify : _____)

Sample No._____

E. ***(This question is only for those who answered "concern" or "strongly concern" about maintenance of terrace in Question B-9.)***

What do you think could be done so as to reduce destruction of terrace ?

(*Choose up to 3 items in order of importance*)

1. *EN184*
2. *EN185*
3. *EN186*

Code for answer

0. Not applicable or no answer
1. Tree planting in the upstream of farm land
2. Regular maintenance of damaged terrace
3. Construction of drainage ditches
4. Other1 (please specify : _____)
5. Other2 (please specify : _____)
6. Other3 (please specify : _____)

Appendix Table 7-3 VDC/Ward Development Profile (Example)

Parbat North Model Area

VDC/WARD
DEVELOPMENT PROFILE

OF

KATUWA CHAUPARI VDC

VDC / WARD PROFILE

District:Parbat, VDC-1 - Kauwa chaupari

VDC / WARD PROFILE

District:Parbat, VDC-1 - Katuwa chaupari

	Unit	Ward-1	Ward-2	Ward-3	Ward-4	Ward-5	Ward-6	Ward-7	Ward-8	Ward-9	Total
0. Data Sources		Refer List of interviewees/keyinformants of the model area									
Date of Survey (M/D/Y)	M/D/Y										
Interviewee(s)	Name	1									
		2									
		3									
1. Area and Location		See , page 9 of 9									
1.1 Settlement(s) (Village)	Name	1 Sal Bichhouna	Chapaiphat	Katuwa Choupari	Hatia	Sauhar	Subedichour	Adhikarithar	Parajulithar	Damaithar	
		2 Badhare	Powdelchour	Bharati khor	Lampate	Adhikari thar	Lamichhanethar	Devpuja	Antighar	Dandaghar	
		3 Majhigaon	Kujebichhouna	Dewlibari		Banskhanne			Subedithar	Tarkmelithar	
		4							Sailipakha	Kalimati	
1.2 Distance to :	hours	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	Foot / Bus	
Pokhara	(one way)	1 / 3	2 / 3	2 / 3	1.5 / 3	2 / 3	2 / 3	2 / 3	1 / 3	2 / 3	
Kusma		1 /	1 /	1.5 /	1.5 /	1.5 /	1.5 /	1.5 /	1 /	1 /	
Waling		1 / 6	1 / 6	1.5 / 6	1.5 / 6	1.5 / 6	1.5 / 6	1.5 / 6	1 / 6	1 / 6	
Syangja		1 / 5	1 / 5	1.5 / 5	1.5 / 5	1.5 / 5	1.5 / 5	1.5 / 5	1 / 5	1 / 5	
1.3 Land use											
a. Agricultural Land	Hectare	22.5	17.5	25	20	17.5	20	22.5	16	10	171
Khet	Hectare	17.5	12.5	17.5	12.5	10	12.5	15	8.5	0	106
Bari	Hectare	5	5	7.5	7.5	7.5	7.5	7.5	7.5	10	65
b. Forest land	Hectare	For location of community forests, see, page 9 of 9									
Com. forest (Formal)	Hectare	2	4.5	0	0	0	0	0	0	0	6.5
Com. forest (IF)	Hectare	7	0	0	0	0	0	0	5	5	17
Private forest	Hectare	1	0	0	10	3	4.5	0	0	15	33.5
Other forest	Hectare	0	0	0	0	0	0	0	0	0	0
c. Grazing land	Hectare	0.75	0	0	0	0	0	0	0	1.25	2
d. Settlement	Hectare	5	6	2.5	4	6	7.5	7.5	6	10	54.5
e. Others	Hectare	0	0	0	0	0	0	0	0	0	0
2. Demography											
2.1 Household											
a. Total H.	nos.	43	55	29	42	37	33	40	38	45	362
b. Woman headed H	nos.	16	21	10	15	14	12	15	11	19	133
2.2 Ethnic groups											
a. Brahman	H.hold	33	49	25	31	17	31	40	36	35	297
b. Chhetri	H.hold	10	2	4	4	8	0	0	0	0	28
c. Damai	H.hold	0	0	0	0	10	0	0	0	7	17
d. Gurung	H.hold	0	0	0	0	0	0	0	0	0	0
e. Jogi	H.hold	0	0	0	0	0	0	0	0	0	0
f. Kami	H.hold	0	0	0	6	2	0	0	2	3	13
g. Kunwar	H.hold	0	0	0	0	0	0	0	0	0	0
h. Magar	H.hold	0	0	0	0	0	0	0	0	0	0
i. Newar	H.hold	0	1	0	0	0	0	0	0	0	1
j. Sarki	H.hold	0	3	0	0	0	2	0	0	0	5
k. Other 1 (Sunar)	H.hold	0	0	0	1	0	0	0	0	0	1
l. Other 2	H.hold	0	0	0	0	0	0	0	0	0	0
m. Other 3	H.hold	0	0	0	0	0	0	0	0	0	0

VDC / WARD PROFILE

District:Parbat, VDC-1 - Katuwa chaupari

	Unit	Ward-1	Ward-2	Ward-3	Ward-4	Ward-5	Ward-6	Ward-7	Ward-8	Ward-9	Total
2.3 Population											
a. Male	persons	112	110	75	113	120	75	120	80	80	885
b. Female	persons	116	143	79	100	142	77	136	106	85	984
c. Total	persons	228	253	154	213	262	152	256	186	165	1869
2.4 Age distribution											
5 yrs	persons	25	28	17	23	29	17	28	21	18	206
6 and 15 yrs	persons	41	45	28	38	47	27	46	33	30	335
16 and 24 yrs	persons	55	61	37	51	63	36	61	45	40	449
25 and 44 yrs	persons	64	71	43	60	73	43	72	52	46	524
45 and 59 yrs	persons	27	30	18	26	32	18	31	22	20	224
60 yrs	persons	16	18	11	15	18	11	18	13	11	131
2.5 Education level											
a. University Male	persons	3	3	5	5	5		2	2	3	28
Female	persons				3	4					7
b. College Male	persons	3	3	3	3	4	2	6	5	2	31
Female	persons	2	2	2	2	2	3	3	2	2	20
c. S.L.C. passe Male	persons	10	7	10	10	5	5	5	7	5	64
Female	persons	7	5	7	7	4	2	3	3	3	41
2.6 Occupation											
a. Carpenter	persons		3		15	4	5	3	5	7	42
b. Black Smith	persons				7	3			5	3	18
c. Tailor	persons					10				5	15
d. Bamboo Work	persons										
e. Other handicraft	persons										
f. Mason (Brick Layer)	persons			10	15	7			5	15	52
g. Teachers	persons		7	6	5	3		2	3	1	27
h. Porters	persons				10	15	4	4	6	15	54
i. Work in foreign	persons	6	6	3	14	5	3	5	4	2	48
j. Driver	persons										
k. Civil servent	persons										
2.7 Out migration											
Total of the last 5 yrs	Household	1	1				1				3
2.8 Major destinations		1 Pipaltari	1 Chitwan	1	1	1	1 Chitwan	1	1	1	1
		2	2	2	2	2	2	2	2	2	2
		3	3	3	3	3	3	3	3	3	3
2.9 In migration											
Total of the last 5 yrs	Household	1									
2.10 Major origins		1 Pipaltari	1	1	1	1	1	1	1	1	1
		2	2	2	2	2	2	2	2	2	2
		3	3	3	3	3	3	3	3	3	3

VDC / WARD PROFILE

District:Parbat, VDC-1 - Katuwa chaupari

	Unit	Ward-1	Ward-2	Ward-3	Ward-4	Ward-5	Ward-6	Ward-7	Ward-8	Ward-9	Total
3. Community organizations											
a. Mothers' club	(Y/N)	Y	Y	Y	Y		Y	Y	Y	Y	8
b. Farmers' group	(Y/N)	Y		Y							2
c. Youth club	(Y/N)				Y	Y			Y		3
d. 4-H club	(Y/N)										
e. Ethnic organization	(Y/N)										
f. Users' Group (Non-For.)	(Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
g. Others	(Y/N)										
4. Public facilities		For location, see attached , page 9 of 9									
a. School											
Primary School	Class	1 (1-3)									1
Secondary School	Class										
High School	Class			1 (1-10)							1
Campus	nos.										
b. Health facilities											
Hospital	nos.										
H. post/center	nos.										
Pharmacy	nos.										
c. Post office	(Y/N)			Y							1
d. Telephone											
e. No. of shops	nos.	2	2	3	2	3	2	1	2	2	19
f. Police station	(Y/N)										
g. Bank	(Y/N)										
h. Drinking water	(Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
i. Elec. supply	(Y/N)										
5. Agriculture/Livestock											
a. Major cropping pattern		See "Major Cropping Pattern" attached , page 8 of 9									
b. Crops sold to outside	Name	1	1 Potato	1 Vegetable	1	1 Paddy	1	1	1 Potato	1 Mustard	1
	Name	2 None	2	2 Black gram	2 None	2 Wheat	2 None	2 None	2	2 Black gram	2
	Name	3	3	3	3	3 Maize	3	3	3	3	3
c. Food (cereals,veg)	Name	1	1	1 Paddy	1 Paddy	1 Paddy	1 Paddy	1 Paddy	1 Paddy	1 Paddy	1
insufficient in the	Name	2 None	2 None	2	2 Wheat	2 Wheat	2	2	2 Wheat	2 Wheat	2
village	Name	3	3	3	3 Vegetable	3	3	3	3 Maize	3 Maize	3
d. Livestock raised	Name	1 Cow	1 Cow	1 Cow	1 Cow	1 Cow	1 Cow	1 Cow	1 Cow	1 Cow	1
	Name	2	2	2	2	2	2	2	2	2	2
	Name	3	3	3	3	3	3	3	3	3	3
	Name	4	4	4	4	4	4	4	4	4	4
e. Horticultural crops	Name	1 None	1 None	1 None	1 None	1 None	1 None	1 Lichi	1 None	1 None	1 None
sold to outside	Name	2	2	2	2	2	2	2	2	2	2
	Name	3	3	3	3	3	3	3	3	3	3

VDC / WARD PROFILE

District:Parbat, VDC-1 - Katuwa chaupari

	Unit	Ward-1	Ward-2	Ward-3	Ward-4	Ward-5	Ward-6	Ward-7	Ward-8	Ward-9	Total
6. Forest											
a. Community forests	(Y/N)										
		For the details of community forest, see "Profile of Community Forest" attached, page 6 of 9									
b. Forest products sold Timber, Fuel wood	Name 1										
	Name 2	None	None	None	None	None	None	None	None	None	
	Name 3										
7. Cottage Industries											
a. No. of H.H. Involved											
Rice mill	H.holds	1		1	1		1		1		5
Other mill	H.holds										
Other food processing	H.holds										
Wood processing	H.holds										
Bamboo work	H.holds										
Poultry farming	H.holds		2	3	4	3	4	1			17
Others	H.holds										
8. Natural Disaster in the	(Y/N)										
past 10 years		See "Profile of Natural Disaster" attached, page 7 of 9									
									Y	Y	2

PROFILE OF DEVELOPMENT PROJECTS

District: Parbat, VDC- Katuwa Chaupari

VDC	Ward(s) Involved	Project Category	Project Status	Project Feature (Including No. of Beneficiaries)	Fund	Wage rate in VDC (Rs)		Beneficiaries' Contribution (Yes/No)	Users' group (Yes/No)
						Male	Female		
Katuwa Chaupari	1-9	1	1 1990	Provide drinking water facility 345 households (60 taps)	1	S 100 U 40	U 40	Yes	Yes
Katuwa Chaupari	2-8	2	1 1978	Provide Irrigation facility 450 households	1	WP	WP	Yes	Yes
Katuwa Chaupari	1-9	1	1 1989	All people of VDC, (52 taps)	1	WP	WP	No	Yes
Katuwa Chaupari	2-8	2	1 1986		1	WP	WP	No	Yes

S=Skilled, WP = Wage Paid as per prevailing rates. U = Unskilled

Code:

Project Category

1 Drinking water
2 Irrigation
3 Agriculture
5 Reforestation
4 Foot trails
6 Motorable roads
7 Check dam
8 Bridge
9 Power supply
10 Communication (Post, telephone)
11 Toilet construction
12 Health facility
13 School
14 Family planning
15 Nutritional improvement
16 Cattage industry
17 Other (specify)

Project Status

1 Completed (year in completion)
2 On-going (year to be completed)
3 Planned (Year expected to start)

Fund

1 Public agencies
2 NGO
3 Others (Specify)

PROFILE OF COMMUNITY FOREST

District: Parbat, VDC- Katuwa Chaupari

Location (VDC)	Status	Ward(s) Covered by Forest	Ward(s) That use Forest	Area (Hectare)	No.of User Households	Dominant Tree Species	Usage of Forest	Management	
								Watchman (Yes/No)	Rules (Yes/No)
Katuwa Chaupari	3	9	9	5	120	1. Salla 2. Shishau 3. Chilaune 4. Katus	1,2,3	Yes	1)No 2) 3) 4)
Katuwa Chaupari	2	8	8,9	5	46	1. Salla 2. Shishau	1,2,3	Yes	1) Yes 2) Yes 3) Yes 4) Yes
Katuwa Chaupari	1	1,2	2	6.5	58	1. Salla 2. Khayar 3. Chilaune 4. Katus	1,2,3	Yes	1) Yes 2) Yes 3) Yes 4) Yes
Katuwa Chaupari	2	1	1	7	50	1. Salla 2. Shishau 3. Katus	1,2,3	Yes	1) Yes 2) Yes 3) Yes 4) Yes
									1) 2) 3) 4) 5)
									1) 2) 3) 4) 5)
									1) 2) 3) 4) 5)

Code:

Status
- 1 Formal (recognized by DFO)
- 2 Under processing for application or approval
- 3 Informal

Usage of Forest
- 1 Mainly for fuelwood collection
- 2 mainly for fodder and leaf litter collection
- 3 Mainly for timber
- 4 Others (Specify)

Rules:
- 1 Boundary rules (whether it has a fixed boundary or not)
- 2 Input rules (type and amount of resources required by each user to contribute to the user group activities
- 3 Harvesting rules (how the benefits are shared by users)
- 4 Penalty rules (to punish the rule breakers)

NATURAL DISASTERS IN THE PAST

District: Parbat, VDC- Katuwa Chauperi

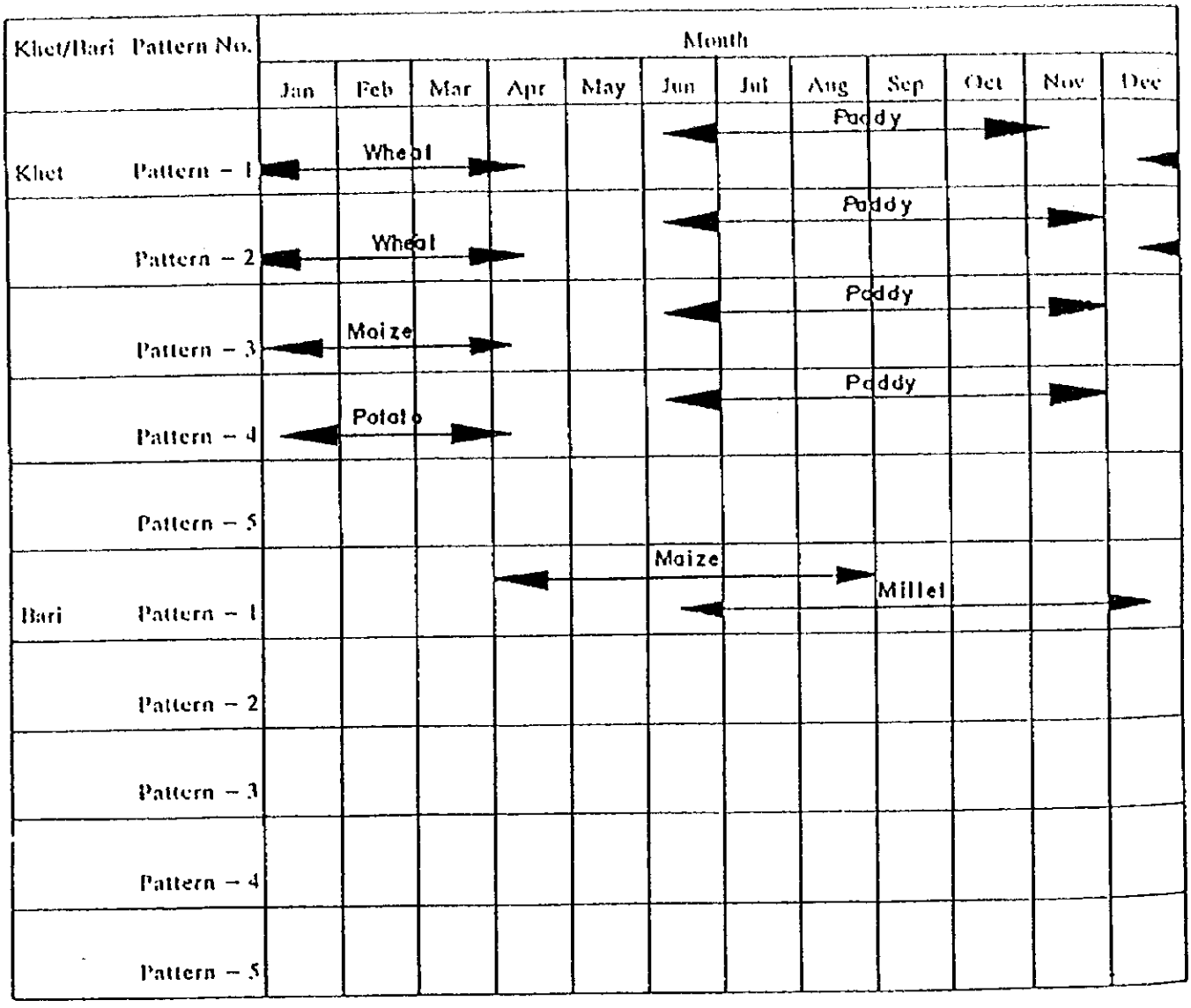
Location		Type of Disaster	Year/month occurred (Chiristian era)	Damages			Counter measure(s)	
VDC name	Ward No.			Casualty	Property		Proposed Measures	Implementation (Yes/No)
					Private	Public		
Katuwa Chauperi	8	2	1994	Killed	House			
					Livestock		No	
				Injured				
					Farm land			
						0.5 ha		
Katuwa Chauperi	9	2	1994	Killed	House			
					Livestock		No	
				Injured				
					Farm land			
						0.25 ha		
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			
				Killed	House			
					Livestock			
				Injured				
					Farm land			

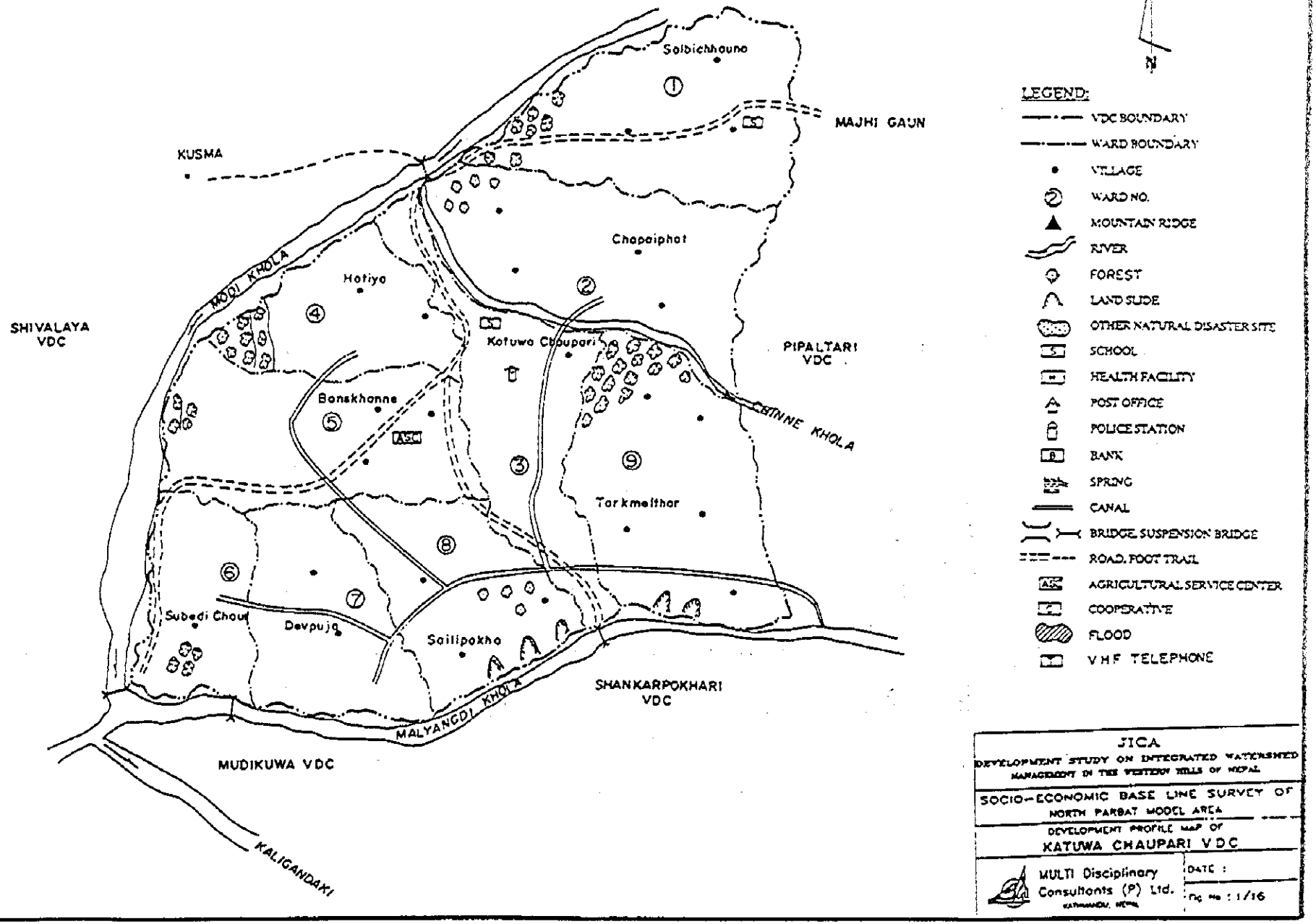
Code: **Type of disasters:**

1 Flood
2 Land slide
3 Forest fire
4 Other (soil erosion)

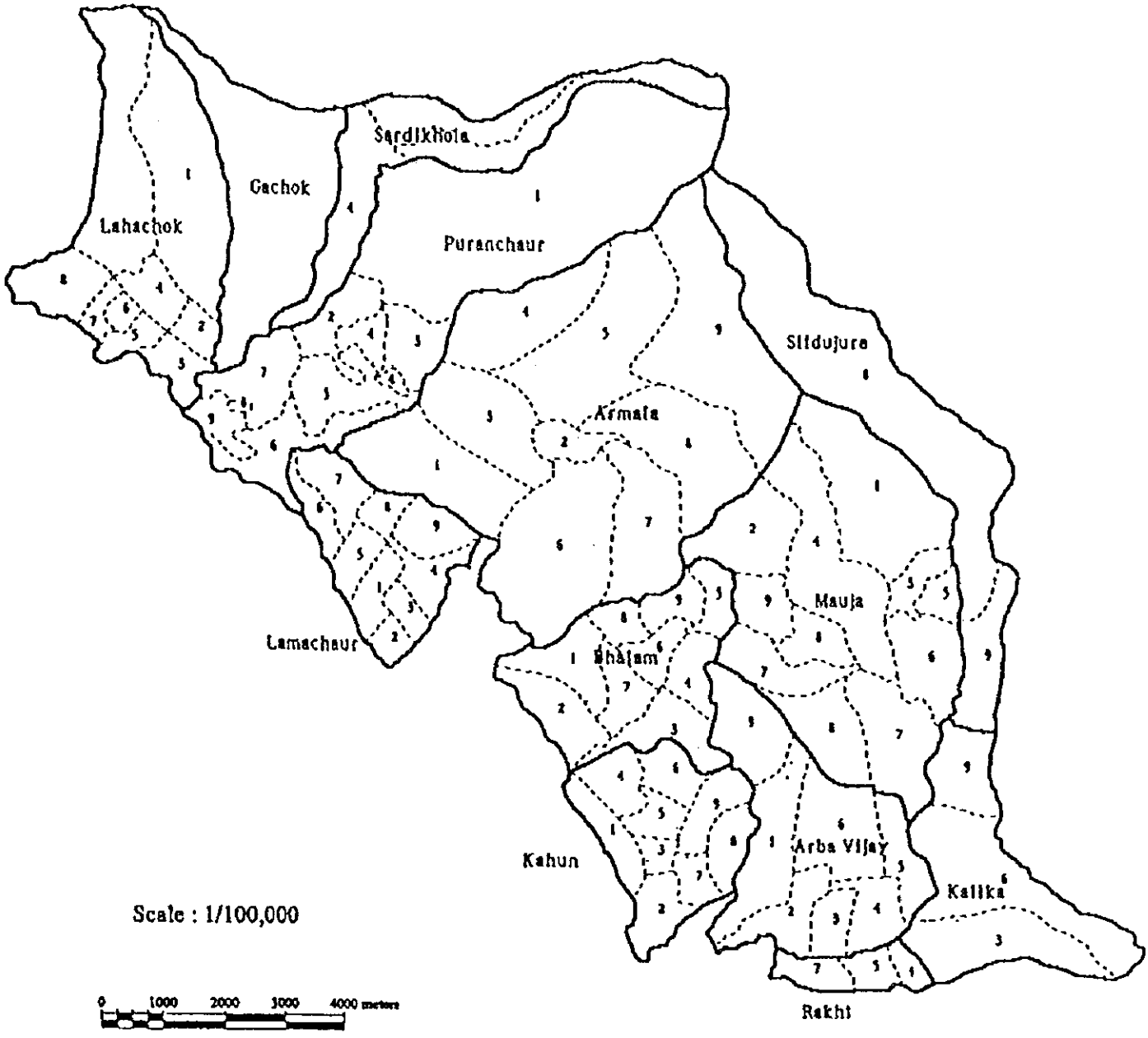
CROPPING PATTERN
PARBAT DISTRICT
KATUWA CHAUPARI VDC

FIG. 1



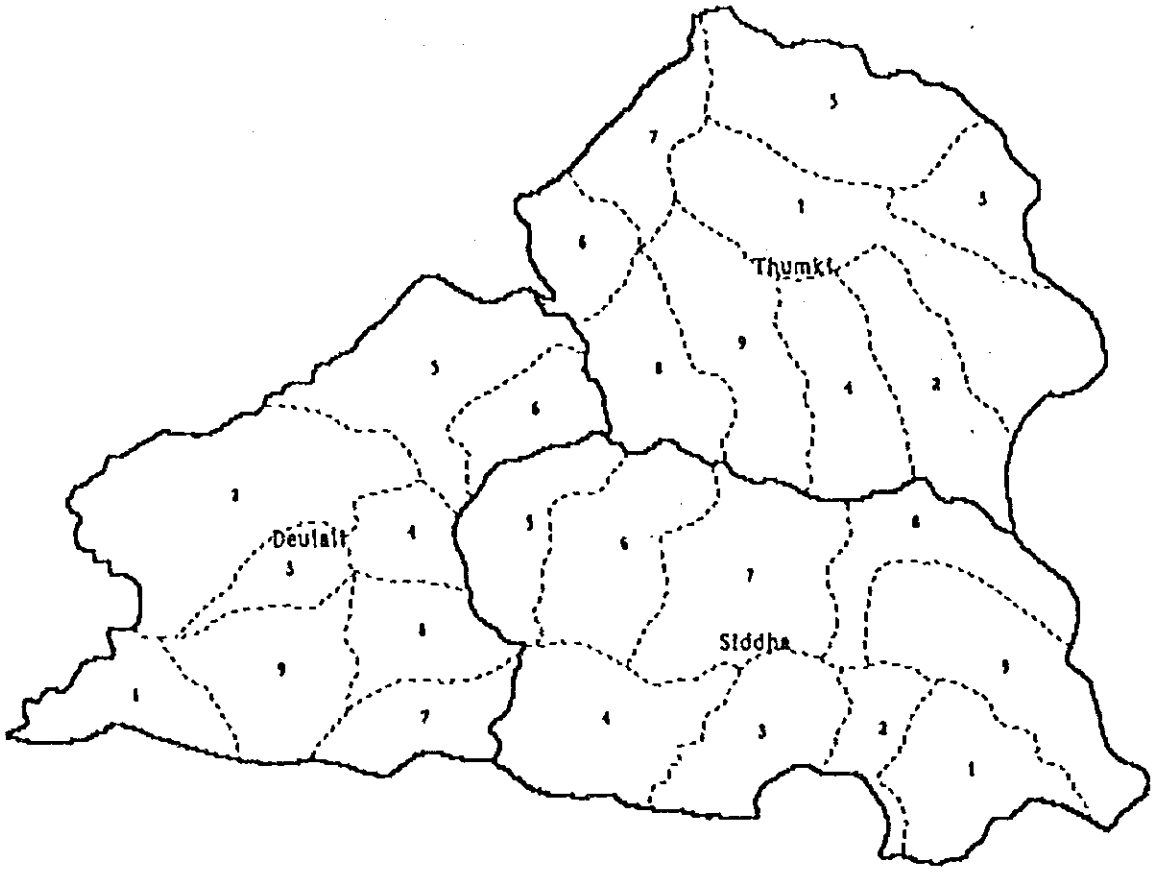

Solbichhauno
MAJHI GAUN
KUSMA
Chapaiphat
Hotiya
MODI KHOLA
SHIVALAYA VDC
Kotuwa Chaupari
PIPALTARI VDC
Bonskhanne
ASC
CHINNE KHOLA
Tarkmelthar
Subedi Chour
Devpuja
Sallipokho
SHANKARPOKHARI VDC
MALYANGDI KHOLA
MUDIKUWA VDC
KALIGANDAKI
N
LEGEND:
VDC BOUNDARY
WARD BOUNDARY
VILLAGE
WARD NO.
MOUNTAIN RIDGE
RIVER
FOREST
LAND SLIDE
OTHER NATURAL DISASTER SITE
SCHOOL
HEALTH FACILITY
POST OFFICE
POLICE STATION
BANK
SPRING
CANAL
BRIDGE, SUSPENSION BRIDGE
ROAD, FOOT TRAIL
AGRICULTURAL SERVICE CENTER
COOPERATIVE
FLOOD
V H F TELEPHONE
JICA
DEVELOPMENT STUDY ON INTEGRATED WATERSHED MANAGEMENT IN THE WESTERN HILLS OF NEPAL
SOCIO-ECONOMIC BASE LINE SURVEY OF NORTH PARBAT MODEL AREA
DEVELOPMENT PROFILE MAP OF
KATUWA CHAUPARI V D C
MULTI Disciplinary Consultants (P) Ltd.
KATHMANDU, NEPAL
DATE :
Fig no : 1/16

WARD MAPS



Kaski North Model Area

Fig. 7-4 Ward Maps



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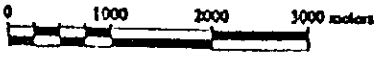
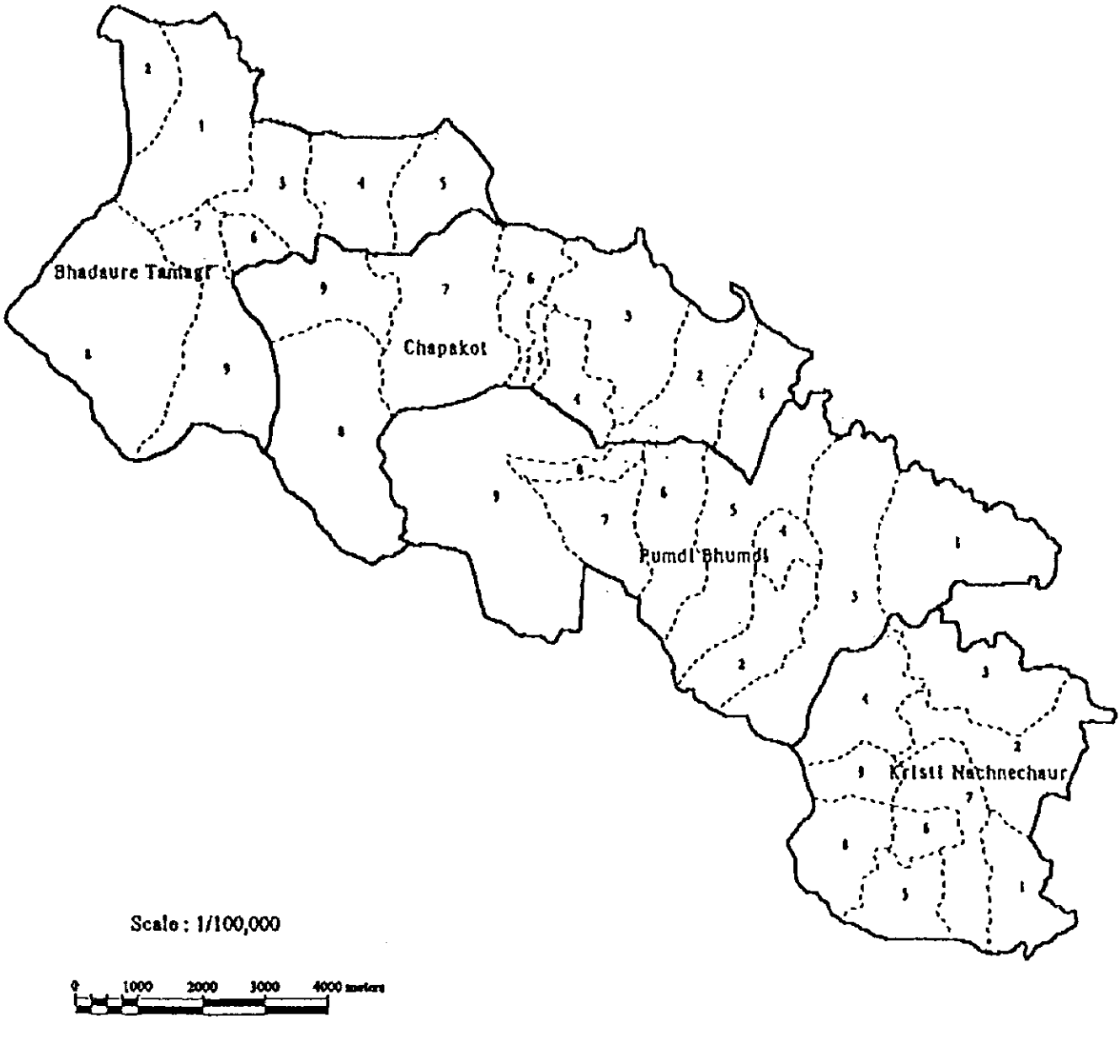
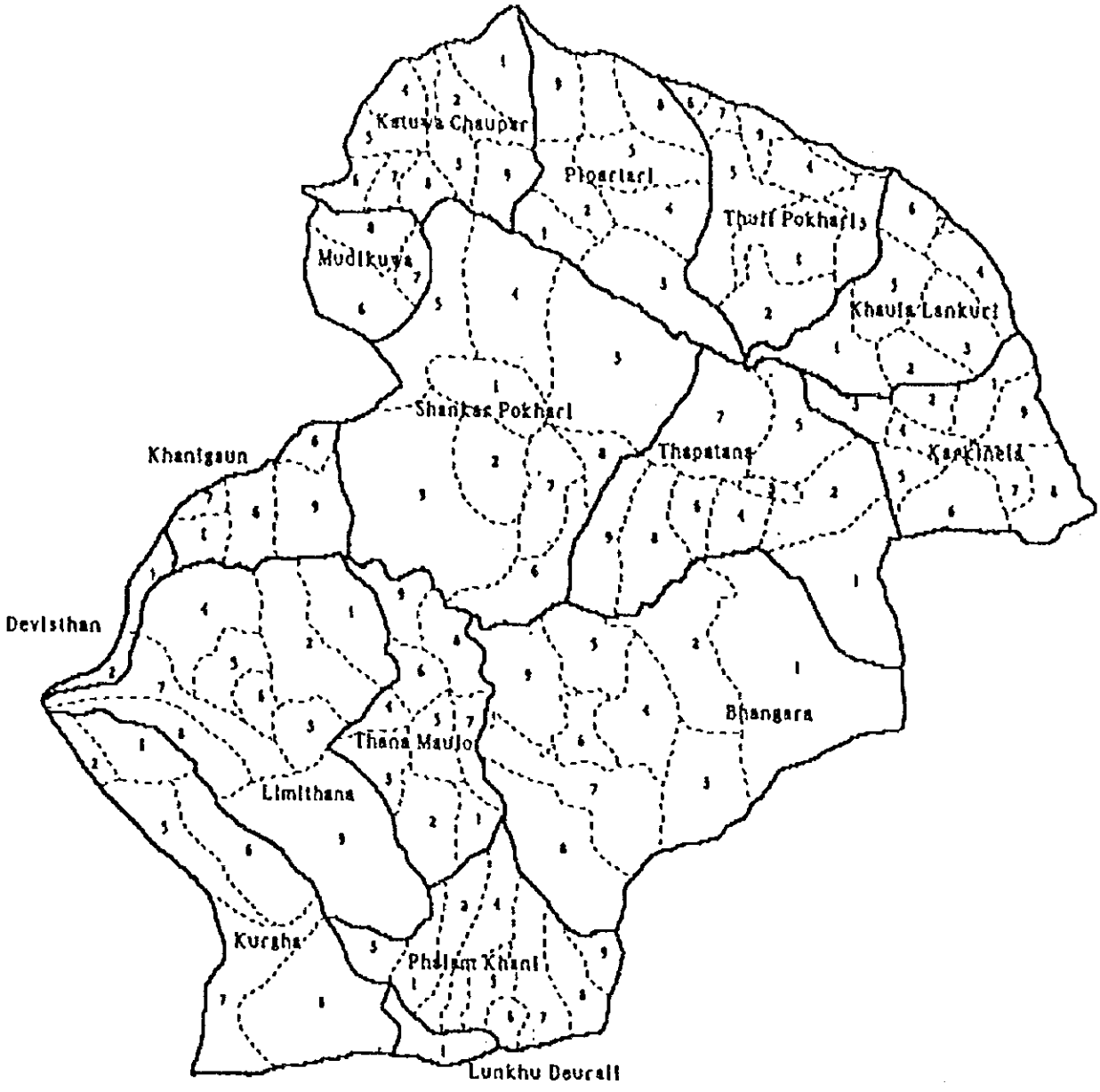


Kaski East Model Area

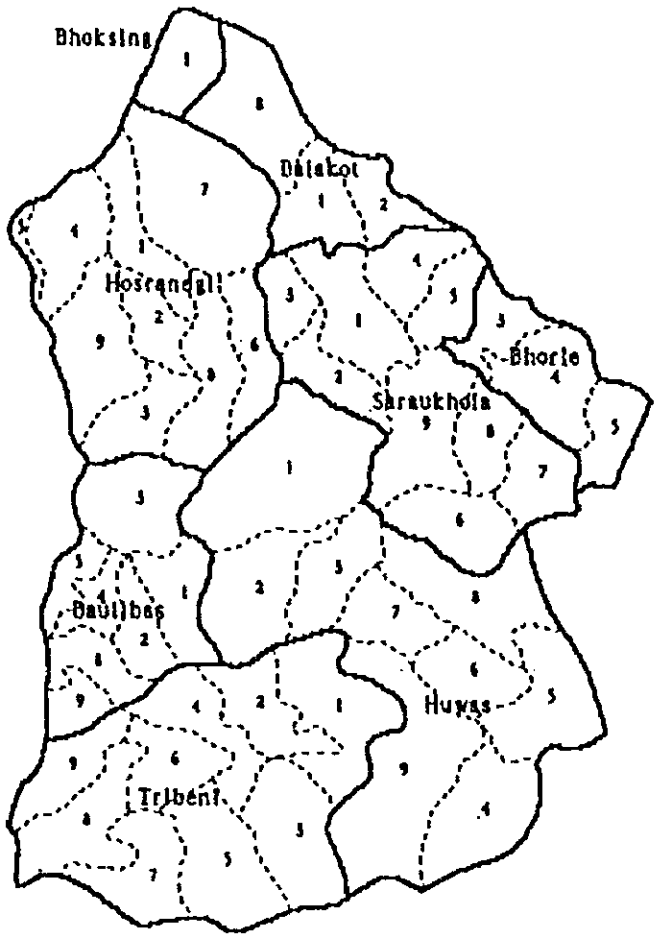


Kaski West Model Area



Scale : 1/75,000

Parbat North Model Area



Scale : 1/75,000

Parbat South Model Area

Appendix Table 7-5 List of GIS Outputs (Socioeconomic Survey)

(1/3)

Item	Model Area	Scale
<Topography>		
Elevation Classification	Parbat N.	1/75,000
Elevation Classification	Parbat S.	1/75,000
Elevation Classification	Kaski E.	1/75,000
Elevation Classification	Kaski N.	1/100,000
Elevation Classification	Kaski W.	1/100,000
Elevation Classification	5 Model Areas	1/200,000
<Administrative Boundary>		
VDC Name and Ward No.	Parbat N.	1/75,000
VDC Name and Ward No.	Parbat S.	1/75,000
VDC Name and Ward No.	Kaski E.	1/75,000
VDC Name and Ward No.	Kaski N.	1/100,000
VDC Name and Ward No.	Kaski W.	1/100,000
Ward No.	5 Model Areas	1/200,000
<Land Use>		
Current Land Use (Forest)	5 Model Areas	1/200,000
Current Land Use (Forest/Farmland)	"	"
<Ward Characteristics>		
A-1 : Population density	5 Model Areas	1,200,000
A-2 : Ratio of occupational castes	"	"
A-3 : Ratio of households of which farmland has suffered from flooding (any time of the year)	"	"
A-4 : Ratio of households of which farmland has suffered from landslides (any time of the year)	"	"
A-5 : Ratio of households of which farmland has suffered from soil erosion (any time of the year)	"	"
A-6 : Level of interest in terrace preservation (score)	"	"
A-7 : Level of interest in landslides/soil erosion (score)	"	"
A-8 : Level of interest in firewood (score)	"	"
A-9 : Level of interest in general forest resources (score)	"	"
A-10 : Walking time to nearest vehicle road	"	"
A-11 : Livestock units per ha	"	"
A-12 : Area of farmland per capita	"	"
A-13 : Ratio of absentees	"	"
A-14 : Ratio of people with no formal education	"	"
A-15 : Ratio of organizational membership	"	"
A-16 : Ratio of households with extreme shortage of drinking water (dry season)	"	"
A-17 : Ratio of households with extreme shortage of firewood	"	"
A-18 : Firewood consumption per capita	"	"
A-19 : Distance to nearest firewood forest (single journey time)	"	"
A-20 : Ratio of households with shortage of grain held for own consumption	"	"
A-21 : Average number of months per year in which grain held for own consumption is inadequate	"	"
A-22 : Ratio of households with a toilet	"	"
A-23 : Ratio of households with extreme shortage of animal feed (dry season)	"	"
A-24 : Ratio of households possessing private forest	"	"
A-25 : Ratio of households which are members of a community forest	"	"

(2/3)

Item	Model Area	Scale
B-1 : Need for reduced burden of water fetching work (women)	5 Model Areas	1/200,000
B-2 : Need for reduced burden of cooking (women)	"	"
B-3 : Need for reduced burden of shopping (men)	"	"
B-4 : Need for reduced burden of ploughing work (men)	"	"
B-5 : Need for reduced burden of compost transportation work (women)	"	"
B-6 : Need for reduced burden of grain threshing work (women)	"	"
B-7 : Need for reduced burden of flour milling and rice polishing work (women)	"	"
B-8 : Need for reduced burden of terrace repair work (men)	"	"
B-9 : Need for reduced burden of feed collection work (women)	"	"
B-10: Need for reduced burden of firewood collection work (women)	"	"
C-1 : Level of interest in sufficient food supply (men and women)	5 Model Areas	1/200,000
C-2 : Level of interest in sufficient animal feed supply (men and women)	"	"
C-3 : Level of interest in sufficient firewood supply (men and women)	"	"
C-4 : Level of interest in sufficient drinking water supply (men and women)	"	"
C-5 : Level of interest in crop productivity (men and women)	"	"
C-6 : Level of interest in cash income (men and women)	"	"
C-7 : Level of interest in vehicle roads (men and women)	"	"
C-8 : Level of interest in footpaths (men and women)	"	"
C-9 : (Not prepared due to duplication with A-9)	"	"
C-10 : Level of interest in irrigation (men and women)	"	"
C-11 : Level of interest in electricity supply (men and women)	"	"
C-12 : Level of interest in telecommunications (telephone service) (men and women)	"	"
C-13 : Level of interest in labour shortage (men and women)	"	"
C-14 : Level of interest in children's education (men and women)	"	"
C-15 : Level of interest in self-education (men and women)	"	"
C-16 : Level of interest in health (men and women)	"	"
C-17 : Level of interest in family planning (men and women)	"	"
C-18 : Level of interest in sanitation (men and women)	"	"
C-19 : (Not prepared due to duplication with A-6)	"	"
C-20 : (Not prepared due to duplication with A-6)	"	"
C-21 : (Not prepared due to duplication with A-6)	"	"
C-22 : Level of interest in religion (men and women)	"	"
C-23 : Level of interest in meetings on village development (men and women)	"	"
D-1 : Ratio of households using biogas	5 Model Areas	1/200,000
D-2 : Ratio of households headed by a woman	"	"
D-3 : Total number of privately owned trees per household	"	"
D-4 : Number of privately owned fodder trees per household	"	"
D-5 : Number of privately owned firewood trees per household	"	"
D-6 : Number of privately owned timber trees per household	"	"
D-7 : Number of privately owned fruit trees per household	"	"
D-8 : Average yield of paddy rice in Khet	"	"
D-9 : Average yield of wheat in Khet	"	"
D-10 : Average yield of maize in Bari	"	"
D-11 : Average yield of millet in Bari	"	"
D-12 : Average annual planting ratio in Khet	"	"
D-13 : Average annual planting ratio in Bari	"	"

(3/4)

Item	Model Area	Scale
E-1 : Experience of joint work regarding "fodder"	5 Model Areas	1/200,000
E-2 : Experience of joint work regarding "firewood"	"	"
E-3 : Experience of joint work regarding "landslides"	"	"
E-4 : Experience of joint work regarding "flood control"	"	"
E-5 : Experience of joint work regarding "maintenance and conservation of forest resources"	"	"
E-6 : Experience of joint work regarding "maintenance and repair of terraces"	"	"
E-7 : Experience of joint work regarding "footpaths"	"	"
E-8 : Experience of joint work regarding "drinking water"	"	"
E-9 : Experience of participation in "community meetings"	"	"
E-10 : Experience of outside support regarding "fodder"	"	"
E-11 : Experience of outside support regarding "firewood"	"	"
E-12 : Experience of outside support regarding "landslides"	"	"
E-13 : Experience of outside support regarding "flood control"	"	"
E-14 : Experience of outside support regarding "maintenance and conservation of forest resources"	"	"
E-15 : Experience of outside support regarding "maintenance and repair of terraces"	"	"
E-16 : Experience of outside support regarding "footpaths"	"	"
E-17 : Experience of outside support regarding "drinking water"	"	"
E-18 : Experience of outside support regarding "community meetings"	"	"
F-1 : Level of interest in sufficient food supply	5 Model Areas	1/200,000
F-2 : Level of interest in sufficient drinking water supply	"	"
F-3 : Level of interest in crop productivity	"	"
F-4 : Level of interest in sufficient drinking water suppply	"	"
F-5 : Level of interest in crop productivity	"	"
F-6 : Level of interest in cash income	"	"
F-7 : Level of interest in road	"	"
F-8 : Level of interest in trail	"	"
F-9 : Level of interest in terrace maintenance	"	"
F-10 : Level of interest in irrigation	"	"
F-11 : Level of interest in electricity supply	"	"
F-12 : Level of interest in telecommunication	"	"
F-13 : Level of interest in labour shortage	"	"
F-14 : Level of interest in childre's education	"	"
F-15 : Level of interest in self education	"	"
F-16 : Level of interest in health	"	"
F-17 : Not prepared	"	"
F-18 : Not prepared	"	"
F-19 : Level of concern on landslide and erosion	"	"
F-20 : Level of concern on flooding	"	"
F-21 : Level of interest in forest resources (overall)	"	"
F-22 : Level of interest in religion	"	"
F-23 : Level of interest in meetings on village development	"	"

(4/4)

Item	Model Area	Scale
G-1 : Reduced burden of water fetching (women)	5 Model Areas	1/200,000
G-2 : Reduced burden of water cooking (women)	"	"
G-3 : Reduced burden of shopping (men)	"	"
G-4 : Reduced burden of plowing (men)	"	"
G-5 : Reduced burden of compost transportation (women)	"	"
G-6 : Reduced burden of grain threshing (women)	"	"
G-7 : Reduced burden of flour milling (women)	"	"
G-8 : Reduced burden of terrace repair (men)	"	"
G-9 : Reduced burden of feed collection (women)	"	"
G-10 : Reduced burden of firewood collection (women)	"	"

APPENDIX 8 EROSION CONTROL AND HAZARD PREDICTION

8-1 Some of the Existing Hazard Maps and Handbooks

8-1-1 Department of Soil Conservation (DOSC)

(1) Erosion Status Maps

Information from land use maps and land system maps (based on geology, slope, soil, drainage, etc.) prepared by Land Resources Mapping Project (LRMP) and information on population density had been used to formulate erosion status maps. Erosion status maps showing areas of low, medium and high erosion status are available for both Kaski and Parbat Districts at the Scale 1/125,000. Data from the maps are used for prioritization of sub-watersheds in a district in terms of implementation of soil conservation measures.

(2) Landslide Hazard Mapping Handbook

The handbook was compiled to be used as "a guideline for preparing landslide hazard maps showing the potential landslide intensities in an area". The landslide factors considered are land use, land system and slope. land use and land system maps are from the same source as mentioned in the erosion status maps. Slope maps are prepared using topographic maps of the Scale 1/50,000. Maps showing the distribution of existing landslides are also prepared. The (weightage) rating such as 1 or 2, etc., is assigned to each class of a factor on the basis of the density of existing landslides in that particular class. A combined map is prepared by overlaying the 3 maps (land use, land system, slope). Each mapping unit displays 3 figures (one figure for each factor) and these figures are multiplied to obtain the combined value for a unit. The total commulative value is divided into 5 levels, each showing the probability of landslide occurrence such as very low, low, moderate, high and very high on the map.

8-1-2 International Centre for Integrated Mountain Development (ICIMOD)

The Mountain Risk Engineering Handbook (Part I and II) was published by ICIMOD in 1991 for training and application purposes. It consists of 26 chapters. Chapter 14 provides concepts of hazards and risks for the prediction of landslides from the existing conditions of the materials and processes, and assessment of likely damage to

infrastructure, especially roads, by landslides. Approach to hazard and risk assessment for road is proposed in a project cycle consisting of prefeasibility stage, feasibility stage, and detailed survey and design stage.

Chapter 22 gives preliminary hazard and risk assessment at prefeasibility stage for mountain roads. Slope maps, engineering geological maps, hydrological maps and the like are prepared to assess hazard factors. Ratings are assigned to each hazard factor based on subjective judgment and are adjusted whenever more information is available. The maps are digitized and each factor's rating is written in nodes (meshes) of either 2mm x 2mm or 4mm × 4mm on topographic maps of the scale 1/25,000. The choice of mesh size depends on the accuracy desired. The rating values are cumulated on each node of the studied zone and the total rating values are divided into hazard probability classes, for both soil and rock, as low, medium, high and very high.

8-1-3 Water Induced Disaster Prevention Technical Centre (DPTC)

(1) A Flood Hazard Map of Bagmati River in Terai was prepared covering the Sarlahi and Rautahat Districts in the downstream areas of the Bagmati River which were affected by 1993 flood disaster. The map was prepared by conducting field investigation and interviewing local inhabitants. It shows water depths of < 0.5m, 0.5m-2.0m and > 2.0m.

(2) Hazard Mapping Based on the Few Case Studies in the Central Region of Nepal (Seminar Papers Theme E, ISWID, 1996)

A landslide distribution map, a specific hazard map showing zones of landslide hazard, flood hazard and bebris flow hazard as well as a hazard map showing low, medium and high rock and soil hazard zones were prepared for the Kamala River watershed in central Nepal mainly through aerial photo interpretation and field observation. The factors assessed for the preparation of the hazard maps are lithology (degree of rock hardness), hydrology(dry, seepage, permanent spring), land use (forest, dry cultivated land, wet cultivated land and barren land), soil type and depth, etc. The rating for the hazard maps basically follows the methodology as mentioned in Mountain Risk Engineering Handbook, ICIMOD, 1991.

8-2 Preparation Method of Erosion Hazard Maps

8-2-1 Preparation of hazard factor maps

According to the UNDRO 1991 Manual on Mitigating Natural Disasters "The basic parameters for landslide hazard assessment include landslide distribution, geological data (lithology), geomorphological data (slope angle, etc.), hydrological data (specially groundwater), seismicity, etc." In Model Areas, in addition to the above mentioned parameters, humen action, mainly in the form of land use practices, as mentioned at the beginning of this report, also plays an important role in occurrence of landslides and other forms of mass movement. Land use, therefore, was included as a parameter in assessing erosion hazard.

Maps of those geological factors, soil factors and geomorphological factors that were found to have close relationships with mass movement occurrence in the area were prepared for each Model Area by geological survey team and the details are given in III-2 Geological Survey of the Progress Report. Maps showing land use categories closely related to mass movement hazard were prepared using the information from Land Use and Vegetation Maps as mentioned in III-4 Land Use and Vegetation Survey of the Progress Report. Slope maps were prepared on the basis of the classification standards of DOSC.

"In general the most important cause of landslide is groundwater, which is supplied from infiltrated rainwater or snow. When the soil mass is saturated, groundwater increases the pore water pressure" (FAO Conservation Guide 13/4). "Groundwater can wash out soluble cementing substances and thus weaken the integranular bonds and reduce the mechanical strength of the ground. Flowing groundwater flushes out fine particles in fine sand and silt and the strength of the slope is reduced by cavities formed in the process (Zarub and Mencle 1982: in Landslide Studies and Management in Nepal, ICIMOD, 1996). Therefore, groundwater was included as a hydrological factor for the assessment of hazard, and maps, showing the location and influence zones vis-a-vis landslide occurrence of some of the permanent springs as well as seepage zones, were prepared. Information on the location of the springs and seepage zones was collected from landform maps of the geological survey report and during field inspection.

As for as the rainfall factor is concerned, generally landslides are said to be caused by concentrated (intense) short term (24 hours) rainfalls. Usually when concentrated

rainfall exceeds a certain amount (threshold), for example 100mm, in an area, the landslides start occurring. The threshold value for landslide occurrence in that particular area, therefore, is the rainfall of around 100mm. Threshold values vis-a-vis landslide occurrence for Study Area and for Nepal as a whole are unknown. However, in Darjeeling, India, which is located near the eastern Nepal "shallow slides or slumps on steep slopes are reported to began occurring when 24 hours rainfall events exceeded 130mm-150mm, or on occasions of continuous rain over a 3 day period in excess of 200mm-240mm" (Landslide Studies and Management in Nepal, ICIMOD, 1996). The condition of rainfall, on the other hand, in the Study Area is as mentioned below:

Area	Annual Rainfall (mm)	Probability of Daily Rainfall With a Return Period of 10 years (mm)
Kaski District	2,500 - 4,500	233-258 (3 stations)
Parbat District	2,000 - 4,000	156 (2 stations)

Source: CDFWCP Watershed Management Short Term Expert report of April, 1996

Both the actual daily rainfall (150mm-163mm for Parbat District and 215mm-277mm for Kaski District between 1981-1990: III-1 Progress Report) and its probability of occurrence in 10 years period are high in Kaski District in comparison to Parbat District. This can suggest that the slope condition in the Kaski District may have adjusted to some extent to this high rainfall, and that some of the most unstable sections of the slope there may have already slided as a result of the rainfall. In terms of the relationship between rainfall and landslide hazard in the area, it's highly likely that a high amount of concentrated rainfall in 24 hours will be more hazardous in Parbat than in Kaski Model Areas. However, only through studies and research it will be possible to clarify this relationship in concrete terms and to find out the threshold value vis-a-vis landslide occurrence in the area.

8-2-2 Rating

Ratings were assigned to each category of a factor depending on whether the category is acting positively (preventing instability) or negatively (creating failure). The ratings are subjective and are based on field knowledge of the surveyor or expert. This method of rating was developed for hazard assessment in the Hindukush and Himalaya region by Deoja, et al, as mentioned in Mountain Risk Engineering Handbook, ICIMOD, 1991. All the above mentioned hazard related factors, their categories and ratings are given in Appendix Table 8-1.

Appendix Table 8-1 Erosion Hazard Related Factors and Ratings

Geological characteristics for hazard assessment

Factor	Category	Rating
A. Rock type		
Soil (Factors C and D)	a. Absent (Soil)	0.0
Massive Quartzite, Dolomite, Limestone, Marble	b. Very hard	0.0
Massive Gneiss, Meta-Sandstone	c. Hard	1.0
Phyllite and Slate	d. Moderately hard	1.5
Schist	e. Weak	2.0
Alternate rock intercalated with weak layers	f. Very weak	2.5
B. Weak zone		
	a. Absent (Soil)	0.0
	b. Non-sheared zone	0.0
	c. Slightly sheared zone	1.5
	d. Moderately sheared zone	2.0
	e. Fault and strongly sheared zone	2.5

Soil characteristics for hazard assessment

Factor	Category	Rating
C. Consolidation of overburden		
	a. Absent	0.0
	b. Semi-consolidated	1.0
	c. Unconsolidated	2.0
D. Thickness of overburden		
	a. T≤1m	0.0
	b. 1m<T≤3m	2.5
	c. 3m<T≤6m	2.0
	d. 6m<T	1.5

Geomorphological characteristics for hazard assessment

Factor	Category	Rating
E. Dip slope		
	a. Absent	0.0
	b. Present but indistinct	1.0
	c. Present and distinct	2.0
F. Erosion front		
	a. Absent	0.0
	b. Present but indistinct	2.0
	c. Present and distinct	4.0

Land use categories characteristics for hazard assessment

Factor	Category	Rating
G. Land use		
Forest	a. Dense cover, reduced run-off, deep root (crown density 40-70% & >70%)	0.0
	b. Moderate cover, reduced run-off deep root (crown density <40%)	0.5
Khet land	c. Managed drainage, reduced run-off	1.0
Shrub land	d. Moderate cover, shallow root	1.5
Bari land	e. Poorly managed drainage, high run-off, bare surface	2.5
Grassland	f. Highly degraded, bare surface, high run-off	3.5

Slope class characteristics for hazard assessment

Factor	Category	Rating
H. Slope (%)		
0≤S<3	a. Flat to nearly flat	0.0
3≤S<15	b. Gentle	0.5
15≤S<30	c. Moderately steep	1.5
30≤S<60	d. Steep	3.0
60≤S	e. Very steep	4.0

Hydrological characteristics for hazard assessment

Factor	Category	Rating
I. Hydrology (groundwater)		
	a. Dry	0.0
	b. Wet (Seepage)	1.5
	c. Permanent spring (flowing)	1.0

8-2-3 GIS overlay

All the hazard factor maps (Scale 1/25,000) were digitized and meshes of 1mm x 1mm was established on them. The digitized maps were overlain and the ratings for categories of factors were added in each mesh for determination of the level of hazard. Several trial and error-type-excersises were conducted with landslide distribution maps and surveyor's knowledge of the field as references, and finally the following levels of hazard were determined.

Hazard level	Rating
Low	0-70
Medium	71-109
High	>109

Erosion hazard level by land use type is as shown in Table 4-7 of Volume I, main text.

8-2-4 Verification

(1) Landslide distribution maps

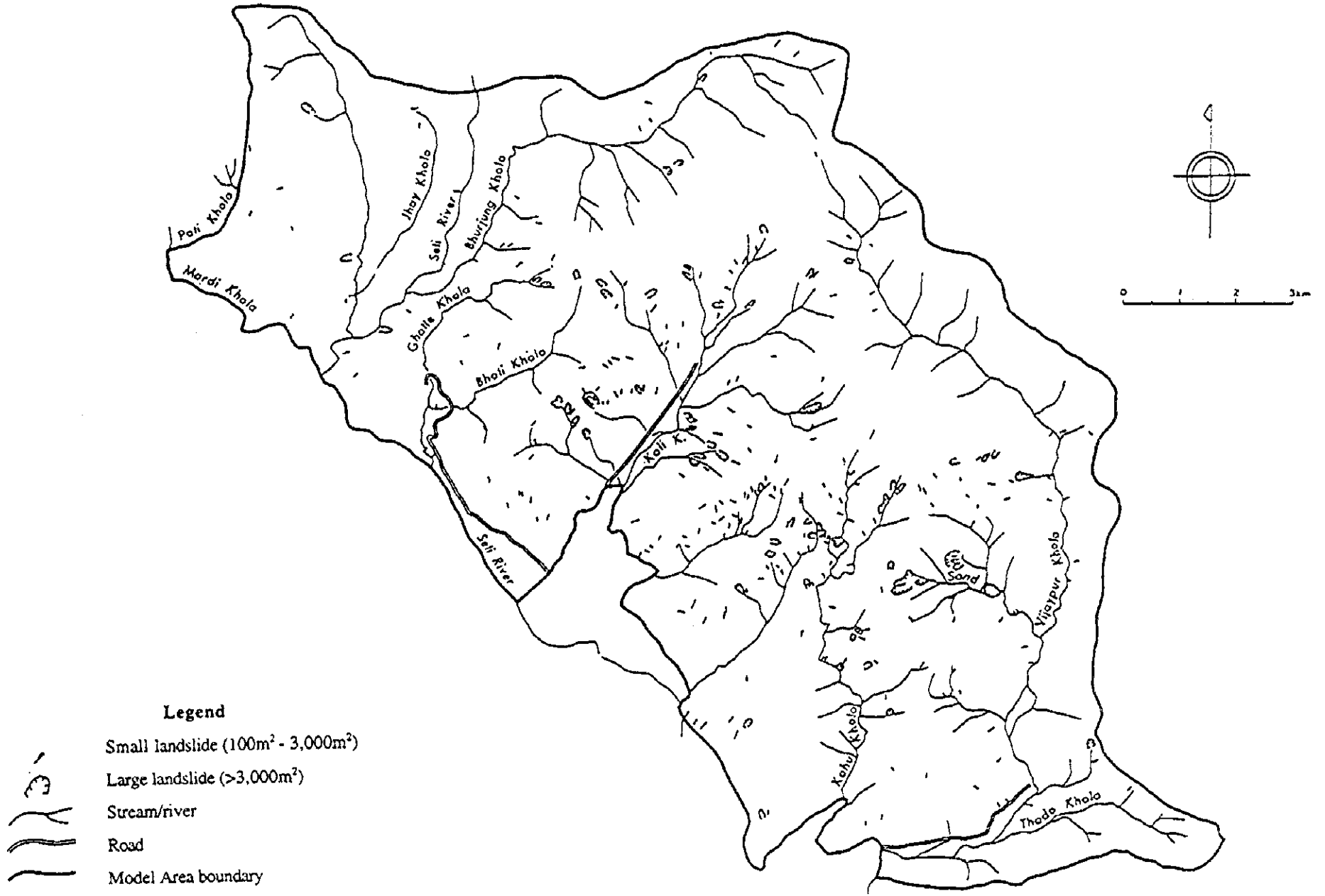
The landslide distribution map from each Model Area was overlain on the same area's draft erosion hazard map to check whether most of the landslides are within the medium and high hazard zones or not. It was found out that close to 80% of the landslides were in the medium and high hazard zones of the tentative hazard maps of Model Areas.

(2) Field verification

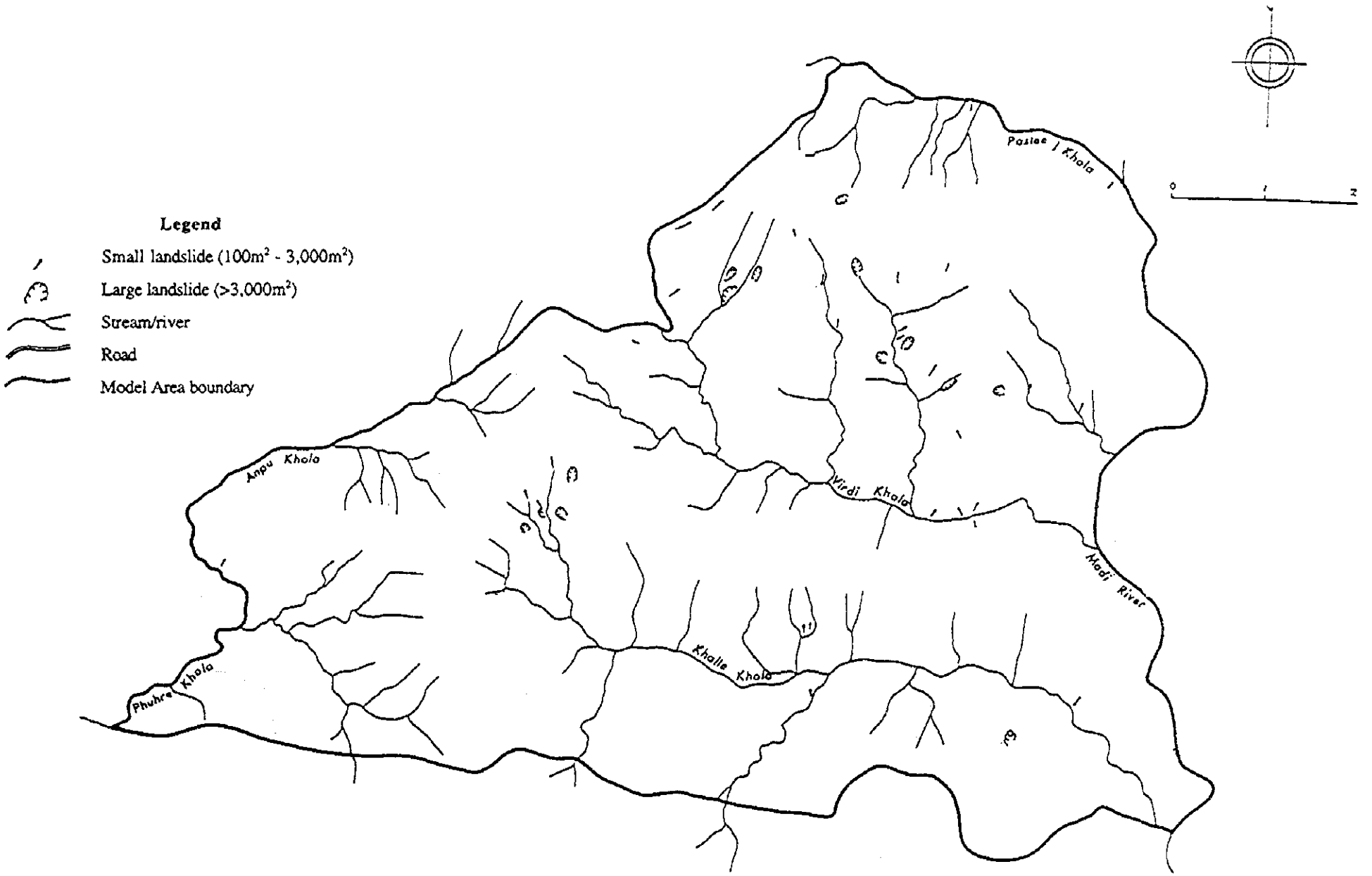
Tentative hazard maps were spot-checked in the field in Model Areas. During the field verification, the same sites that were shown as medium or high hazard zones were also judged by field observation as having medium or high hazard probability due to the presence of new landslides, tension cracks, highly weathered rocks, bare and severely eroded surfaces and active gullies. For example, both right and left side slopes along Mardi Khola in the south-east of Parbat South Model Area appear as medium or high hazard zones on the tentative hazard map. During the field verification it was found out that some 12 new small and medium size landslides had occurred on the same slopes at the end of the 1996 monsoon season. In some cases, however, when the hazard level shown on the hazard maps did not coincide with the field condition, subjective judgment made at the site was considered to be valid and the rating for the most related factor had to be changed accordingly.

8-3 Use of the Erosion Hazard Maps

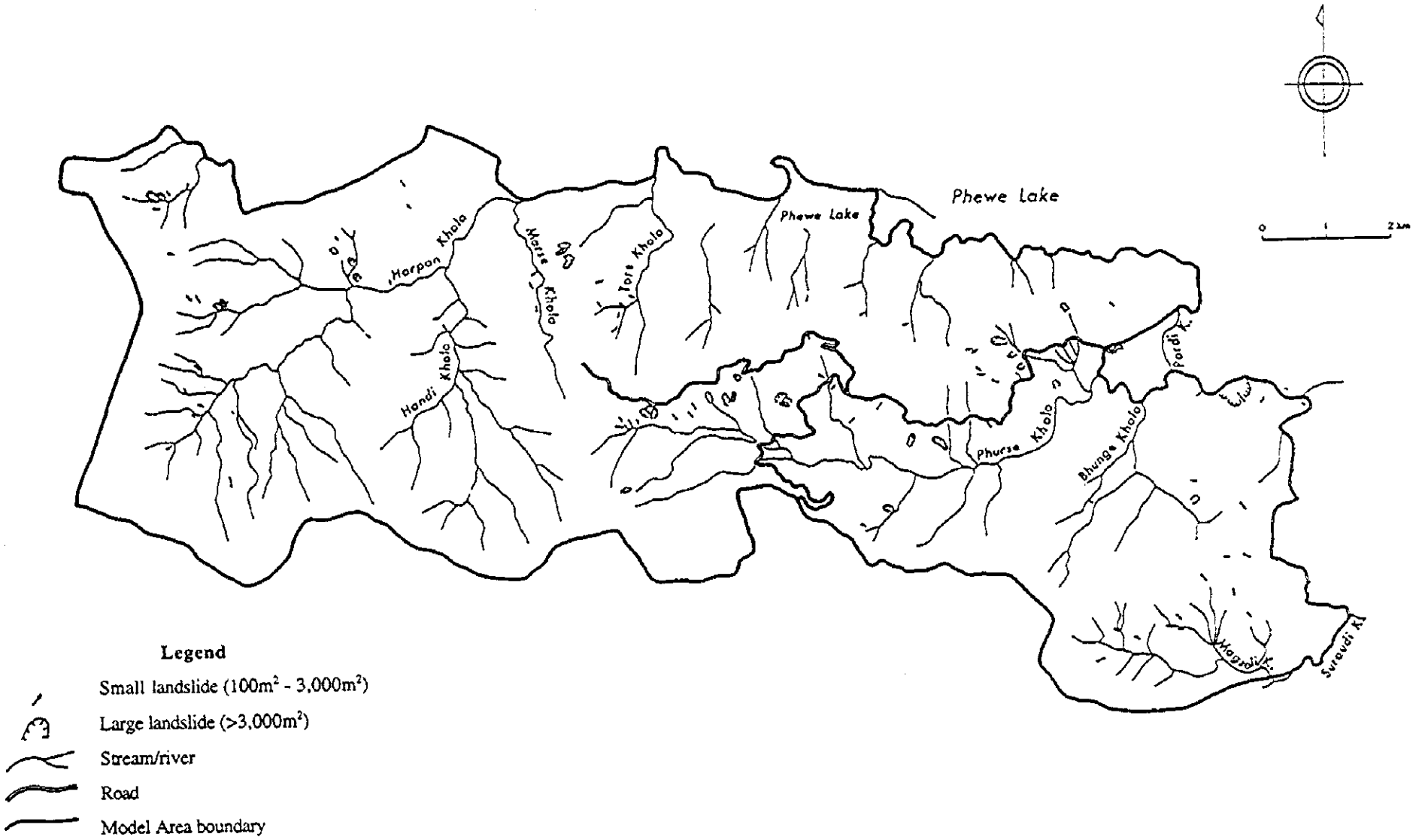
The prepared erosion hazard maps indicate the level and the potential of the occurrence of small as well as large size soil and rock type landslides in Model Areas. The maps are not intended for use in evacuation, chosing of centers for refuge, etc. during disasters, which will require the compilation of more large scale hazard maps based on detailed surveys. In the context of erosion control and infrastructure improvement, the proposed use of the maps for planning countermeasures for hazard mitigation purposes is shown in Appendix Table 8-2.



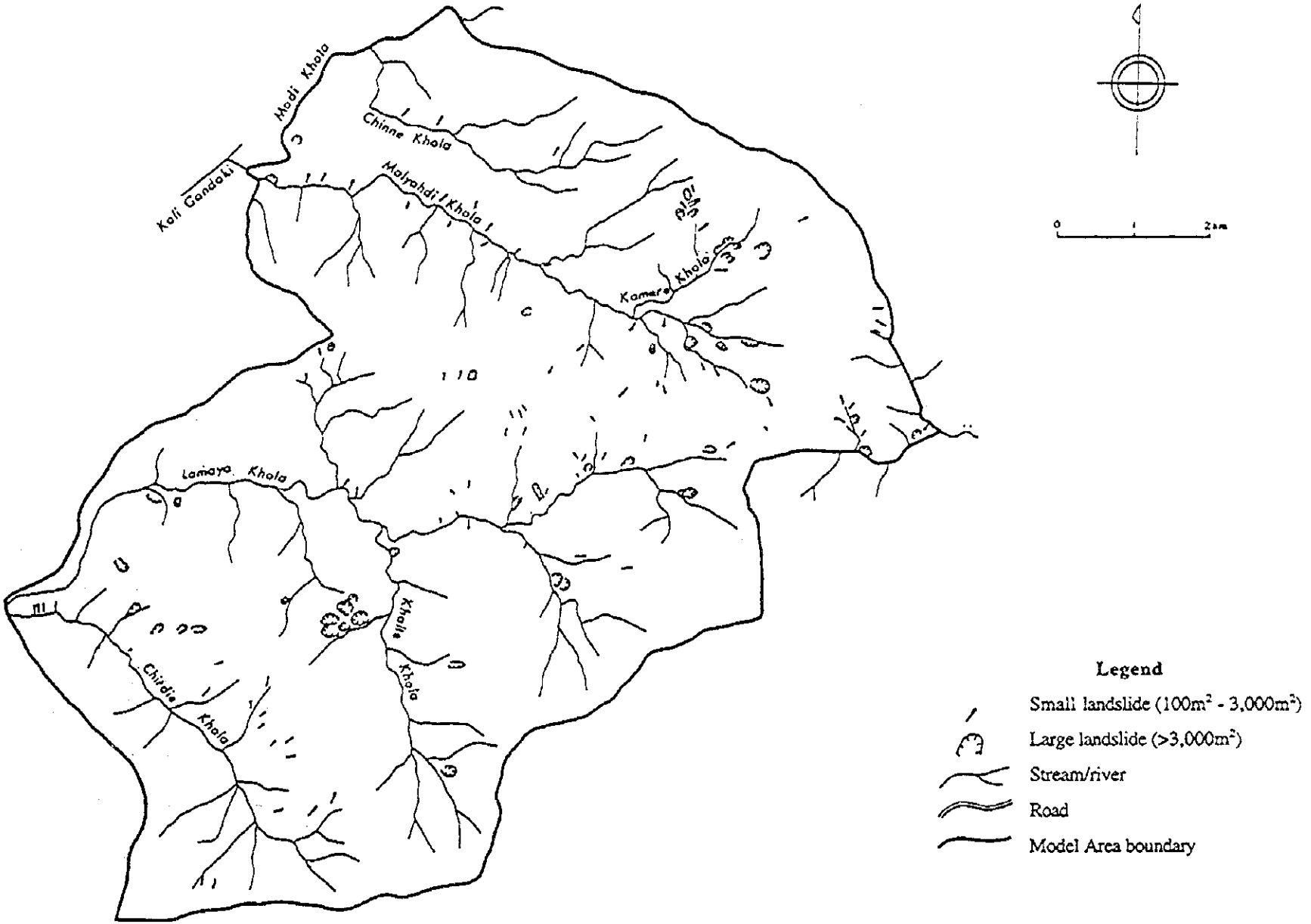
Appendix Fig. 8-1 Landslide Distribution Map – Kaski North Model Area



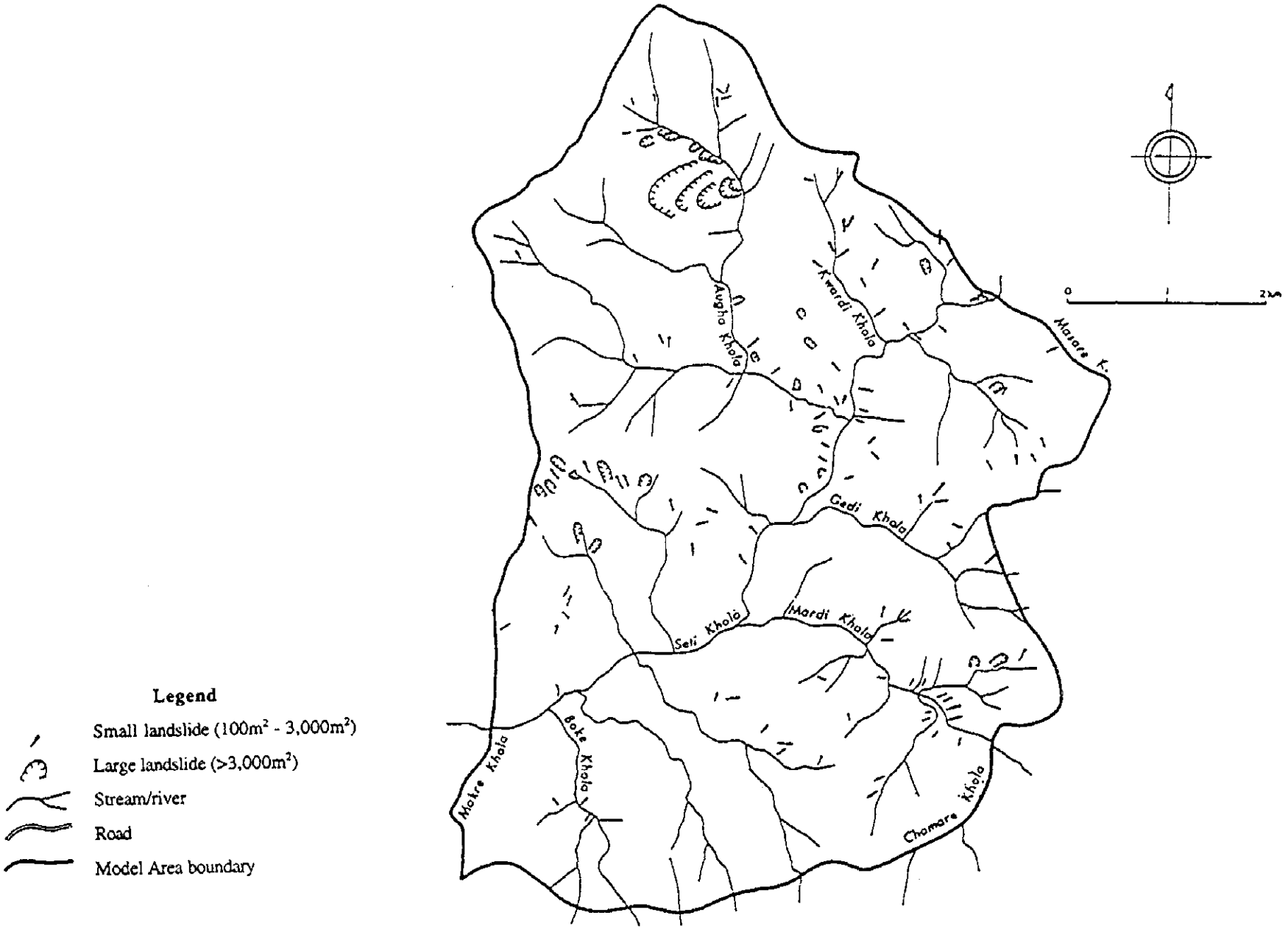
Appendix Fig. 8-2 Landslide Distribution Map – Kaski East Model Area



Appendix Fig. 8-3 Landslide Distribution Map – Kaski West Model Area



Appendix Fig. 8-4 Landslide Distribution Map – Parbat North Model Area



Appendix Fig. 8-5 Landslide Distribution Map – Parbat South Model Area

Appendix Table 8-2 Proposed Countermeasures for Hazard Mitigation in Model Areas

(1/2)

Hazard Level	Land Use and Infrastructure							
	Forest	Overgrazed and degraded grassland	Bari land	Khet land	Irrigation canal	Pond	Trail	Road
High	- Prohibition of clear cutting and selective cutting; - Utilization for fodder and fuelwood under community forest management plan. - Establishment of understorey vegetation and improvement of crown density by encouraging natural regeneration through protection against grazing and fire (community forest management)	- Conversion to forest (using tree species that can be utilized by local inhabitants). - Utilization under a user's group management plan.	- Change to protection zone when located on large landslides. - Terrace improvement: ① by reinforcement of terrace riser by stones (when available). ② by planting of grasses and trees on the riser and terrace edge. ③ by mulching during pre-monsoon and monsoon seasons. - Waterway construction to safely drain the surface run-off	- Basically continuation of the present practice of repairing the terraces by farmers before the on-set of the monsoon season and safe draining of rain water.	- Avoid construction of new canals. - If construction can't be avoided, building canals using concrete and conducting regular maintenance and repairs. - Reinforcement and repairing of existing canals to prevent seepage.	- Avoid the construction of new ponds specially if tension cracks, and subsidence exist in nearby slopes. - For existing ponds: ① improvement through repairing the inner walls using stones and cement (wet masonry). ② increasing the hight of the present walls to prevent overflow during the monsoon.	- Re-routing of existing trails, especially those passing through large landslides; - Provision of drainage facilities and strict observance of construction standards;	- Alignment of new roads should be avoided if possible. - If alignment can't be avoided: ① provision of proper drainage facilities ② immediate stabilization of cut and fill slope through application of bioengineering methods. ③ completion of construction and stabilization works before the start of the monsoon season.

Hazard Level	Land Use and Infrastructure							
	Forest	Overgrazed and degraded grassland	Bari land	Khet land	Irrigation canal	Pond	Trail	Road
Medium	-Selective cutting & utilization of fodder and fuelwood under community forest management plan. - Protection against grazing and fire to promote natural regeneration.	- Practicing silvipastoral (mix planting of trees and grasses) and allowing grazing under a management plan prepared by user's group.	- Terrace improvement by: ① planting of grasses, shrubs and trees on the riser and terrace edge. ② Mulching. ③ Waterway construction to drain surface run-off safely.	- Same as above	- Construction of canals by using stone and cement. - Regular maintenance. -Reinfercement and repair of the existing canals to prevent seepage.	-Construction of ponds by using stone and cement and sufficient height of the walls.	- Provision of drainage facilities and strict observance of construction standards.	- Provision of proper drainage facilitates. - Stabilization of cut and fill slope through the application of bio engineering methods.
Low	- All type of utilization under community forest management plan.	- Maintenance of current grass cover and planting of new multipurpose grasses and shrubs.	- Mulching of terrace faces.	- Same as above	- Observing of the standard construction procedures.	- Observing of the standard construction procedures.	- Observance of the existing construction standards.	- Observance of the standard construction procedures and standards.

Appendix Table 8-3 Estimated Cost of Rehabilitation Work of a Large Landslide: An Example

Landslide specification

Location	: DPTC model landslide at 48km along Kathmandu - Trishuli Road, Tigaun, Nuwakot District
Size	: Some 8 ha consisting of 3 blocks
History	: Occurred after the earthquake of 1961 and stabilized to some extent. Reactivated since 1979
Conservation object	: Kathmandu - Trishuli Road, some 90m of which was damaged by the landslide

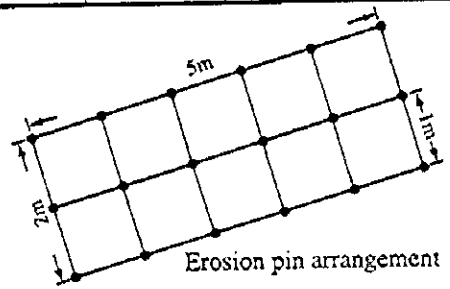
Estimated cost

Investigation cost	: Rs 1,000,000
experimental boring (2 sites) and installment of equipment for landslide monitoring (one site)	
Countermeasure cost	: Rs 6,000,000
boring for draining water (2 sites), surface water draining work (1,210m), gabion check dam construction (1,000m), road surface drainage, etc.	
Cost of field surveys, design of structures, report writing (Master Plan preparation)	: Not available
Cost of observation, management and maintenance	: Not available

Source : DPTC, Landslide Prevention Master Plan for Landslide at 48km along Kathmandu - Trishuli Road, 1995.

Appendix Table 8-4 Installation of Erosion Pins

Location	Natural Condition				Observation Period (year 1996)			Observation Results				Remarks
Ward No., VDC, Model Area	Land use	Slope (degrees)	Soil type	Rainfall (mm)	Rainfall recording date	Pin installation date	Pin reading date	Damaged or lost pins	Pins recorded (deposition)	Pins recorded (erosion)	Soil loss (tons/ha/yr)	
4, Arba Vijaya, Kaski North	Home garden	20	Dystric Regosol	3,791	Feb. 1 ~ Nov. 6	Mar. 6	Nov. 6	2	3 (0.1~1.1cm)	13 (0.1~1.2cm)	30	
2, Deurali, Kaski East	Sloping terrace	5	Destric Cambisol	2,125	Mar. 1 ~ Nov. 8	Mar. 1	Nov. 8	8	2 (0.2~1.0 cm)	8 (0.3~1.7 cm)	61	
3, Kristi Nachnechaur, Kaski West	Sloping terrace	4	〃	3,229	Feb. 25 ~ Nov. 5	Feb. 25	Nov. 4	2	1 (0.2 cm)	15 (0.2~3.0 cm)	71	
4, Thali Pokhari, Parbat North	Sloping terrace	2	〃	2,847	Mar. 8 ~ Nov. 15	Mar. 8	Nov. 15	3	6 (0.2 ~ 1.6 cm)	9 (0.3 ~ 2.9 cm)	67	
9, Tribini, Parbat South	Overgrazed grassland	38	〃	1,941	Jan. 1 ~ Oct. 31	Feb. 16	Nov. 13	7	1 (1.5 cm)	10 (0.2~4.0 cm)	110	Rainfall data from Narayani Basin Office



Erosion pin arrangement