

RESEARCH AND LABORATORY FACILITIES IN HMG NEPAL

1. Forest --
 - a) Forest Department, Kathmandu.
 - b) Forestry campus, Hetauda (Tribhuban University).
2. Agriculture --
 - a) Department of Agriculture, different research sections in Khumaltar, Lalitpur.
 - b) Different agricultural stations in Nepal.
 - c) Agriculture Campus, Rampur (Tribhuban University).
3. Hydrology and Meteorology --
 - a) Department of Irrigation, Hydrology and Meteorology.
4. Soil and Water Analysis --
 - a) Department of Agriculture, Soil Science and Agricultural Chemistry Section, Khumaltar, Lalitpur.
 - b) Department of Forests, Kathmandu.
 - c) Department of Soil and Water Conservation, Kathmandu.
5. Geology --
 - a) Department of Geology and Mines, Kathmandu.
6. Engineering Structure --
 - a) Department of Housing and Physical Planning, Kathmandu.
 - b) Department of Roads, Kathmandu.
 - c) Engineering Campus (Tribhuban University) Pulchoak, Lalitpur.
7. Satellite photos and Aerial photos --
 - a) Department of Soil and Water Conservation Kathmandu.
 - b) Department of Forests, Kathmandu.
 - c) Department of Survey, Kathmandu.

ACCOMMODATION REQUIREMENTS (Tentative)

(A) Office Buildings – Three in Number (Two storied).

4.	Research building –	700 m ²
1.	Implementation Bldg. –	395 m ²
1.	Conservation Education Bldg. –	580 m ²

Total – 1675 m (say 1700 m²)

Type of the Rooms	Buildings (space in m ²)		
	Research	Implementation	Education
Project Manager's Room	–	one 30	–
Project Co. Manager's Room	–	one 15	–
Consultant's Room	two 2x15=30	one 15	–
Senior Officer's Room	one 15	one 15	one 15
Administration Room (including all staff)	–	one 25	–
Account Room (including all staff)	one 15	one 20	one 15
Reception and Visitor's Room	one 25	–	–
Laboratory and Work Room	five 5x50=250	one 50	one 50
Darkroom (Photolab)	one 25	–	–
Model or Display Room	one 25	one 25	one 100
Library Cum Meeting Hall	one 100	–	–
Auditorium Cum Lecture Hall	–	–	one 200
Storeroom	one 30	one 30	one 30
Cartography Room	–	one 25	–
Lower Staff Room	one 25	one 25	one 25
Bathroom	five 5x12=60	five 5x12=60	five 5x12=60
Passage, Balconies and Other Open Spaces (15 % of the total)	100 (approx)	60 (approx)	85 (approx)
Total:–	700 m²	395 m²	580 m²
Grand Total =	1675 m² (say 1700 m²)		

(B) Garage

1	For Bus	=	50 m ²
4	Jeeps	=	80 m ²
1	Workshop	=	50 m ²
1	Building (Staffroom + Storeroom)	=	50 m ²
Total		=	230 m²

- (C) Hostel for Trainees: 600 m² (Two storied)
 Required – 20 Bed rooms (Double bed)
 – 4 Bathrooms + Toilets
 – 2 Common rooms
 – 1 Dining room (common for all)
 – 1 Kitchen
- (D) Guest House: 300 m²
 – 4 Suites (Double bed with attached bathroom)
 – 1 Living cum Dining room
 – 1 Kitchen
- (E) A-Type Residential Bungalow: 400 m² (Two in No. each with 200 m² floor area)
 – 3 Bedrooms
 – 1 Living cum Dining room
 – 1 Kitchen
 – 2 Bathroom
- (F) B-Type Bungalow: 600 m² (six in No. each with 100 m² floor area)
 – 2 Bedrooms
 – 1 Living cum Dining room
 – 1 Kitchen
 – 2 Bathrooms
- (G) C-Type Building : Total 2250 m² (30 flats each with 75 m² floor area)
 (Flat System)
 – 2 Bedrooms
 – 1 Living cum Dining room
 – 1 Kitchen
 – 1 Bathroom
- (H) D-Type Building: Total 2450 m² (35 flats each with 70 m² floor area)
 (Flat System) – Same as C-Type but is comparatively smaller than the former.
- (I) E-Type Building: Total 500 m² (10 Quarters each with 50 m² floor area)
 (Twin Quarters)
 – 2 Bedrooms
 – 1 Small Visitors room
 – 1 Kitchen cum Dining room
 – 1 Bathroom

LAND USE SITUATION IN 1967 AND IN 1972

Tributary's Catchment Number	No. 1			No. 2			No. 3			No. 4		
	1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change
Forest	(32.3) 577	(0.0) 0	Δ577	(8.0) 108	(1.6) 22	Δ86	(49.4) 264	(0.0) 0	Δ264	(16.5) 71	(2.3) 10	Δ61
Shrub Bush	(25.9) 462	(59.8) 1068	606	(30.2) 410	(9.8) 133	Δ277	(15.1) 81	(41.6) 222	141	(39.2) 168	(16.1) 69.0	Δ99
Grass	(14.1) 252	(5.0) 89	163	(33.4) 453	(38.1) 517	64	(0.0) 0	(4.3) 23	23	(0.0) 0	(4.1) 18	18
Eroded	-	(0.9) 16	16	-	(6.0) 81	81	-	(4.3) 23	23	-	(11.1) 48	48
Agriculture	(27.7) 494	(34.3) 612	118	(28.4) 385	(44.5) 603	218	(35.3) 189	(49.7) 266	77	(44.3) 190	(66.4) 284	94
Total	ha 1785	1785		1356	1356		534	534		429	429	

(32.3) - percent
577 - hectares

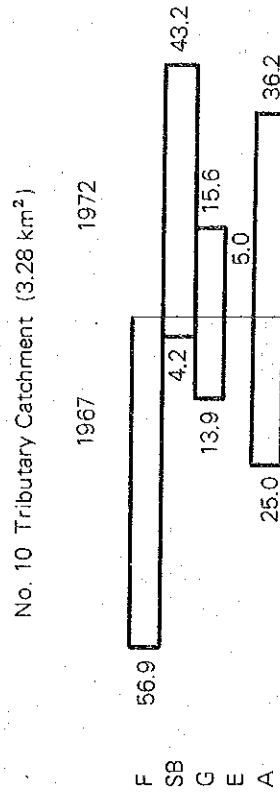
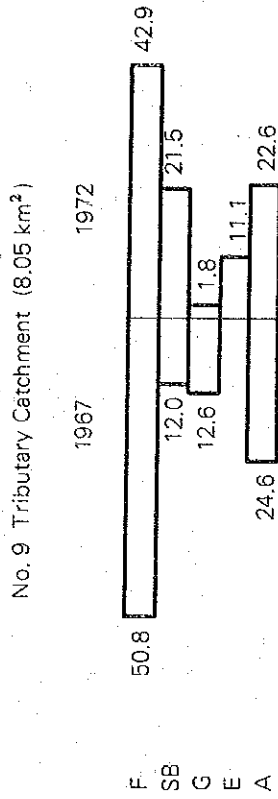
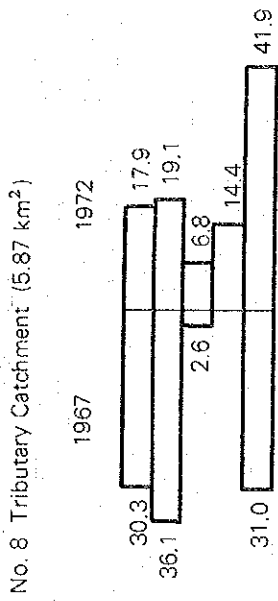
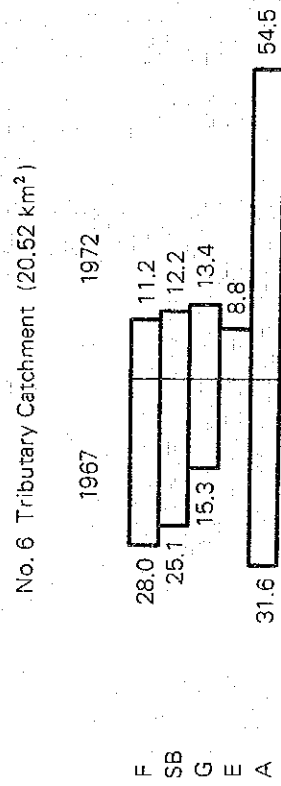
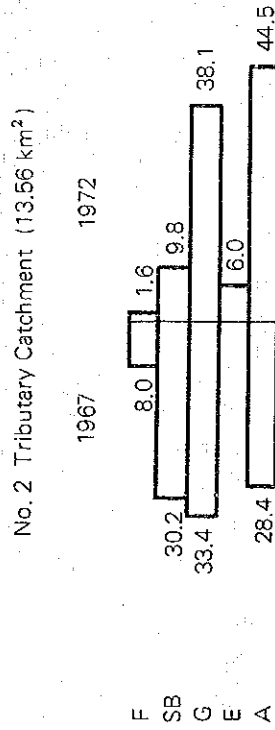
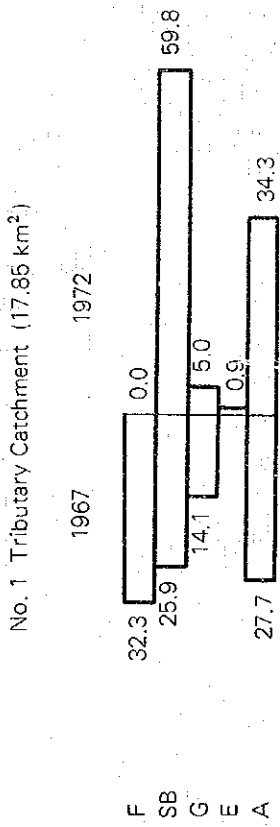
A ₁			No. 5			No. 6			No. 7			A ₂ - A ₁		
1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change
(24.9) 1020	(0.8) 32	Δ988	(0.0) 0	(0.0) 0	0	(28.0) 575	(11.2) 230	Δ345	(14.0) 86	(0.0) 0	Δ86	(20.0) 661	(6.9) 230	Δ431
(27.3) 1121	(36.4) 1492	371	(16.2) 105	(3.1) 20	Δ85	(25.1) 515	(12.2) 250	Δ265	(7.8) 48	(6.8) 42	Δ6	(20.2) 668	(9.4) 312	Δ356
(17.2) 705	(15.8) 647	58	(11.1) 72	(12.2) 79	7	(15.3) 314	(13.4) 275	39	(14.0) 86	(22.8) 139	53	(14.3) 472	(14.9) 493	21
-	(4.1) 168	168	-	(3.7) 24	24	-	(8.8) 181	181	-	(11.7) 71	71	-	(8.3) 276	276
(30.7) 1258	(43.0) 1765	507	(72.6) 470	(81.0) 524	54	(31.6) 648	(54.5) 1116	468	(64.3) 391	(58.6) 359	32	(45.6) 1509	(60.4) 1999	490
4104	4104		647	647		2052	2052		611	611		3310	3310	

No. 8			No. 9			No. 10			No. 11			No. 12		
1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change
(30.3) 178	(17.9) 105	Δ73	(50.8) 409	(42.9) 347	Δ62	(56.9) 186	(0.0) 0	Δ186	(7.7) 44	(0.0) 0	Δ44	(0.0) 0	(3.7) 30	30
(36.1) 212	(19.1) 112	Δ100	(12.0) 97	(21.5) 173	76	(4.2) 14	(43.2) 142	128	(37.8) 216	(18.0) 103	Δ113	(31.1) 253	(9.4) 76	Δ177
(2.6) 15	(6.8) 40	25	(12.6) 101	(1.8) 14	87	(13.9) 46	(15.6) 51	5	(5.6) 32	(17.5) 100	68	(0.0) 0	(7.8) 63	63
-	(14.4) 85	85	-	(11.1) 89	89	-	(5.0) 16	16	-	(13.4) 77	77	-	(5.1) 42	42
(31.0) 182	(41.9) 245	63	(24.6) 198	(22.6) 182	Δ16	(25.0) 82	(36.2) 119	37	(49.0) 279	(51.2) 291	12	(68.9) 560	(74.0) 602	42
587	587		805	805		328	328		571	571		813	813	

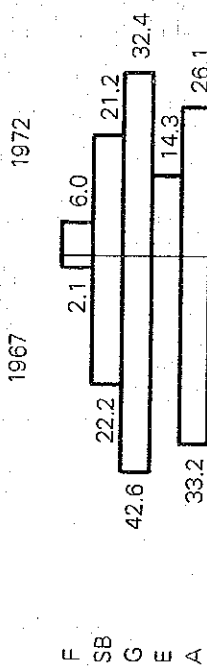
Tributary's Chatchment Number	No. 13			A ₃ - A ₂			No. 14			No. 15		
	1967	1972	Change	1967	1972	Change	1967	1972	Change	1967	1972	Change
Forest	(5.4) 40	(0.5) 4	Δ36	(22.3) 857	(12.7) 486	Δ371	(2.1) 32	(6.0) 93	61	(20.4) 187	(0.0) 0	Δ187
Shrub Bush	(22.6) 165	(17.8) 130	Δ35	(24.9) 957	(19.2) 736	Δ221	(22.2) 343	(21.2) 328	Δ15	(26.9) 246	(44.9) 411	165
Grass	(9.1) 67	(15.0) 110	43	(6.8) 261	(9.9) 378	117	(42.6) 658	(32.4) 501	Δ157	(19.6) 179	(10.0) 92	Δ87
Eroded	-	(3.2) 23	23	-	(8.7) 332	332	-	(14.3) 221	221	-	(22.2) 203	203
Agriculture	(62.9) 460	(63.4) 465	5	(45.9) 1761	(49.6) 1904	143	(33.2) 513	(26.1) 403	Δ110	(33.1) 303	(22.8) 209	Δ94
Total	732	732		3836	3836		1546	1546		915	915	

No. 16			Whole - A ₃			Whole Catchment Area		
1967	1972	Change	1967	1972	Change	1967	1972	Change
(6.9) 29	(0.0) 0	Δ29	(8.6) 248	(3.2) 93	Δ155	(19.7) 2786	(5.9) 841	Δ1945
(21.6) 92	(30.1) 128	36	(23.6) 681	(30.0) 867	186	(24.2) 3427	(24.1) 3407	Δ20
(21.6) 92	(4.8) 20	Δ72	(32.2) 929	(21.2) 613	Δ316	(16.7) 2367	(15.1) 2131	Δ236
-	(0.3) 1	1	-	(14.7) 425	425	-	(8.5) 1201	1201
(50.0) 212	(64.7) 276	64	(35.6) 1028	(30.8) 888	Δ140	(39.3) 5556	(46.4) 6556	1000
425	425		2886	2886		14136	14136	

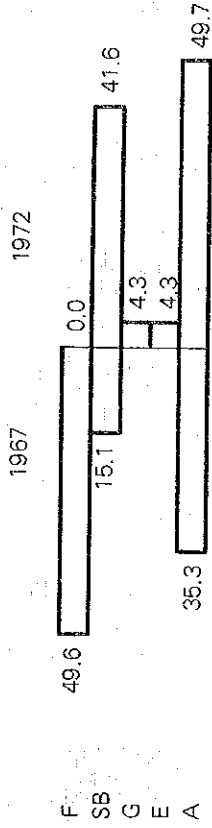
Land Use Situation in 1967 and 1972



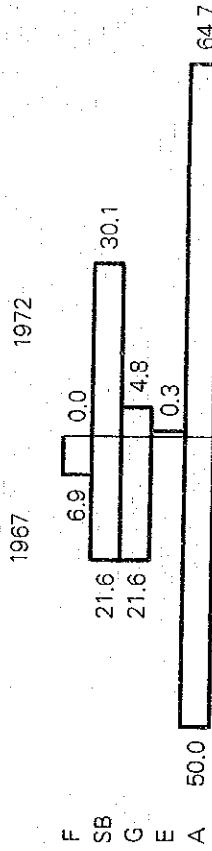
No. 14 Tributary Catchment (15.46 km²)



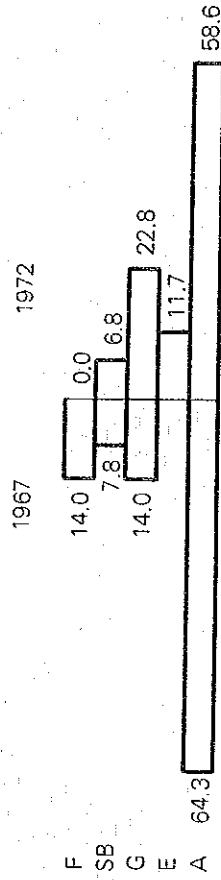
No. 3 Tributary Catchment (5.34 km²)



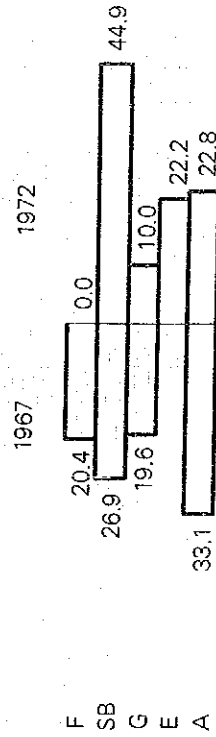
No. 16 Tributary Catchment (4.25 km²)



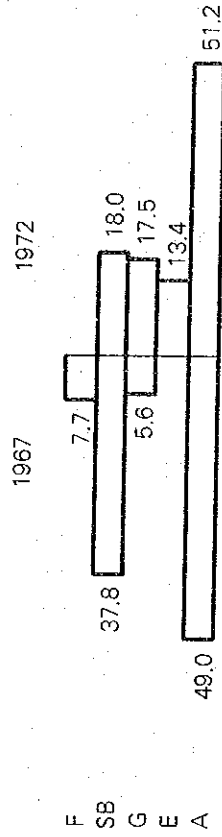
No. 7 Tributary Catchment (6.11 km²)



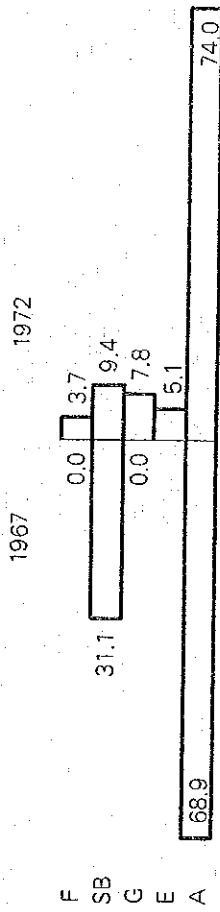
No. 15 Tributary Catchment (9.15 km²)



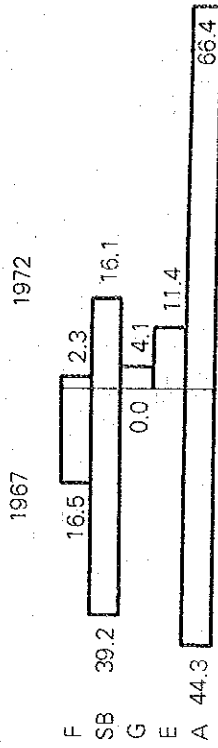
No. 11 Tributary Catchment (5.71 km²)



No. 12 Tributary Catchment (8.13 km²)

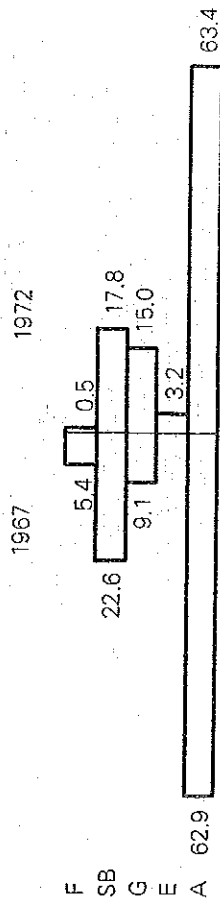


No. 4 Tributary Catchment (4.29 km²)

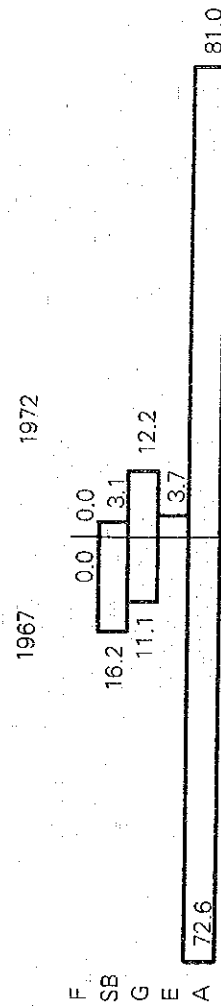


See Map No. I and No. II

No. 13 Tributary Catchment (7.32 km²)



No. 5 Tributary Catchment (6.47 km²)



ANALYSIS OF SOIL SAMPLE FROM JHIKU-KHOLA CATCHMENT AREA
(MAY 1978)

Six soil samples of cultivated areas were taken in different places of the Jhigu Khola catchment area in the month of March and May 1978. They were analyzed in the department's soil laboratory in Kathmandu.

Sample 1 – From Bhetwal-thoak, Bagwati Village cultivated and unirrigated terrace land.

Aspect – South – West,

Alt. – 1400 m.

Airtemp – (11.00 hrs) – (24th March 1978)

Sample 2 – Panchkhal village (Road side), cultivated and irrigated flat land.

Alt. – 940 m.

Airtemp – (14.00 hrs) – (26th March 1978)

Sample 3 – Chihanetar, Rampur village (near Panchkhal), cultivated and irrigated flat land.

Alt. – 940 m.

Airtemp – (10.00 hrs) – (27th March 1978)

Sample 4 – Patlekhet (near Dhulikhel), cultivated and unirrigated terrace land.

Aspect – North – West

Alt. – 1650 m.

Airtemp – (7.30 hrs) = 20°C (7th May 1978)

Sample 5 – Khanigaun, Sarsiunkharka, cultivated and unirrigated terrace land.

Aspect – north west.

Alt. – 1350 m.

Airtemp – (14.00 hrs.) = 22°C (9th May 1978).

Sample 6 – Jaharetar, Ampghari, cultivated and irrigated flat land.

Alt. – 930 m.

Airtemp – (10.00 hrs) = 21°C (11th May 1978)

Result of the Soil Sample Test

Sample Nos.	PH	Chemical Analysis				Mechanical Analysis			
		P ₂ O ₅ lbs per acre	K ₂ O lbs per acre	Nitrogen %	Carbon %	Sand %	Silt. %	Clay %	Soil Texture
1.	6.4	858.0	1725.0	0.0303	0.23	36.10	28.50	35.40	Sandy Loam
2.	6.1	352.0	483.0	0.661	0.10	32.10	37.40	30.50	" "
3.	5.9	364.0	411.0	0.07	0.02	56.10	10.38	33.52	Sandy Clay
4.	5.1	88.0	616.0	0.049	0.21	30.10	19.90	50.00	Clayey Loam
5.	6.5	628.0	1725.0	0.21	0.25	32.10	24.20	43.70	" "
6.	5.9	308.0	529.0	0.230	0.27	26.10	24.50	39.40	" "

The acidic nature of the soil in all the samples shows a deficiency of lime. This shows evidence of washing out of the soil in the terraces (samples 1, 4, 5) and repeated floods together with the accumulation of sand in the valley flat lands (Sample 2, 3, 6). Although a very general idea can be obtained from such a small number of soil samples, even then the samples show low to poor pumus soil.

PRECIPITATION SUMMARY IN AND AROUND THE PROJECT AREA (Year - 1971 to 1975)

Months Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total (Annual) 24 hrs. & date	Maximum in 24 hrs. & date	Number of Rainy days in					
	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0			> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0
BAHRABISE																				
1971	1	13	44	135	175	689	553	766	372	232	26	0	3006	123/13 Aug.	185	88	52	35	9	1
1972	11	28	42	33	109	318	693	629	202	104	17	0	2184	101/25 Jul.	133	63	44	17	8	1
1973	35	39	62	210	332	853	571	881	437	268	50	0	3738	192/19 Aug.	156	67	39	31	14	5
1974	0	0	49	159	177	468	830	913	334	102	0	15	3047	104/18 Aug.	145	53	40	38	13	1
1975	23	54	117	99	90	634	442	488	48	6	6	0	2007	176/30 Jun.	115	58	35	14	6	2
Average	(0.5)	(9.0)	(2.2)	(4.5)	(6.3)	(21.2)	(22.1)	(26.3)	(10.0)	(5.1)	(0.7)	(0.1)	2797	-	147	66	42	27	10	2
Mean	14	27	63	127	177	592	618	735	279	142	20	3								
DHULIKHEL																				
1971	4	13	21	133	108	529	222	351	53	100	1	0	1535	99/11 Jun.	134	88	28	15	3	0
1972	3	26	77	23	57	190	438	354	238	112	26	0	1544	160/6 Aug.	99	46	36	13	3	1
1973	25	44	71	24	52	472	425	357	456	224	25	1	2176	105/25 Jul.	127	72	29	16	7	3
1974	12	6	24	66	87	112	572	397	255	54	0	9	1594	88/23 Jul.	121	70	30	18	3	0
1975	39	26	7	51	116	152	704	199	387	66	0	0	1747	134/1 Jul.	119	68	35	9	5	2
Average	(1.0)	(1.3)	(2.3)	(3.4)	(4.9)	(16.9)	(27.5)	(19.3)	(16.2)	(6.5)	(0.6)	(0.1)	1719	-	120	69	32	14	4	1
Mean	17	23	40	59	84	291	472	332	278	111	10	2								
DOLALGHAT																				
1971	0	11	27	243	161	271	363	319	60	26	0	0	1481	41/4 Jul.	110	35	62	13	0	0
1972	0	16	76	54	68	191	404	208	186	92	32	0	1327	52/6 Jul.	92	46	30	13	3	0
1973	2	28	29	14	16	342	307	307	239	84	12	0	1380	121/11 Aug.	79	38	22	14	4	1
1974	10	10	25	34	60	68	345	234	244	18	0	4	1052	94/24 Jul.	80	44	21	13	2	0
1975	27	7	3	72	97	151	387	206	249	2	0	0	1201	107/28 Jul.	89	45	31	9	3	1
Average	(3.6)	(1.1)	(2.5)	(6.4)	(6.2)	(15.9)	(28.0)	(19.3)	(15.3)	(3.4)	(0.7)	(0.1)	1288	-	90	42	33	12	2	0
Mean	8	14	32	83	80	205	361	255	196	44	9	1								

Months Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total (Annual)	Maximum in 24 hrs. & date	Number of Rainy days in				
	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0	> 1.0
KHOPASI (Panauri Power-house)																			
1971	0	26			58	177	432	338	75	79	0	0		59/30 Jul.					
1972	31	43	69	12	132	388	221	112	299	109	22	0		60/30 Oct.					
1973	12	6	31	53	133	124	532	390	240	221	22	0	1744	106/25 Jul.	125	76	31	12	4
1974	51	15	5	45	136	149	607	251	309	42	0	2	1668	58/31 Aug.	121	66	32	16	7
1975	(1.6)	(1.5)	(2.4)	(2.6)	(7.7)	(14.1)	(28.7)	(17.6)	(16.3)	(6.9)	(0.6)	(0.0)	1632	128/28 Jul.	109	59	33	12	3
Average	24	35	38	115	210	428	262	242	103	103	9	0	1489	-	118	67	32	13	5
Mean																			
NAGARKOT																			
1971	3	6	94	61	58	237	496	437	58	89	2	0		66/27 Jul.					
1972	24	33	70	6	115	633	812	1032	239	97	21	0	1641	61/16 Jul.	108	55	31	17	5
1973	12	42	56	64	162	197	487	526	828	161	29	0	3743	120/12 Aug.	122	41	31	21	28
1974	35	46	0	82	198	226	604	282	247	105	0	16	1914	81/23 Jul.	113	42	44	26	1
1975	(0.9)	(1.4)	(2.5)	(2.4)	(6.0)	(16.6)	()	(23.5)	(16.3)	(5.2)	(0.5)	(0.1)	2025	81/28 Jul.	103	38	36	20	9
Average	19	32	55	53	133	368	546	521	360	115	10	3	2215	-	112	44	36	21	11
Mean																			
PANCHKHAL																			
1971	5	4	24	152	109	426	165	253	40	67	0	0	1245	51/5 Jun.	76	33	24	18	1
1972	0	10	85	24	67	144	394	170	109	56	8	0	1067	60/28 Mar.	64	27	21	15	1
1973	8	13	37	39	4	336	252	266	264	85	11	0	1315	53/4 Oct.	68	27	21	17	3
1974	7	5	9	2	15	24	111	104	168	70	0	8	523	41/21 Sep.	70	51	17	2	0
1975																			
Average	(0.5)	(0.8)	(3.8)	(5.2)	(4.7)	(22.4)	(22.2)	(19.1)	(14.0)	(6.7)	(0.5)	(0.2)	1039		70	35	21	13	1
Mean	5	8	39	54	49	233	231	198	145	70	5	2							

Source: Climatological Records of Nepal, 1971-75 (Vol. 1), Department of Irrigation, Hydrology and Metrology.

KATHMANDU AIRPORT (10.30)

Total Monthly, Average 1968 to 1975 Precipitation (mm)

Months Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total (Annual)	Maximum in 24 hrs. & date
1968	30.1	8.5	45.3	25.5	109.6	305.7	373.5	228.2	86.9	160.4	0	0	1380	-
1969	8.6	1.4	47.6	27.4	86.9	166.1	299.7	323.9	175.3	40.3	2.0	0	581	-
1970	29.1	27.6	26.6	34.4	93.6	193.7	494.3	229.7	163.9	58.2	11.2	0	1525	-
1971	3.0	6.3	28.4	180.8	109.7	608.1	204.6	252.6	36.4	81.2	0.2	0	1511	61.9 June
1972	1.4	25.5	80.4	23.8	56.6	157.3	480.9	155.3	174.5	86.1	19.6	0	1261	43.5 October
1973	23.7	32.4	48.5	25.3	81.1	340.4	456.0	336.5	321.1	119.3	15.5	0	1800	72.4 July
1974	16.9	5.7	23.3	30.9	108.0	74.8	339.6	364.2	204.6	45.6	0	11.4	1225	59.5 August
1975	30.6	25.4	8.0	36.1	75.1	130.5	436.1	379.0	267.5	34.2	0	0	1431	66.1 August
Total	143.4	132.8	308.1	384.2	720.6	1984.6	3090.7	2269.4	1430.2	625.3	48.9	11.4		
Average Mean	17.9	16.6	38.5	48.02	90.07	248.07	386.3	283.7	178.8	78.16	6.76	1.42		
Total Variation	2.19	23.14	10.05	7.60	1.94	8.13	2.42	2.44	8.82	4.69	19.60	11.40		

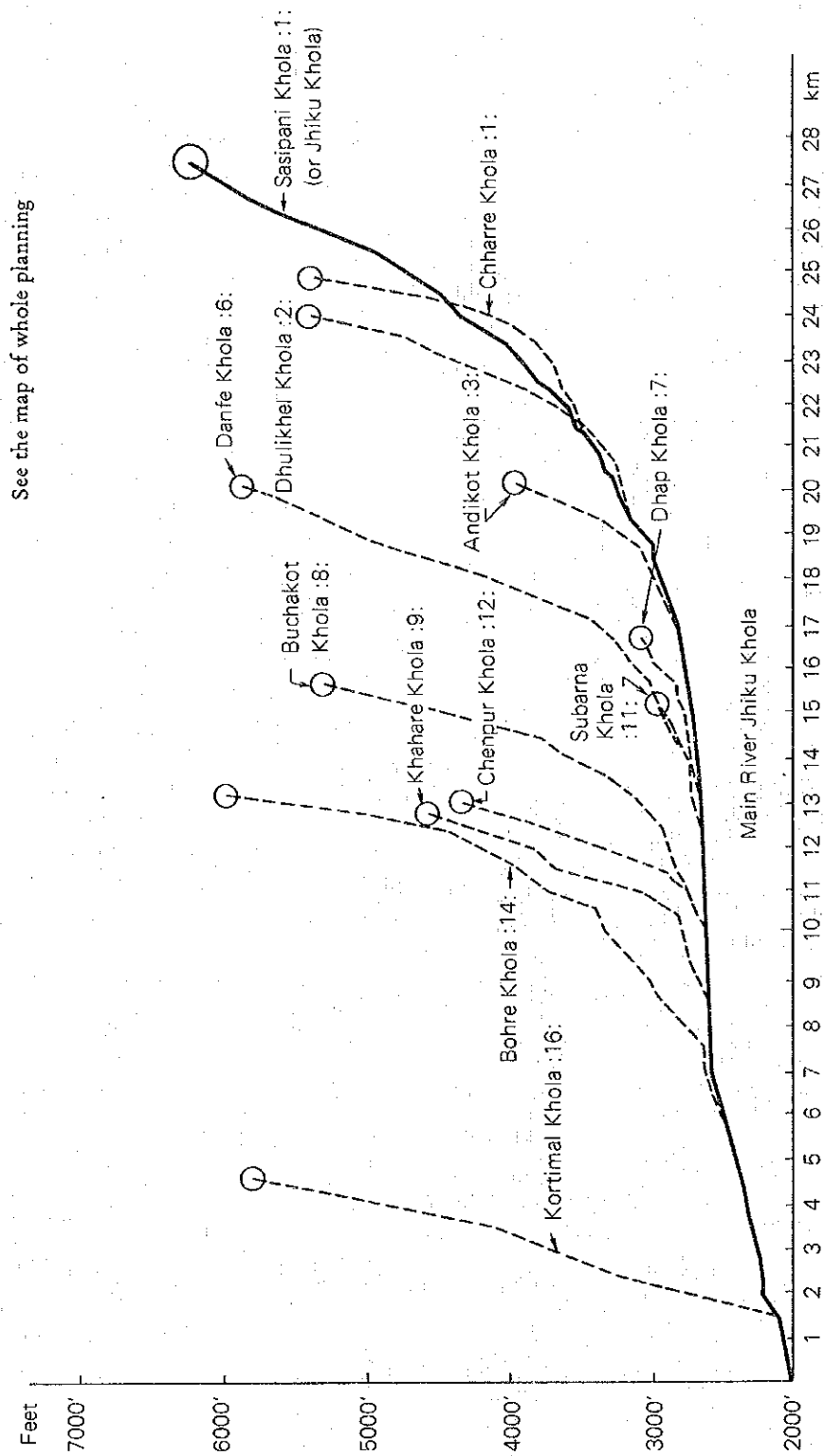
Remarks:

MONTHLY AIR TEMPERATURE (1971 -- 1975)
STATION:-- KATHMANDU

Years Months	Maximum Temperature					Minimum Temperature					Average					Relative Humidity % Observed at Upper Column -- 8 : 40 Lower Column -- 17 : 40				
	1971	1972	1973	1974	1975	1971	1972	1973	1974	1975	1971	1972	1973	1974	1975	1971	1972	1973	1974	1975
Jan.	19.6	19.6	19.7	18.0	16.0	1.8	3.3	3.6	2.0	1.9	10.7	11.5	11.6	10.0	9.0	92	95	91	95	97
Feb.	21.4	19.4	22.3	21.4	19.0	2.5	3.3	4.5	2.6	4.1	12.0	11.4	13.4	12.0	16.6	83	88	88	85	89
Mar.	25.6	26.1	25.2	25.1	24.3	6.9	8.1	6.4	7.5	7.3	16.3	17.1	15.8	16.3	15.8	78	80	80	72	78
Apr.	24.3	28.6	30.9	28.6	27.9	12.9	10.4	11.9	12.6	11.4	18.6	19.5	21.4	20.6	19.6	85	68	69	68	72
May	26.4	31.7	28.1	28.9	28.1	15.1	16.1	16.5	15.7	15.4	20.8	23.9	22.3	22.3	21.8	78	63	76	75	71
Jun.	27.1	30.3	27.3	29.4	27.8	19.5	18.6	19.5	19.2	18.8	23.3	24.4	23.4	24.3	23.3	86	75	85	75	79
July	27.8	27.9	28.4	26.4	26.0	20.0	20.4	20.5	19.8	19.6	23.9	24.2	24.5	23.1	22.8	85	89	85	89	86
Aug.	27.4	28.1	28.2	27.1	27.3	19.5	19.8	19.9	20.1	20.0	23.5	24.0	24.1	23.6	23.6	80	83	62	89	82
Sep.	28.0	26.6	26.9	26.0	25.2	18.3	18.0	18.8	17.8	18.2	23.2	22.3	22.9	21.9	21.7	88	87	90	89	84
Oct.	26.8	25.8	26.1	27.7	25.5	14.0	13.1	15.0	16.2	14.8	20.4	19.5	20.6	22.0	20.2	82	82	84	86	82
Nov.	23.8	23.6	23.7	23.8	21.3	7.2	7.9	7.4	6.2	6.5	15.5	15.8	15.6	15.0	13.9	87	89	91	89	87
Dec.	20.9	21.8	20.0	17.9	17.7	2.8	2.3	2.4	1.5	3.0	11.9	12.0	11.2	9.7	10.4	78	70	69	66	79
																94	92	92	93	79
																72	64	67	70	73

Reference:-- Climatological Records of Nepal Vol. I

GRADIENT OF THE TRIBUTARIES TO JHIKU KHOLA



DSWC/IWM Cartographic Section

S.No.	Name of the River	Length of the River	Altitude Differences to the Highest Elevation of the Watershed Down to the River Mouth		
			Top Height (m)	Bottom Height (m)	Altitude Difference (m)
1.	Dulikhel Khola	5.50	1146	915	731
2.	Danfe Khola	8.00	1799	810	989
3.	Buchakot Khola	5.75	1616	803	813
4.	Khahare Khola	4.25	1402	823	579
5.	Bohore Khola	6.93	1829	771	1058
6.	Kortimal Khola	3.15	1768	649	1119
7.	Chenpur Khola	2.75	1311	803	508
8.	Suvarna Khola	3.25	915	806	109
9.	Dhap Khola	4.25	1006	810	196
10.	Anekot Khola	3.50	1555	1204	351
11.	Chhare Khola	2.80	1646	1006	640
12.	Sasipani Khola	6.50	1951	1006	945
13.	Jhiku Khola*	27.50	1951	610	1341

* The length of the main river JHIKU KHOLA is taken from Sasipani to Sunkosi Dovan.

**POPULATION DISTRIBUTION IN THE PANCHAYATS
THAT FALL WITHIN THE JHIGU KHOLA CATCHMENT***

Serial No.	Panchayats	No. of Houses	Population
1.	Dhulikhel †	50	225
2.	Bhamarkot	750	4,000
3.	Andikot	800	4,500
4.	Panchkhal	600	4,000
5.	Bhagwati	600	4,000
6.	Palanchoak	700	4,500
7.	Sarsaun kharka	700	4,000
8.	Maithankot †	400	2,000
9.	Kanpur †	20	100
10.	Balua	600	3,000
11.	Phulbari	500	3,000
12.	Kalere	700	4,000
	Total	6,420	37,325

† part of the panchayat fall in the catchment

* source local information.

Annex 10

Place		Altitude (msl) in Meters
Methinkot	—	1480
Sangurekhola Doban	—	1200
Jhigu-Bhohare Doban	—	910
Boharegaon (satamul)	—	1260
Adhabat	—	1420
Balua (Riberbed)	—	910
Jhigu-Jaretar	—	910
Panchkhal (Parsatiya Danda)	—	1070
Panchkhal (devithan)	—	1280
Ankot	—	1330
Chharekhola	—	1080
Rabi (Bhawarkot Panchayat Bhaban)	—	1450
Rabi (Chapleti Bhanjayanj)	—	1620
Dhulikhel View Point	—	1650
Sashipani (Highest pt.)	—	1867
Jhigu-Sunkoshi Conjunction Point	—	610

Annex 11

**LIST OF SPECIES FOUND IN THE CATCHMENT AREA
WITH LOCAL AS WELL AS BOTANICAL NAME**

Local Name	Botanical Name	Family
Ainsclu	Rubus spp.	Rosaceae
Amla	Phyllanthus emblica	Euphorbiaceae
Amlisso	Thysanolema ergrostis	Gramineae
Angeri	Pieris ovalifolia	Ericaceae
Asha	Terminalia tomentosa	Combretaceae
Banmara	Eupatorium glanduosum	Compositae
Barro	Terminalia belerica	Combretaceae
Banji	Anogeissus latifolia	"
Banj	Quercus incana	Cupulifereae
Bans	Dendrocalamus spp.	Gramineae
Babiyo	Eulaliopsis binnata	Gramineae
Botdhayero	Lagerstroemia parviflora	Lythraceae
Bhojpatra	Betula alnoides	Cupuliferae
Champ	Michelia champaca	Magnoliaceae
Chilaune	Schima wallichii	Theaceae

Local Name	Botanical Name	Family
Chutro	<i>Berberis</i> spp.	Berberidaceae
Dabdabe	<i>Lanea coromendaliaca</i>	Anacardiaceae
Dhalne Katus	<i>Castanopsis indica</i>	Cupuliferae
Gamhari	<i>Gmelina arborea</i>	Verbehaceae
Guras	<i>Phododendron</i> spp.	Ericaceae
Harro	<i>Terminalia cheuula</i>	Combretaceae
Jamun	<i>Syzygium cuminii</i>	Myrtaceae
Kaphal	<i>Myrica nagi</i>	Myricaceae
Kapas (cotton)	<i>Therpesia</i> spp.	Malvaceae
Ketuke	<i>Agave</i> spp.	
Khar	<i>Themida</i> spp.	Gramineae
Khote salla (Chirpine)	<i>Pinus roxburghii</i>	Coniferae
Kimbu	<i>Morus alba</i>	Moraceae
Khanayo	<i>Ficus cunia.</i>	Urticaceae
Koiralo	<i>Bauhinia variegata</i>	Leguminoseae
Kusum	<i>Schleichera trijuga</i>	Sapindaceae
Kutmiro	<i>Litsea polyantha</i>	Lauraceae
Lampate	<i>Duabanga sonneretioides</i>	
Lapsi	<i>Spondias axillaris</i>	Anacardiaceae
Lakure	<i>Fraxinus floribunda</i>	Oleaceae
Neer	<i>Indigofera</i> spp.	Leguminose
Nimaro	<i>Ficus</i> sp.	Urticaceae
Okhar	<i>Juglans regia</i>	Juglandaceae
Paiyun	<i>Frunus cereceiodis</i>	Rosaceae
Phaldu	<i>Mitragyna parviflora</i>	Rubiaceae
Pithauli (Satibeer)	?	
Ritha	<i>Spondias</i> sp.	Meliaceae
Sal	<i>Shorea robusta</i>	Dipterocarpaceae
Sandan	<i>Ougenia Oogeinensis</i>	Myrtaceae
Semal	<i>Bombax malabaricum</i>	Bombacaceae
Shidhure	<i>Mallotus phillippinensis</i>	Euphorbiaceae
Siris	<i>Albizia</i> spp.	Leguminosae
Tanki	<i>Bauhinia retusa</i>	Leguminosae
Utis	<i>Alnus nepalensis</i>	Betulaceae

**UNIT RATE FOR JHIGU KHOLA SOIL AND WATER CONSERVATION
RESEARCH AND DEMONSTRATION PROJECT:—**

1. Fencing cost per one running meter = Rs 25.00
Assuming the area to be fenced is irregular 20 ha. of land required 2,000 running meters of fencing (i.e. about 25 percent more).
2. Plantation in eroded land with soil binding grass and shrubs —
Cost per hectare = Rs 1800.00. This includes Rs 300.00 for seed, Rs 700.00 for fertilizer, Rs 800.00 for 80 m. day labour.
3. Plantation of species for fodder, firewood and timber:—
 - (a) Cost of land clearing per hectare = 50 m. day per hectare
 - (b) Cost of pitting per hectare = 63 m. day/ha i.e. 40 pits per man per day (Pits spacing 2 m x 2 m)
 - (c) Cost of planting per hectare = 50 m. day/ha i.e. 50 plants planted per man per day in a hilly terrain. Therefore total cost of planting = a+b+c.

$$= 50 + 63 + 50 = 163 \text{ m day/ha}$$

$$= \text{Rs } 1630.00 \text{ per hectare.}$$
 - (d) Cost of plant material at the planting site, including nursery cost and transportation of plants

$$= \text{Rs } 0.30 \text{ per plant}$$

$$= \text{Rs } 750.00 \text{ per hectare, assuming}$$
 2500 plants req. for 2 m x 2 m spacing.
 Hence total cost of plantation per hectare

$$= \text{Rs } 1630 + \text{Rs } 750 = \text{Rs } 2380.00 \text{ per hectare.}$$
4. Maintenance:
 - (a) 2 weedings per year; weedings for 100 plants

$$\text{per man per day} = 50 \text{ m. day/hectare}$$

$$= \text{Rs } 500 \text{ per ha. per year.}$$
 - (b) Replacement of losses (15 % maximum)

$$= 28 \text{ m. day/hectare}$$

$$= \text{Rs } 280.00/\text{hectare, assuming Rs } 10/\text{m. day.}$$
5. Improvement of small irrigation channels
= Rs 20,000 per km.
6. Operation for land use change such as tilling, hoeing, levelling etc. is 100 m. days per hectare (approx).
7. Road repair and improvement, a lump sum amount of Rs 10,000 per km. for the 1st year, and 10 laborers two times in a year in the subsequent years (say for 4 years)

8. Road construction (fair weather road), a lump sum amount of Rs 20,000.00 per km and the repair cost is 10 laborers two times in a year for 4 years.
9. Trail improvement 20 m. days/km for the 1st year and 5 m. days/km for the subsequent years (say for 4 yrs).
10. New trail construction 80 m. days/km, and 5 m. days/km per year for maintenance.
11. Cost of building construction = Rs 125/ft² = Rs 1375/m², excluding sanitation and electricity fittings.
12. Terrace improvement per ha. = Rs 5000.00, assuming 500 m. day/ha.
13. Rehabilitation of gully, landslides, at Rs 60/m³ of loose stones Rs 150/m³ loose stones with gation and Rs 300/m³ cement concrete check dams.
14. Roadside slope stabilization at Rs 77,000.00/km, a tentative figure.
15. River training work, with embankment and spur is Rs 10,00,000.00 per km.
16. Drinking water supply at Rs 50,000.00 per km, including the construction of water storage tanks.
17. 1 US\$ = 11.90 N. Rupees.

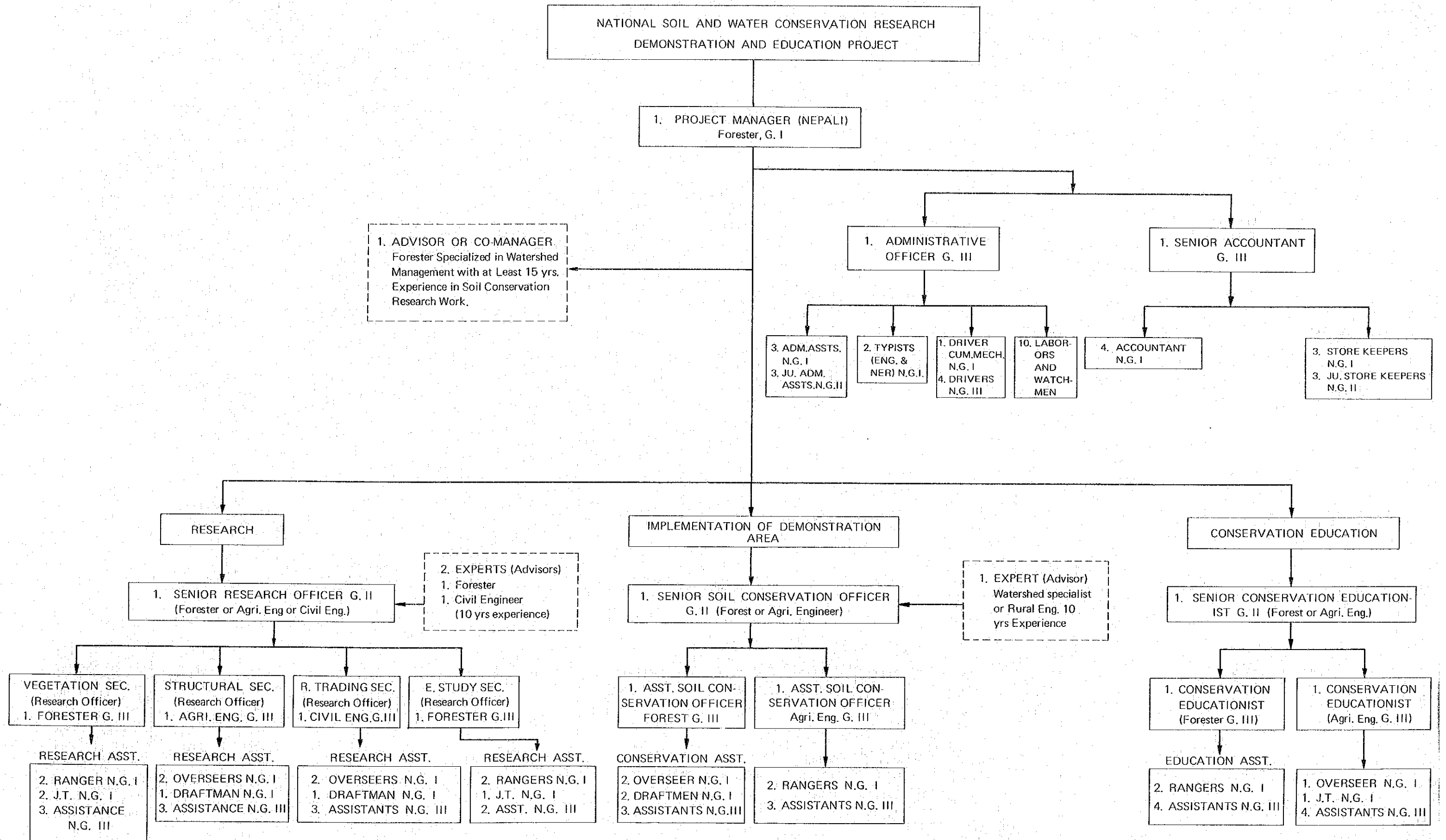
Estimated Pay Scale for H.M.G. Staff

Gazetted Ist class	—	1300 + 30 % + 300 (project manager allowance) = Rs 2000/approx. per month.
Gazetted IInd class	—	945 + 30 % = Rs 1300/per month.
" IIIrd class	—	700 + 30 % = Rs 1000/ "
Non-Gazetted Ist class	—	500 + 50 % = Rs 750/ "
" IInd class	—	400 + 50 % = Rs 600/ "
" IIIrd class	—	300 + 50 % = Rs 450/ "
Peon & Watchman	—	200 + 50 % = Rs 250/ "

Activities	1977				1978								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1. Selection of Site	—												
2. Reconnaissance Survey		—											
3. Interview with leaders and farmers + Land use study			—										
4. Completion of Part-I report writing					—								
5. Landuse study and mapping						—							
6. Completion of part II + Final report										—			

Selected Bibliography

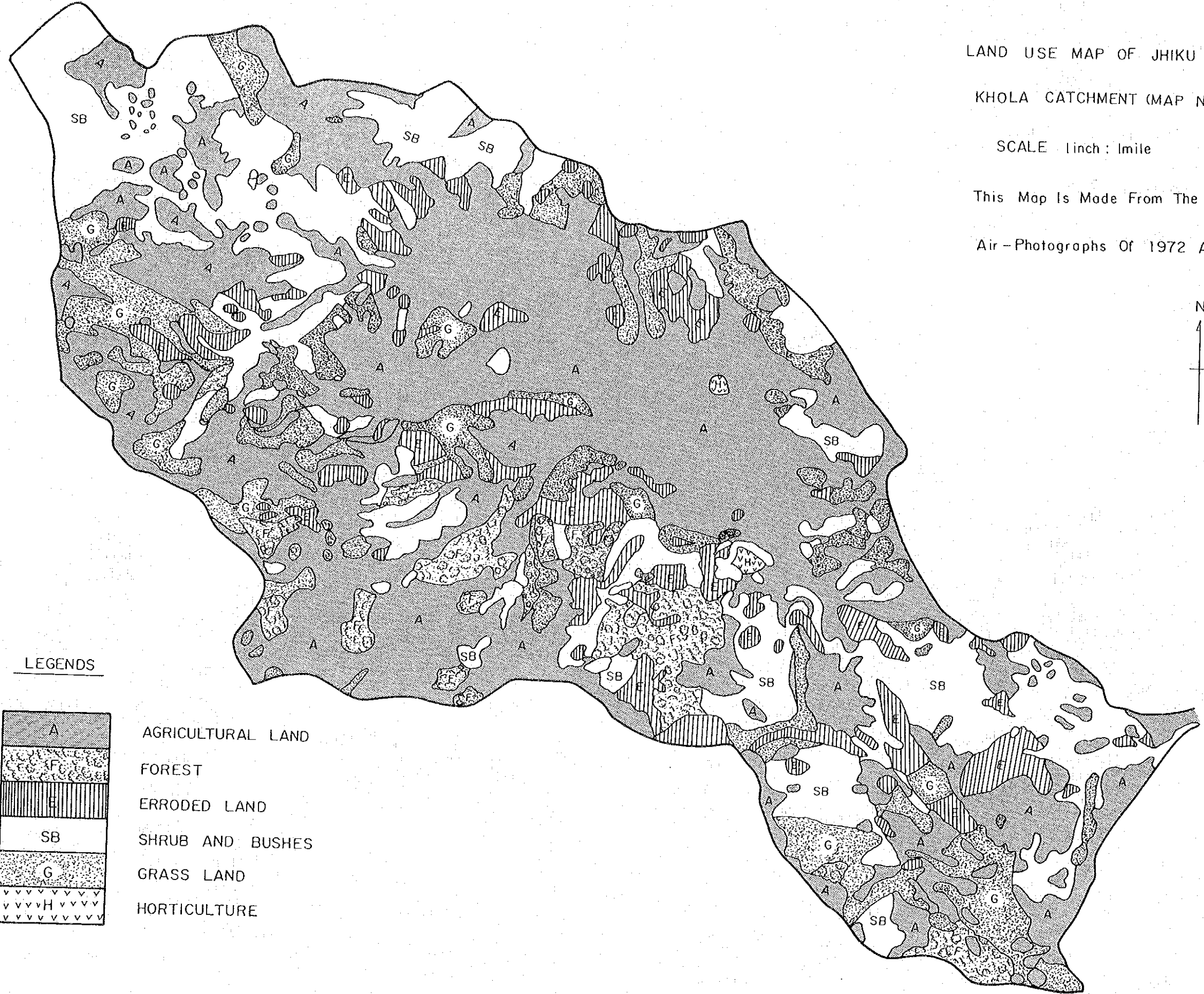
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2. APROSC, Reconnaissance Survey of Integrated Rural Development Project for Mahakali Hills, Oct., 1977.
3. APROSC, Prefeasibility study for Integrated Rural Development Project for Rapti zone, December 1977.
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5. Sushil Bhattarai, Report on the Reconnaissance Survey for the Soil/Water Conservation in the Lothar Catchment Area, 1976. and review of the same by B. Hiller in June, 1977.
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LAND USE MAP OF JHIKU
 KHOLA CATCHMENT (MAP NO.1)

SCALE 1inch : 1mile

This Map Is Made From The
 Air-Photographs Of 1972 AD



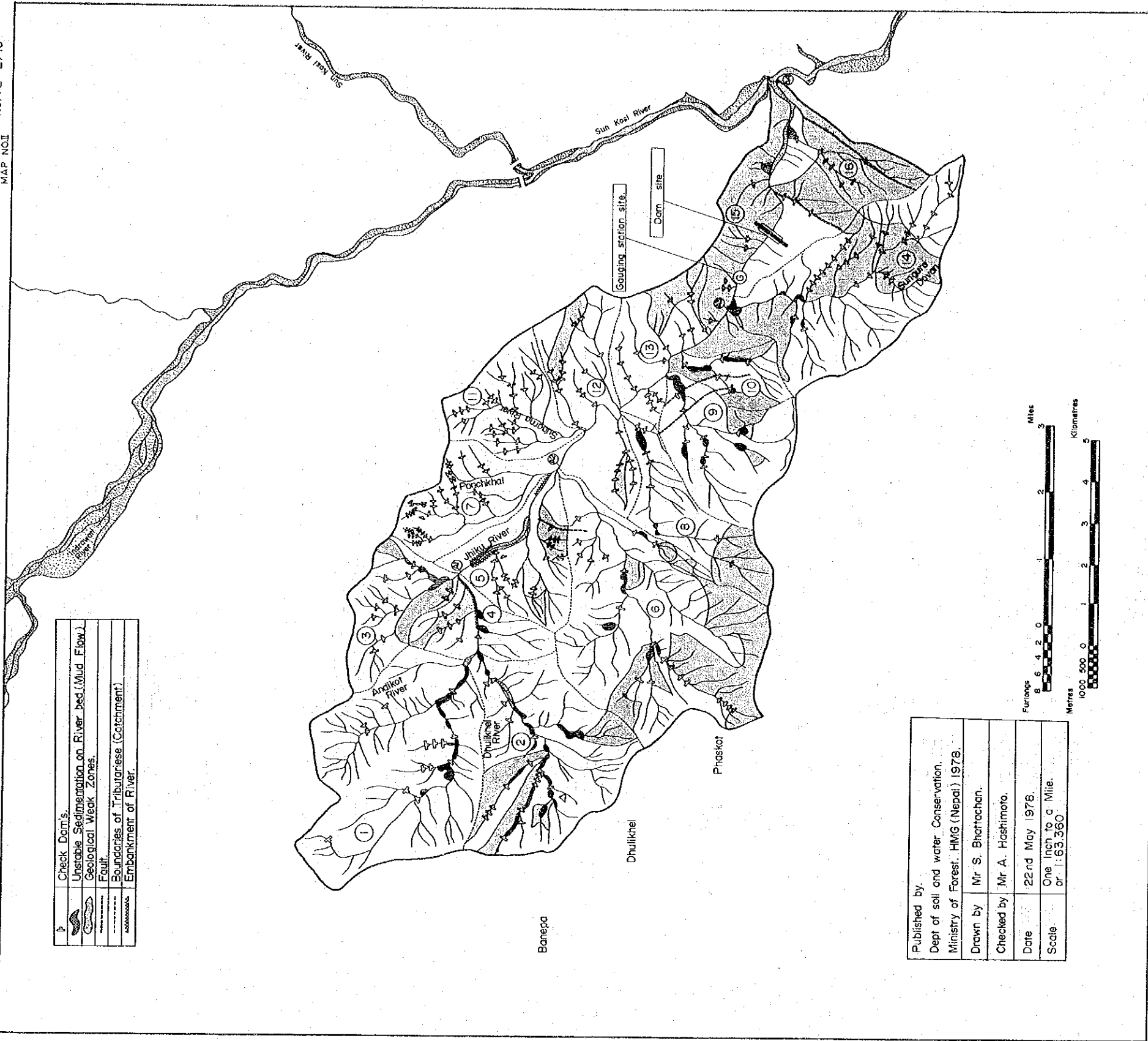
LEGENDS

A	AGRICULTURAL LAND
F	FOREST
E	ERRODED LAND
SB	SHRUB AND BUSHES
G	GRASS LAND
H	HORTICULTURE

PLANNING MAP ON SOIL AND WATER CONSERVATION WORKS IN JHIKU RIVER CATCHMENT

EAST, NO. 1 AND
KATMANDU VALLEY DISTRICTS.

MAP NO. 1
NO. 72 E/10



Published by:
Dept of soil and water Conservation,
Ministry of Forest, HMG (Nepal) 1978.
Drawn by Mr. S. Bhattachan.
Checked by Mr. A. Hashimoto.
Date 22nd May 1978.
Scale One inch to a Mile.
or 1:63,360

No. of Tributaries	Size of the each Catchment Area	Embankment of River	No. of Check Dams	Plantation Area		No. of Tributaries	Size of the each Catchment Area	Embankment of River	No. of Check Dams	Plantation Area	
				Eroded land	Shrub and bushes					Eroded land	Shrub and bushes
1	17.85 Km ²	0 m	14	16 ha		10	328 Km ²	0 m	4	16 ha	
2	13.56	0	19	81		11	571	0	24	77	
3	5.34	900	11	23		12	813	0	23	42	
4	4.29	1,000	7	48		13	732	0	18	23	
A1	41.04	1,300	50	168		14	3636	0	84	932	
5	8.47	2,000	22	24		15	1546	0	29	221	
6	20.52	0	21	181		16	915	0	10	203	
7	6.11	0	45	71		16	425	0	7	1	
A2	33.10	2,000	88	276		44	2885	0	46	425	
8	5.87	0	7	85				3,300	268		
9	8.05	0	8	59			TOTAL: 141.36			1,201	

JICA