

10. KARIBEE PROJECT AREA

1. Location

- (1) District: Mongar Block: Salling Village: Karibee
- (2) Location: 50 minutes by vehicle from district capital through the national road, and 40 minutes walk from the national road.

2. Topography

- (1) Elevation: Intake Structure ; (No intake)
Farm Land ; EL 720 m - EL 900 m
- (2) Slope and Direction of Farm Land
Slope: 1/4 Direction: North to West

3. Climate and Water Resources

- (1) Climate (Station: Lingmethang)

Temperature

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	23.2	25.3	26.5	29.2	30.7	32.0	31.1	31.6	30.5	29.0	26.2	23.7	28.3
Min	9.0	11.6	14.3	18.3	20.4	24.2	24.1	24.1	22.5	17.3	13.8	10.6	17.5
Average	16.1	18.5	20.4	23.8	25.6	28.1	27.6	27.9	26.5	23.2	20.0	17.2	22.9

Relative Humidity

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	76.1	75.0	72.2	71.1	72.8	82.3	84.2	80.7	85.4	79.4	78.9	81.4	78.3

Rainfall

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0.5	13.2	49.7	101.8	64.0	187.0	182.7	118.7	187.3	64.0	6.0	9.9	984.8

- (2) Water Resource : No intake

4. Demography

- (1) Population

- 1) Block Population 4,700 (Salling)
- 2) Project Scheme Population
- a. Population 178 (100%)
(Male: 56%, Female: 44%)
- b. Student (5-14 years) 50 (28%)
- c. Labour Force (15-54 Years) 96 (54%)

Age	Male	Female	Total
0 - 4	13	6	19
5 - 9	14	11	25
10 - 14	13	12	25
15 - 19	12	7	19
20 - 24	13	6	19
25 - 29	5	9	14
30 - 34	10	4	14
35 - 39	1	4	5
40 - 44	0	4	4
45 - 49	7	2	9
50 - 54	6	6	12
55 - 59	2	5	7
60 - 64	1	1	2
65 -	2	2	4
Total	99	79	178

- 3) Share of Population in Block 4%
- (2) No. of Household
- 1) Block 600
- 2) Project Area
- a. Total 21
- b. Share of (a) to (1) 4%
- 3) Average Family Size of the Scheme 8.5

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Karibee project area are as follows:

Cambisols generally located in paddy field and dry land.

Lithosols/Regosols .. steep slopes, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet ¹	Dry	Tsheri	Others	Total
Project Area	(2)	20	2	0	22(2)
Average Holdg Size	(0.10)	0.95	0.09	0	1.04(0.10)

¹: Wet land is in Masangdaza project area.

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	(2)	(1.5)	(3)
	- Buckwheat	0	0	0
	- Maize	0	0	0
	- Total	0	-	-
2) Dry Land	- Maize	33	1.5	50
	- Wheat	0	0	0
	- Mustard	0	0	0
	- Buckwheat	0	0	0
	- Barley	0	0	0
	- Potato	0	0	0
	- Chilli	0	0	0
	- Total	33	-	-
3) Tsheri Land	- Maize	0.4	1.6	0.6
	- Buckwheat	0	0	0
	- Soyabeans	0	0	0
	- Total	0.4	-	-

(3) Cropping Intensity (%)

- Wet land	(100)
- Dry land	165
- Tsheri land	20
- Total land (324 ha)	147

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	130	5	2	17
Adult	162	14	11	67
Total	292	19	13	84
Average Holding per Household	13.9	0.9	0.6	4.0

7. Irrigation

No irrigation facility exists. It is possible to extend the canal from Karbithang project area together with renovation of the scheme.

8. Rural Facilities

(1) Access Road and Necessity of Improvement

The foot path is passable only on foot or by horse and needs the renovation owing to the much exposure of rocks in all routes.

(2) Other Public Facilities

Water Supply

9. **Farmers' Intension for Development**

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Strengthening of agricultural extension
- (3) Construction of feeder road

10. **Remarks**

The place of residence, Jangdung village, is unfavorably located for proceeding to the cultivation works and the living conditions seem to be bad. Therefore, most of villagers are shifting to Karibee area. (15 farmers have already moved to Karibee area.)

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

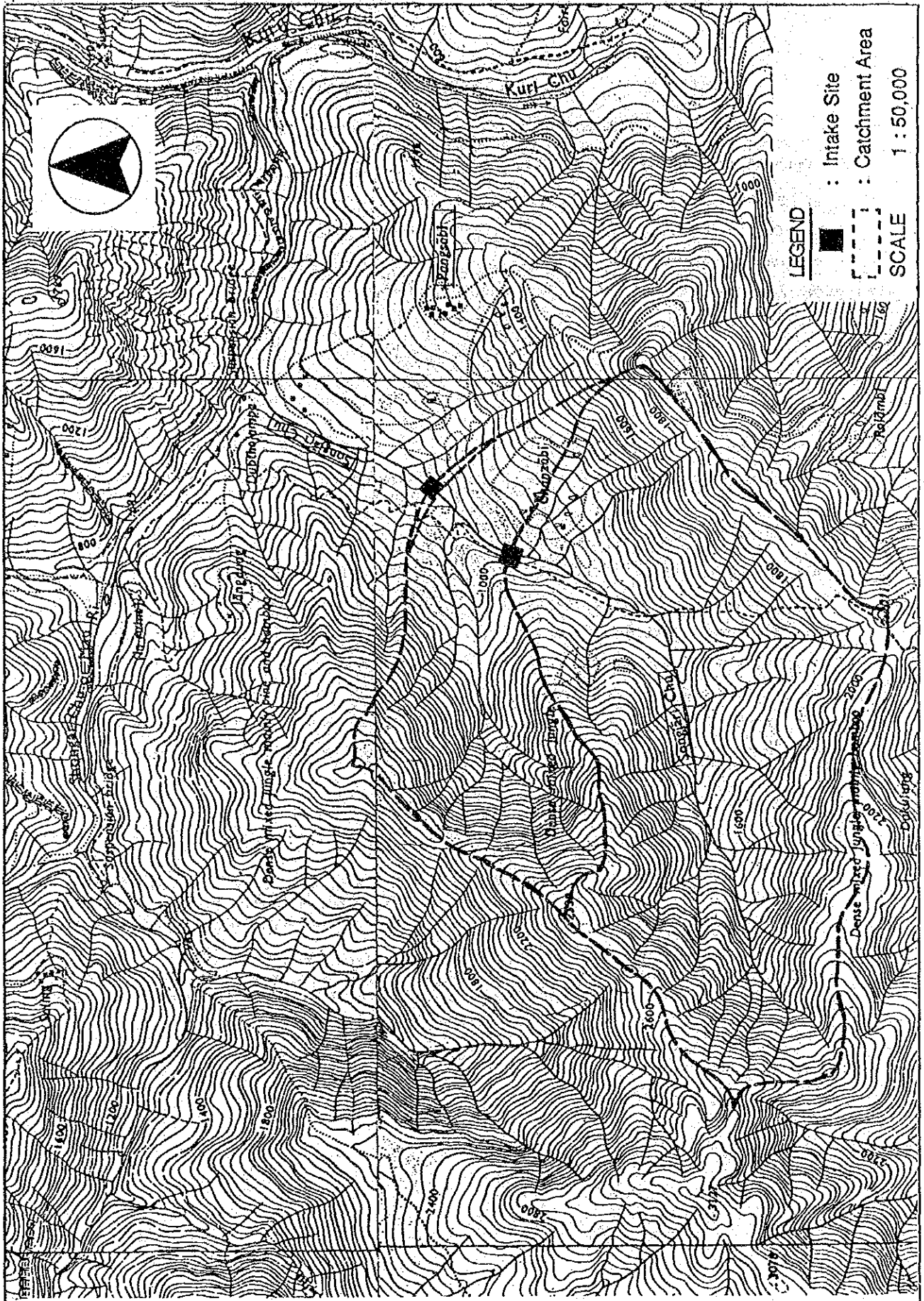
- a) Profile number 10'
- b) Soil name Distric Cambisols
- c) Date of examination January 20, 1988
- d) Location Karibee
- e) Land form:
 - 1. Physiographical On mid-hills at right bank of river Kurichu
 - 2. Surrounding land form Land form is undulating; slopy in shape; adjacent forest with pine trees, lemon grass, etc.
- f) Slope Gently sloping, 5-10% slope
- g) Land use/vegetation Maize crop is grown on dryland, bullock ploughing common.

II. General Information of the Soil:

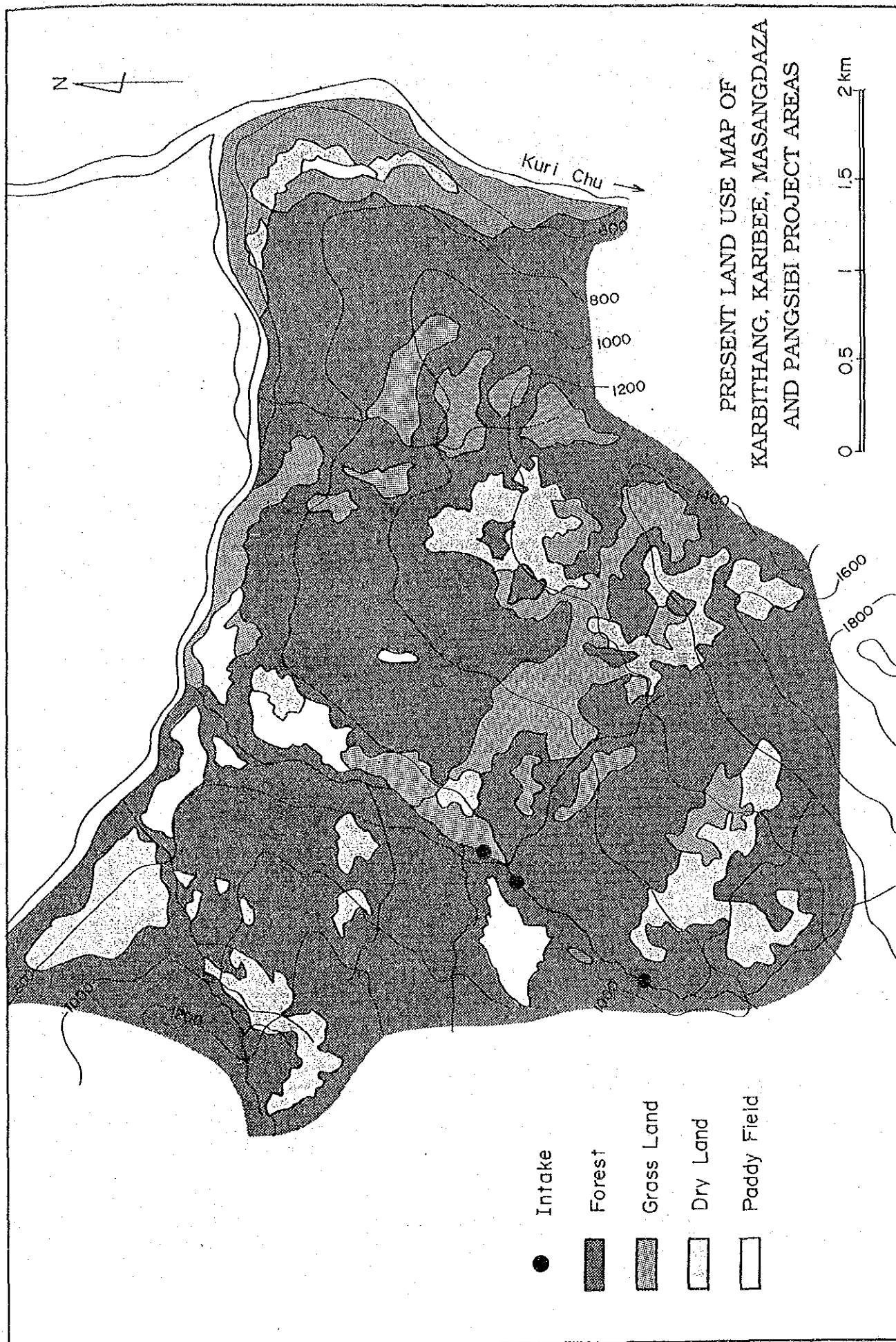
- a) Parent materials Colluvial & alluvial
- b) Drainage Good; well drained
- c) Moisture condition of the site Moderate
- d) Depth of ground water < 1.0 m
- e) Surface stones/rock outcrops Some few are kept at bunds
- f) Erosion Alightly erosion occured; when rains
- g) Human influence The site is cultivated with maize.

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 15	10YR 3/2, brownish black, few, clay loam, 5% -5 to 10 cm, size, weak, granular, fine, slightly sticky, slightly plastic, loose in moist and dry, frequent roots, gravels.
B	15 - 40	10YR 3/2, brownish black, few, sandy loam, 10% large size, weak, subangular blocky size, slightly sticky, slightly plastic, loose when moist and dry, frequent stones present, clear, irregular.
C	40 - 90	10YR 4/6, brown, loamy sand, loose when moist as well as dry, often sand, boulders, etc. present in C horizon, good, permeable.



CATCHMENT AREA AT INTAKE SITE, KARIBEE



11. MASANGDAZA PROJECT AREA

1. Location

- (1) District: Mongar Block: Salling Village: Masangdaza
- (2) Location: 50 minutes by vehicle from district capital through the national road, and 40 minutes walk.

2. Topography

- (1) Elevation: Intake Structure ; (lower) EL 790 m - EL 650 m
Farm Land ; (upper) EL 720 m - EL 950 m
- (2) Slope and Direction of Farm Land
- Slope: 1/4 Direction: North to West

3. Climate and Water Resources

- (1) Climate (Station: Lingmethang)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	23.2	25.3	26.5	29.2	30.7	32.0	31.1	31.6	30.5	29.0	26.2	23.7	28.3
Min	9.0	11.6	14.3	18.3	20.4	24.2	24.1	24.1	22.5	17.3	13.8	10.6	17.5
Average	16.1	18.5	20.4	23.8	25.6	28.1	27.6	27.9	26.5	23.2	20.0	17.2	22.9

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	76.1	75.0	72.2	71.1	72.8	82.3	84.2	80.7	85.4	79.4	78.9	81.4	78.3

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0.5	13.2	49.9	101.8	64.0	187.0	182.7	118.7	187.3	64.0	6.0	9.9	984.8

- (2) Water Resource

- 1) River Name : Shongjari chu
- 2) Catchment Area : 22.00 km² (Lower) 15.20 km² (Upper)
- 3) Length of River : 7.15 km 6.00 km
- 4) Mean Elevation of River : EL 1,795 m EL 1,875 m
- 5) Available Water :

(unit: lit./s)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Mean	365.2	286.0	310.2	468.6	543.4	829.4	1,458.6	1,097.8	1,205.6	602.8	492.8	400.4	671.0
Drought	226.6	209.0	191.4	233.2	345.4	440.0	675.4	517.0	393.8	369.6	352.0	281.6	352.0

Remark: Available water is assessed at lower intake point.

4. Demography

(1) Population

1) Block Population	4,700 (Salling)
2) Project Scheme Population	
a. Population	246 (100%)
	(Male: 59%, Female: 41%)
b. Student (5-14 years)	62 (25%)
c. Labour Force (15-54 Years)	141 (57%)

Age	Male	Female	Total
0 - 4	19	11	30
5 - 9	22	15	37
10 - 14	19	6	25
15 - 19	14	11	25
20 - 24	10	12	22
25 - 29	5	8	13
30 - 34	11	7	18
35 - 39	15	11	26
40 - 44	5	4	9
45 - 49	8	10	18
50 - 54	7	3	10
55 - 59	5	0	5
60 - 64	0	4	4
65 -	4	0	4
Total	144	102	246

3) Share of Population in Block 5%
 * resident only

(2) No. of Household

1) Block	600
2) Project Area	
a) Total	45
- Masangdaza; 37	
- Bongdima; 8	
b) Share of (a) to (1)	8%
3) Average Family Size of the Scheme	5.5

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Masangdaza project area are as follows:

Gleysols	paddy field near the springs, high ground water table.
Cambisols	generally located in paddy field and dry land.
Lithosols/Regosols ..	steep slopes, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

(Unit: ha)

	Wet	Dry	Tsheri	Others	Total
Project Area					
1. Masangdaza					
- Owned by resident	10	36	0	0	46
- Owned by Pangsihi and Karibee farmers	7	5 ¹	0	0	12
2. Bongdima	2	4	0	9 ²	6(9)
Total	19	45	0	(9)	64(9)
					Total 73
Average Holding Size (Resident land only)					
1. Masangdaza (Resident; 37)	0.27	0.97	0	0	1.24
2. Bongdima (Resident; 8)	0.25	0.50	0	0	0.75

¹: Fallow land.

²: Fallow land owned by absent land owner of 11.

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	19	1.5	29
	- Buckwheat	0	0	0
	- Maize	0	0	0
	- Total	19	-	-
2) Dry Land	- Maize	45	1.7	77
	- Wheat	0	0	0
	- Mustard	0	0	0
	- Buckwheat	25	1.0	25
	- Burley	0	0	0
	- Potato	0	0	0
	- Chilli	0	0	0
	- Total	70	-	-
3) Tsheri Land	- Maize	0	0	0
	- Buckwheat	0	0	0
	- Soyabeans	0	0	0
	- Total	0	-	-

(3) Cropping Intensity (%)

- Wet land	100
- Dry land	156
- Tsheri land	-
- Total land (73 ha)	122

(4) Livestock Production

(Unit: head)

	Cattle	Horse	Pig	Poultry
Young	13	3	15	25
Adult	33	10	4	126
Total	46	13	19	151
Average Holding per Household	1.0	0.3	0.4	3.4

7. Irrigation

- (1) Intake: Masangdaza Intake ; Masonry weir, 0.16 m³/sec capacity at EL 919 m
Bongdima Intake ; Random stone fill with log, 0.176 m³/sec capacity at EL 804 m
- (2) Canal: Masangdaza Canal ; Constructed in 1982, 3.3 km long of masonry canal, EL 906 m at canal end
Bongdima Canal ; Constructed in 1984, 4.6 km long of masonry canal, EL 640 m at canal end
- (3) O & M and Necessity of Improvement
 - 1) Intake : No problem on Masangdaza Intake, to be repaired on Bongdima Intake every year
 - 2) Canal : Renovated in 1986, good maintenance, much leakage water in lower part of Bongdima canal
 - 3) Major collapse : 4 places, 50 m long
 - 4) Reasons of collapse : Landslide, collapse and over-topping of canal
- (4) Irrigation
Shortage of water at Bongdima due to lot of leakage water in canal.

8. Rural Facilities

- (1) Access Road and Necessity of Improvement
The foot path necessitates to be widened and the construction of new bridge with small scale.
- (2) Other Public Facilities
Water Supply

9. Farmers' Intension for Development

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Construction of feeder road
- (3) Strengthening of agricultural extension

10. Remarks

Both villages are governmental settlement schemes area commenced in 1981. The lower canal, which distribute the water to Masangdaza and Bongdima areas, has much leakage of water and a considerable amount of water is taken to Animal Husbandary Farm and Public Road Construction Camp for their domestic water at the downstream of the canal.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

- a) Profile number 8
- b) Soil name Eutric Cambisols
- c) Date of examination January 20, 1988
- d) Location Masangdaza; 760 m
- e) Land form Slopy land facing west. Surrounding land form is small stream on the left and steep slope on the right.
- f) Slope Slopy; 5-7%
- g) Land use/vegetation Paddy crops grown on terraces and maize grown on dry fields. Some orange trees, banana trees and some sugarcane also being planted in dry land. Wheat seemed to be minor second crop after paddy in terraced field. Ploughing by bullocks common.

II. General Information of the Soil:

- a) Parent materials Alluvial and colluvial
- b) Drainage Medium, moderate to imperfect.
- c) Moisture condition of the site .. Moist
- d) Depth of ground water > 1 m
- e) Surface stones/rock outcrops Few, some stones present but kept at bund by man
- f) Erosion None at the site due to good terracing. But slight erosion at adjacent right site.
- g) Human influence Very high, crops grown annually such as paddy, maize, wheat, orchards and some vegetables.

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
AI	0 - 14	7.5YR 3/1, brownish black, few, 2.5YR 4/6, distinct, silty and loamy clay, medium, blocky and fine size, sticky and plastic, friable moist, some micro pores, frequent paddy roots, abrupt, medium, after heavy rain water remained for 2 days.
AII	14 - 22	7.5YR 3/4, dark brown, medium, fine, diffuse, silty and loamy clay, massive, blocky, fine, sticky and plastic, friable, diffuse, irregular, medium.
C	22	10YR 5/6, yellowish brown, few, fine size; faint, sandy silty loam, structureless, fine size, sticky and plastic, very friable, weathered rocks and graves present, some clay intrusion also observed.
C2	42	10YR 6/4, dull yellow orange, sandy soil, 40% gravels present, moderate, blocky to angular blocky, medium size, non-sticky and non-plastic, red concretion of 5YR 3/6 present, presence of weathered rocks many, on the whole. This horizon is quite stony.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

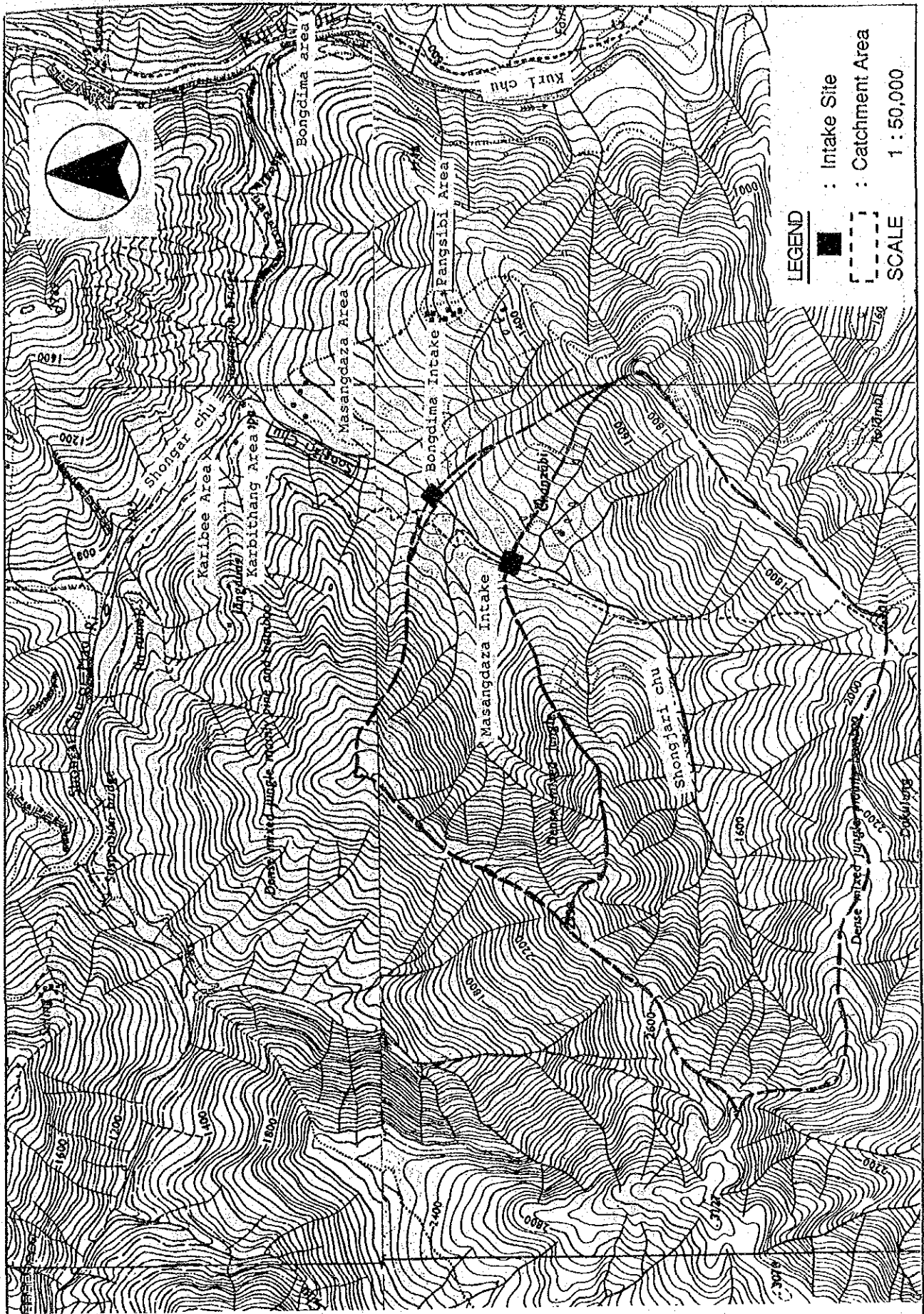
- | | |
|--------------------------------|---|
| a) Profile number | 11 |
| b) Soil name | Cambic Arenosols |
| c) Date of examination..... | January 20, 1988 |
| d) Location..... | Masangdaza (Bongdima) 650 m |
| e) Land form: | |
| 1. Physiographical | Flat land on the right bank of river Kurichhu |
| 2. Surrounding land form | Slopy hillside on the right, river Kurichhu on the left and undulating land on remaining sides. |
| f) Slope | Flat; 1-2% |
| g) Land use/Vegetation | Some parts have paddy field; and rest with maize and soyabean and vegetables. |

II. General Information of the Soil:

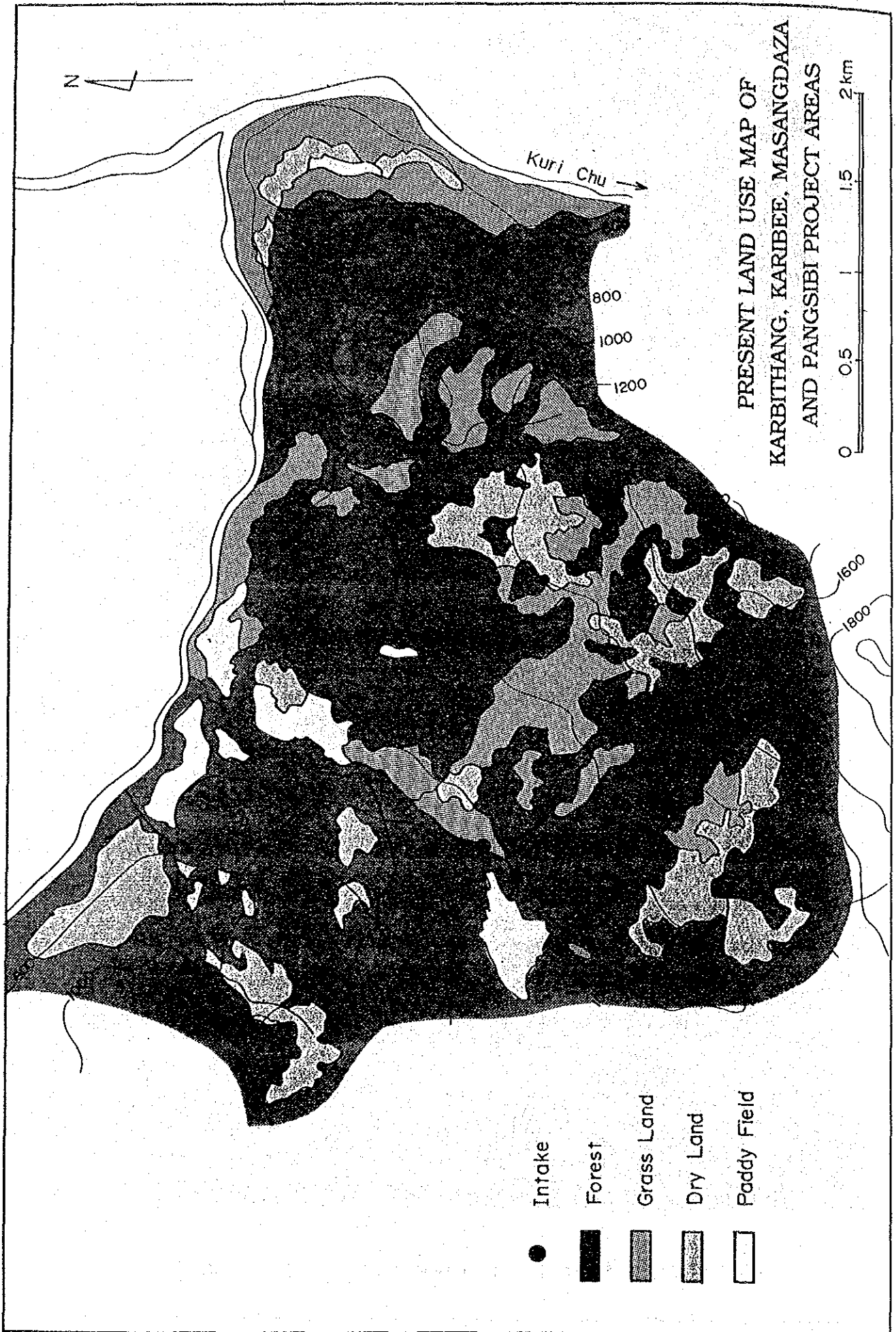
- | | |
|--------------------------------------|--|
| a) Parent material | Alluvial/colluvial |
| b) Drainage | Good |
| c) Moisture condition of the site .. | Slight |
| d) Depth of ground water | < 1 m |
| e) Surface stones/rock outcrops | few |
| f) Erosion | No erosion |
| g) Human influence | Maize and paddy cultivation going on. Few houses also settled at the site. |

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 10	10YR 3/3, dark brown, few, Loamy sand, Structureless, granular, single grain, slightly sticky, slightly plastic and loose in moist and dry condition, frequent grass roots, white fine nodules probably caco3: etc., diffuse and irregular, good, permeable.
B	10 - 50	7.5YR 4/6, brown colour, none, loamy sand, structureless, granular, loose when dry and moist, gravels and boulders, clear and wary.
C	50	7.5YR 5/8, birght brown, none, sand, structureless, granular, loose when moist and dry, some stones, boulders, and gravels present.



CATCHMENT AREA AT INTAKE SITE, MASANGDAZA



12. PANGSIBI PROJECT AREA

1. Location

- (1) District: Mongar Block: Salling Village: Pansibi
- (2) Location: 50 minutes by vehicle from district capital through the national road, and 90 minutes walk from the national road

2. Topography

- (1) Elevation: Intake Structure ; No Intake
Farm Land
- (2) Slope and Direction of Farm Land
- Slope: 1/4 Direction: North to West

3. Climate and Water Resources

- (1) Climate (Station: Lingmethang)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	23.2	25.3	26.5	29.2	30.7	32.0	31.1	31.6	30.5	29.0	26.2	23.7	28.3
Min	9.0	11.6	14.3	18.3	20.4	24.2	24.1	22.5	17.3	13.8	10.6	17.5	17.5
Average	16.1	18.5	20.4	23.8	25.6	28.1	27.6	27.9	26.5	23.2	20.0	17.2	22.9

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	76.1	75.0	72.2	71.1	72.8	82.3	84.2	80.7	85.4	79.4	78.9	81.4	78.3

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0.5	13.2	49.7	101.8	64.0	187.0	182.7	118.7	187.3	64.0	6.0	9.9	984.8

- (2) Water Resource: No Intake

4. Demography

- (1) Population

- 1) Block Population 4,700 (Salling)
- 2) Project Scheme Population
- a. Population 74 (100%)
(Male: 47%, Female: 53%)
- b. Student (5-14 years) 21 (28%)
- c. Labour Force (15-54 Years) 35 (47%)

Age	Male	Female	Total
0 - 4	3	2	5
5 - 9	3	6	9
10 - 14	7	5	12
15 - 19	2	6	8
20 - 24	7	1	8
25 - 29	1	2	3
30 - 34	0	0	0
35 - 39	1	2	3
40 - 44	2	0	2
45 - 49	1	5	6
50 - 54	2	3	5
55 - 59	3	3	6
60 - 64	1	2	3
65 -	2	2	4
Total	35	39	74

- 3) Share of Population in Block 2%
- (2) No. of Household
- 1) Block 600
- 2) Project Area
- a) Total 21
- b) Share of (a) to (1) 4%
- 3) Average Family Size of the Scheme 3.5

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil unit in the Pangsibi project area is as follows:

Cambisols generally situated in dry land and grass land.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet ^{/1}	Dry	Tsheri	Others	Total
Project Area	(5)	21	1	0	22(5)
Average Holdg Size	(0.23)	1.00	(0.05)	0	1.05(0.23)

^{/1}: Wet land is in Masangdaza project area.

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	(5)	(1.5)	(7)
	- Buckwheat	0	0	0
	- Maize	0	0	0
	- Total	0	-	-
2) Dry Land	- Maize	21	2.0	42
	- Wheat	0	0	0
	- Mustard	0	0	0
	- Buckwheat	0	0	0
	- Barley	0	0	0
	- Potato	0	0	0
	- Chilli	0	0	0
	- Total	21	-	-
3) Tsheri Land	- Maize	0.4	2.0	0.8
	- Buckwheat	0	0	0
	- Soyabans	0	0	0
	- Total	0.4	-	-

(3) Cropping Intensity (%)

- Wet land	(100)
- Dry land	100
- Tsheri land	40
- Total land (27 ha)	98

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	98	11	40	84
Adult	211	16	11	34
Total	309	27	60	118
Average Holding per Household	14.7	1.3	2.9	5.6

7. Irrigation

No irrigation facility exists. No possibility is for new irrigation scheme due to no water resource for the area.

8. Rural Facilities

(1) Access Road and Necessity of Improvement

The food path with steep slope runs along the mountain ridges and is passable only on foot or by horse. It needs the renovation owing to the much exposure of rocks and the existence of muds.

(2) Other Public Facilities

Water Supply

9. **Farmers' Intension for Development**

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Construction of feeder road
- (3) Strengthening of agricultural extension

10. **Remarks**

A part of farmers proceeds to Masangdaza area for their cultivation works.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

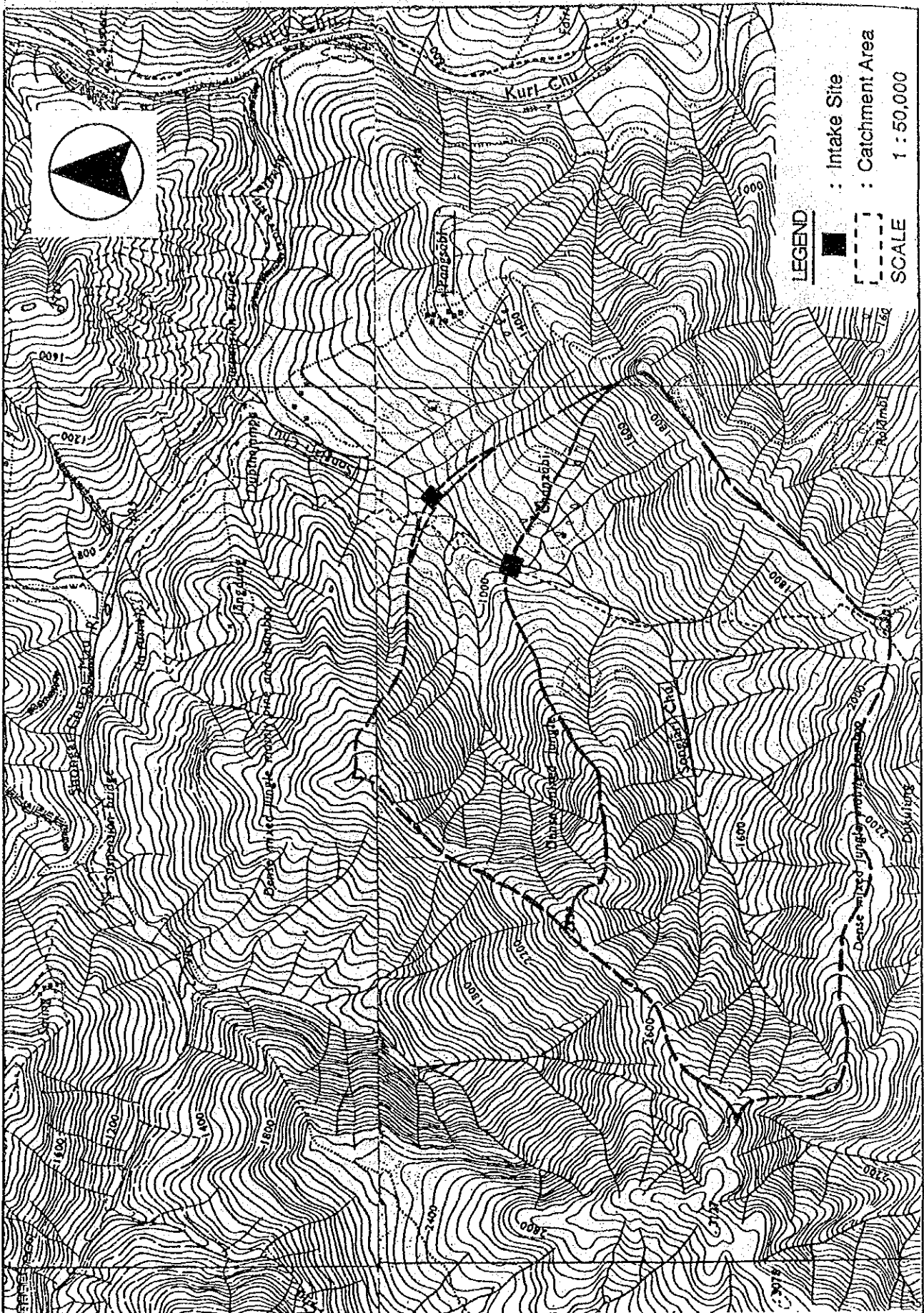
- | | |
|--------------------------------|--|
| a) Profile number | 12 |
| b) Soil name | Cambic Arenosols |
| c) Date of examination | January 23, 1988 |
| d) Location | Pangsibi, 1,300 m |
| e) Land form: | |
| 1) Physiographical | Located almost on the top of the hill; some masangdaza |
| 2) Surrounding land form | Undulating, hillside one one side and slopy on the other |
| f) Slope | Gently slope: 2-3% |
| g) Land use/vegetation | Kitchen garden, radish |

II. General Information of the Soil:

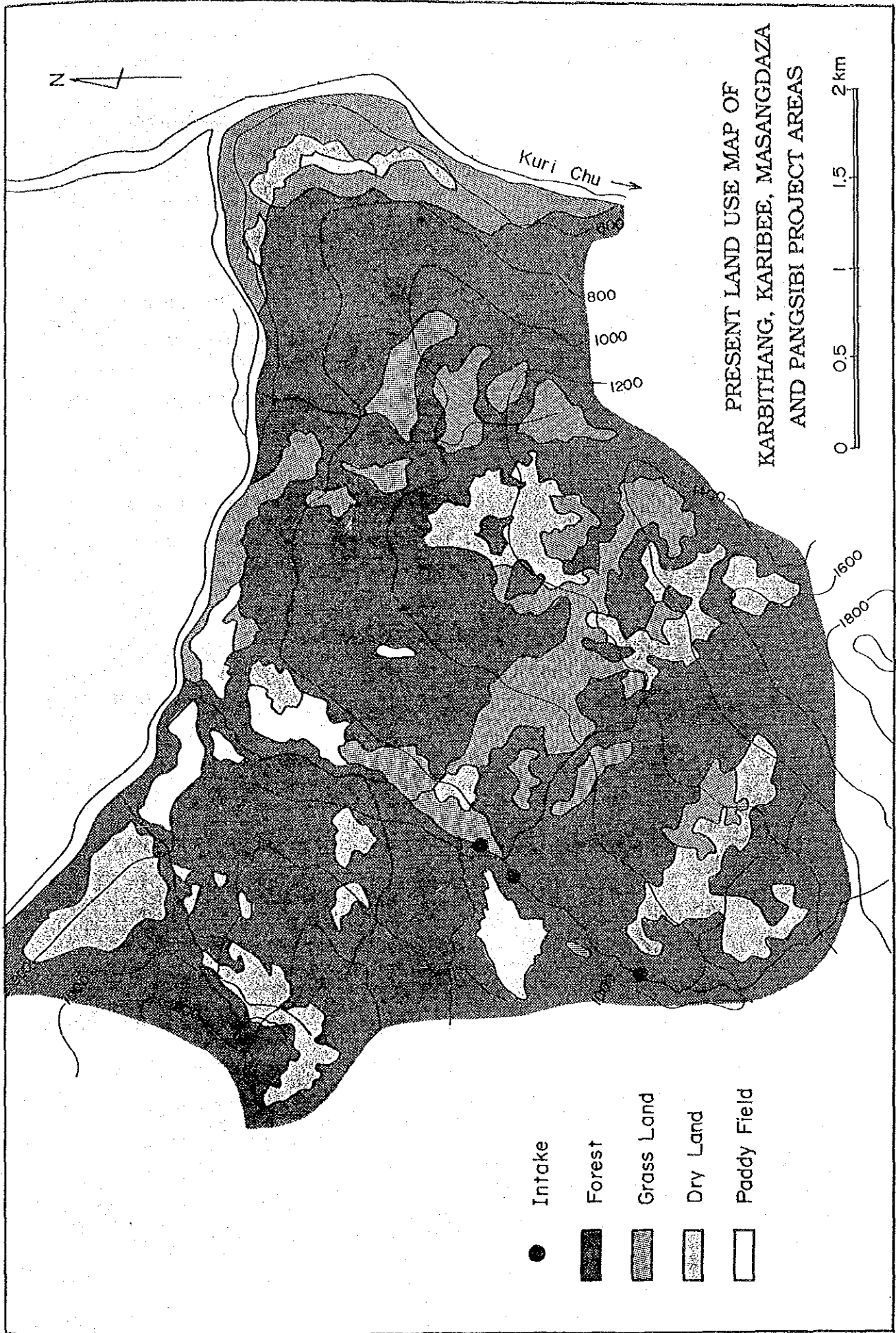
- | | |
|--------------------------------------|-------------------------------|
| a) Parent material | Alluvial |
| b) Drainage | Good; well drained |
| c) Moisture condition of the site .. | Moist |
| d) Surface stones/rock outcrops | Few at site |
| e) Erosion | None/not affected |
| f) Human influence | Cultivated, bullock ploughing |

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 7	10YR 5/3, dull yellowish brown, few, loamy clay, 5% particle 2-5 cm size, weak, granular, single grain and of fine size, slightly stickys, slightly plastic, loose when dry and moist, some gravels, frequent roots, fine charcoal particles, gradual, wary, moderate to slow.
B	7 - 15	2.5YR 3/2, brownish black, common, fine and distinct, loamy clay, 5-10/2-5 cm size, weak, granular, single grain and of fine size, slightly sticky, slightly plastic, loose when dry, some gravels, frequent roots, some charcoal particles, moderate to slow.
C - C1	15 - 42	7.5YR 5/8, bright brown, few to common, fine, distinct, sandy clay, weak, angular blocky, medium size, sticky, plastic, friable when moist, irequent stones, gravels some charcoal, clay angular, 2.5YR 3/2 coloured, moderate to slow.



CATCHMENT AREA AT INTAKE SITE, PANGSIBI



13. GYELPOSHING PROJECT AREA

1. Location

- (1) District: Mongar Block: Mongar Village: Gyelposhing
- (2) Location: 40 minutes by vehicle from district capital through the national road, and 45 minutes by vehicle from the national road.

2. Topography

- (1) Elevation: Intake Structure ; EL 730 m (EL 520 m)
Farm Land ; EL 480 m (EL 580 m)
- (2) Slope and Direction of Farm Land
- Slope: 1/5 Direction: West to South

3. Climate and Water Resources

- (1) Climate (Station: Tangmachhu)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	23.2	25.3	26.5	29.2	30.7	32.0	31.1	31.6	30.5	29.0	26.2	23.7	28.3
Min	9.0	11.6	14.3	18.3	20.4	24.2	24.1	24.1	22.5	17.3	13.8	10.6	17.5
Average	16.1	18.5	20.4	23.8	25.6	28.1	27.6	27.9	26.5	23.2	20.0	17.2	22.9

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	76.1	75.0	72.2	71.1	72.8	82.3	84.2	80.7	85.4	79.4	78.9	81.4	78.3

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0.5	13.2	49.7	101.8	64.0	187.0	182.7	118.7	187.3	64.0	6.0	9.9	984.8

- (2) Water Resource

- 1) River Name : Drodi ri
- 2) Catchment Area : 13.88 km²
- 3) Length of River : 6.55 km
- 4) Mean Elevation of River : EL. 1,615 m
- 5) Available Water :

(unit: lit./s)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Mean	230.4	180.4	195.7	295.6	342.8	523.3	920.2	692.6	760.6	380.3	310.9	252.6	423.3
Drought	143.0	131.9	120.8	149.1	217.9	277.6	426.1	326.2	248.5	233.2	222.1	177.7	222.1

4. Demography

(1) Population

- 1) Block Population 9,400 (Mongar)
- 2) Project Scheme Population
 - a. Population 798 (100%)
(Male: 49%, Female: 51%)
 - b. Student (5-14 years) 245 (31%)
 - c. Labour Force (15-54 years) 385 (48%)

Age	Male	Female	Total
0 - 4	49	35	84
5 - 9	77	77	154
10 - 14	14	77	91
15 - 19	56	35	91
20 - 24	14	7	21
25 - 29	21	21	42
30 - 34	28	28	56
35 - 39	0	35	35
40 - 44	42	7	49
45 - 49	35	35	70
50 - 54	14	7	21
55 - 59	7	14	21
60 - 64	14	7	21
65 -	21	21	42
Total	392	406	798

- 3) Share of Population in Block 8%
(* Included other villagers)

(2) No. of Household

- 1) Block 1,270
- 2) Project Area
 - a) Total 69
 - b) Share of (a) to (1) 5%
- 3) Average Family Size of the Scheme 11.6

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Gyelposhig project area are as follows:

- Cambisols generally located in paddy field and dry land.
- Arenosols generally located in paddy field and dry land.
- Lithosols/Regosols ... steep slopes, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet	Dry	Tsheri	Others	Total
Project Area	38	4	0	0	42
Average Holdg Size	0.55	0.06	0	0	0.61

(2) Agricultural Production

	Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land			
- Paddy	21	1.0	21
- Buckwheat	1	0.7	1
- Maize	0	0	0
- Total	22	-	-
2) Dry Land			
- Maize	4	1.5	6
- Wheat	0	0	0
- Mustard	0	0	0
- Buckwheat	0	0	0
- Barley	0	0	0
- Potato	0	0	0
- Chilli	1	0.5	0.5
- Total	5	-	-
3) Tsheri Land			
- Maize	0	0	0
- Buckwheat	0	0	0
- Soyabeans	0	0	0
- Total	0	-	-

(3) Cropping Intensity (%)

- Wet land	58
- Dry land	125
- Tsheri land	-
- Total land	64

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	76	2	7	120
Adult	231	25	43	225
Total	307	27	50	345
Average Holding per Household	4.4	0.4	0.7	5.0

7. Irrigation

- (1) Intake: Random stone fill weir, 0.149 t/sec capacity at EL 730 m
- (2) Canal: Constructed in 1979, renovated in 1982, 3.7 km long of all masonry canal, EL 520 m at canal end

(3) O & M and Necessity of Improvement

- 1) Intake : Temporary facilities are repaired every year. It is very hard to construct permanent structure because it is located at land collapsed area.
- 2) Canal : About 100 m of upper part of canal is temporary due to unstable ground condition.
- 3) Major collapse : 3 places, 100m long
- 4) Reasons of collapse : Over-topping of canal

(4) Irrigation

Development of paddy incompleting due to shortage of irrigation water.

8. Rural Facilities

(1) Access Road and Necessity of Improvement

The road is passable by vehicle, however, much deteriorated and scheduled to be a asphalt pavement road which reaches India along Kuri chu.

(2) Other Public Facilities

Water Supply, Grocer

9. Farmers' Intension for Development

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Strengthening of agricultural extension
- (3) Improvement of soil condition

10. Remarks

- (1) This is the governmental settlement scheme area commenced in 1981, however, most of farmers abandon the farming due to the shortage of irrigation water.
- (2) Out of 69 Nos. of relevant farmers, 40 Nos. of farmers come to this area from adjacent area.
- (3) This area has the shortage of irrigation water in drought year owing to the existence of three intake structures upstream of water resource.
- (4) Intake site must be shifted (about 100m) upstream where is considered the stable place topo-geologically, assessing the reliability of water resource.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

- a) Profile number 3
- b) Soil name Dystric Cambisols
- c) Date of examination January 20, 1988
- d) Location Gyelposhing (1/5), elevation 525 m
- e) Land form:
- 1) Physiographical position flat land
- 2) Surrounding land form Surrounded by hill on the east and by Kuri chu on the west side
- f) Slope 2-3 %
- g) Land use/vegetation Paddy field, monocrop of rice grown every yearf fallow during winter

II. General Information of the Soil:

- a) Parent material Alluvial deposit
- b) Drainage Good
- c) Moisture condition Dry to moist
- d) Permeability Good
- e) Depth of groundwater > 1 m (may be more than 5 m)
- f) Surface stones/rock outcrop Some rock outcrops, many at adjacent fields
- g) Erosion Almost nil
- h) Human influence Original soil disturbed by terracing; annual ploughing at top layer (12 cm); generally wooden ploughs are used by bullocks

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 12	Dull yellowish brown (10YR 5/3); few fine size and faint mottle; sandy loam; medium weak granular; angular blocky and subangular blocky; non-sticky; slightly plastic (wet); slightly hard (dry); some grasses and paddy roots of and other grasses present; some micas flakes; gradual and irregular boundary.
B	12 - 25	Brown (10YR 4/6); common; fine and distinct mottle; sand silts to loamy sand; medium weak to moderate angular blocky sub-angular blocky and platy; sightly sticky and slightly plastic (wet); slightly hard (dry); few grass roots; Mn deposits; gradual irregular boundary.
c	25 - (90)	Brown (10YR 4/6); few; fine and faint mottle; sandy soil; atructureless; non-sticky; slightly plastic (wet) slightly hard (dry); atony; no roots.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

- a) Profile number 4
- b) Soil name Distric Cambisols
- c) Date of examination January 20, 1988
- d) Location Gyelposing (2/5), elevation 550 m
- e) Land form:
1. Physiographical position Flat terraced field
 2. Surrounding land form Rolling hill on left and river Kurichu on right
- f) Slope 2-3 %
- g) Land use/vegetation Rice cultivation only once in a year during summer

II. General Information of the Soil:

- a) Parent material Alluvium mterial
- b) Drainage Good, well drained
- c) Moisture condition of the site Slightly moist
- d) Depth of groundwater < 1 m (estimate much more)
- e) Permeability Good
- f) Surface stones/rock out crops Surface stones many but collected at the bund during terracing. Some big rock outcrops invisible, specially on right side of the pit.
- g) Erosion Almost nil at the site
- h) Human influence Original soil profile disturbed while making terraces. The plough layer annually disturbed during cultivation period.

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 24	Brown (10YR 4/4); many fine distinct mottle (10YR 5/8); clay loam to loamy clay; weak blocky and subangular blocky medium structure; slightly sticky; slightly plastic (wet); paddy roots abundant; clear wavy boundary.
B	24 - 43	Bright yellowish brown (10YR 6/8); silt loam; few medium distinct mottle; weak blocky to sub-angular blocky medium and coarse structure; slightly sticky and slightly plastic; rich in mica and quarts; few Ca deposit; few roots; gradual weak boundary.
C	43 - 100	Orange (7.5 YR 6/6); none mottle; sandy loam; fine blocky to angular blocky structure; slightly sticky; non-plastic; few roots; few nodles.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

- a) Profile number 5
- b) Soil name Cambic Arenosols
- c) Date of examination January 20, 1988
- d) Location Gyelposing (3/5), elevation 530 m
- e) Land form:
 - 1. Physical position Flat, slightly undulating
 - 2. Surrounding land form Cultivated field at the left side and river Kurichu on the right
- f) Slope 1-3 %
- g) Land use/vegetation Very old paddy field but abandoned for many years. Presently grassland mainly lemon grass and some busky plants.

II. General Information of the Soil:

- a) Parent material Alluvium material
- b) Drainage Good; well drained
- c) Moisture condition of the site ... Moderately dry to dry
- d) Depth of groundwater <100 cm (or may be much); unknown
- e) Permeability Good, highly permeable
- f) Surface stones/rock outcrops Some fairly rocky, some rock outcrops, boulders present
- g) Erosion None
- h) Human influence Presently none. Sometimes land used for cattle grazing purpose only. No ploughing so far.

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 18	Dark brown (10YR 3/4); silty sand; few mottle; moderate blocky and platy fine structure; non-sticky; slightly plastic (wet); loose when moist; looose when dry; few micro-pores; some fine roots; clear irregular boundary.
B	18 - 45	Dark brown (10YR 3/6); silty sand; few mottle; sand; large particles 5 mm few; structureless; non-sticky; slightly plastic; loose in moist and dry; Mn concretion; clear wavy boundary.
C	45 -	Brown 10YR 4/6 (10YR 4/6); few mottles; 2 to 15 mm particle 7%; structureless; non-sticky; non plastic (wet); loose when moist and dry; gravelly; stomy; sandy layer intercepts.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

- a) Profile number 6
- b) Soil name Cambic Arenosols
- c) Date of examination Jauary 20, 1988
- d) Location Gyelposhing (4/5), elevation 560
- e) Land form:
 - 1. Physiographical position Flat
 - 2. Surrounding land form Cultivated field and steep slopy land, where Depong stream flows
- f) Slope 0-1 %, very gentle
- g) Land use/vegetation Old paddy field, and now using only as pasture land
- h) Erosion Almost nil

II. General Information of the Soil:

- a) Parent material Alluvial source
- b) Drainage Good, well drained
- c) Moisture condition Dry
- d) Depth of groundwater < 1 m
- e) Permeability Good
- f) Surface stones/rock outcrops Few stones and few rock outcrops in adjacent field
- g) Erosion Evidence of erosion almost nil
- h) Human influence Initially land was tarraced but due to stoniness and poor soil facility, not cultivated at present. The site is just being used pasture field only.

III. Profile Description:

(Horizon)	(Depth) (cm)	Description
A	0 - 11	Dull yellowish brown (10YR 5/3); loamy sand; few mottle; 2-5 mm 5%, loose gramular and single grain very fine to fine structure; , slightly sticky; slightly plastic; loose (moist and dry); some fine gravels 2 to 5 mm 5 %; diffuse and broken boundary.
B	11 - 31	Yellowish brown (10YR 5/6); sandy; few mottle; 5-10 mm 70-80%; loose gramular and single grain very fine to fine structures; non-sticky; non plastic; lose (moist and dry); fine gravels 2 to 10 mm 70 to 80 %.
C	31 -	Yellowish brown (10YR 5/6); sand; few mottle; loose gramunlar and single grain very fine structure; non-sticky; non-plastic; loose (moist and dry); big stone and boulders 90 %.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

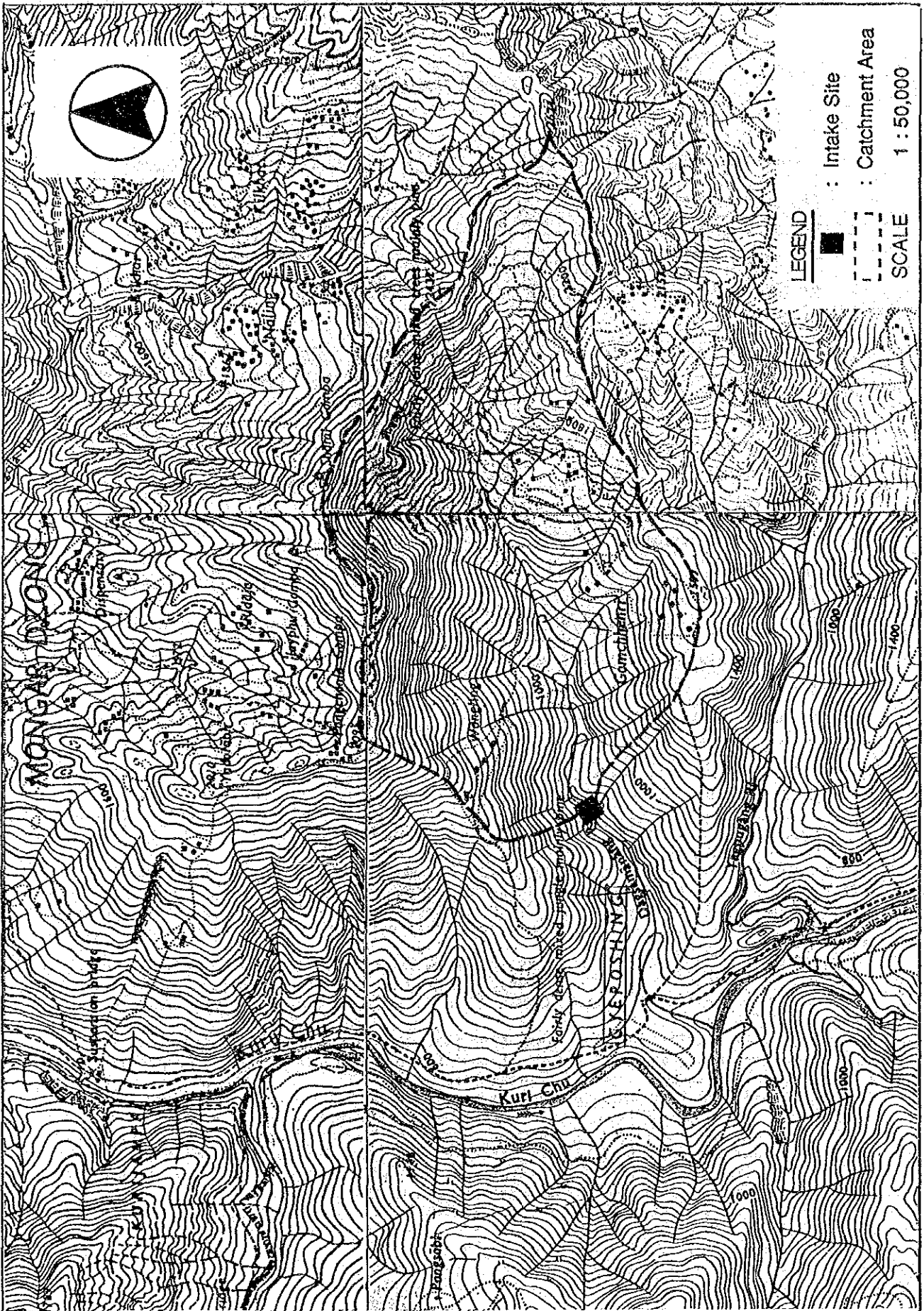
- a) Profile number 7.
- b) Soil name Cambic Arenosols
- c) Date of examination January 20, 1988
- d) Location Gyelposing (5/5), 580 m
- e) Land form:
 - 1. Physiographical Alluvial terrace
 - 2. Surrounding land form Flat, slightly undulating
- f) Slope 2-3%
- g) Land use/vegetation Pasture, old paddy field

II. General Information of the Soil:

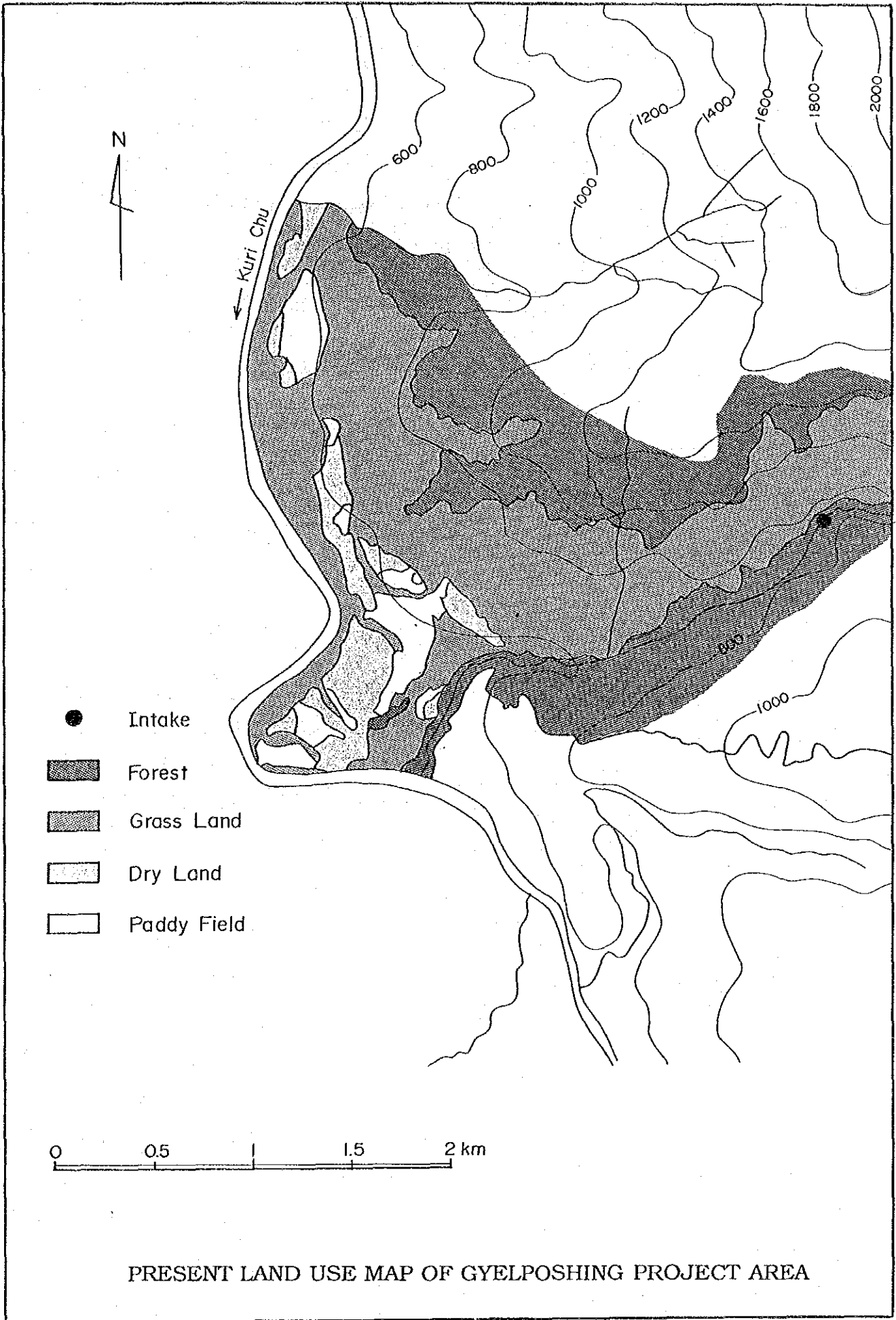
- a) Parent materials Alluvial
- b) Drainage Very good, well drained
- c) Moisture condition in profile ... dry
- d) Depth of ground water > 5 m
- e) Surface stones/rock outcrops Few
- f) Erosion None at the site
- g) Human influence Cultivated earlier, but abandoned since 5 years due to too sandiness.

III. Profile Description:

(Horizon)	(Depth) (cm)	Description
O	0 - 22	10YR 5/3, few, dull yellowish brown, loamy sand, structureless, blocky, granular, singel grain, non-sticky plastic when wet, non-plastic when dry, few, some pebbles, few grass roots, diffused, very permeable.
B	22 - 23	10YR 3/3, dark brown, few, loamy sand, structureless, non-sticky, slightly plastic (wet), few grass roots, gradual, high.
C	32	10YR 6/8, yellow Brown, few, sandy, structureless, weak, non-sticky, non plastic, some small stones, diffused, permeable.
C2	42	10YR 6/4, dull yellow orange, sandy soil, 40 % gravels present, moderate, blocky to angular blocky, medium size, non-sticky and non-plastic, red concretion of 5YR 3/6 present, pressure of weathered rocks many, on the whole. This horizon is quite stony.



CATCHMENT AREA AT INTAKE SITE, GYELPOSHING



PRESENT LAND USE MAP OF GYELPOSHING PROJECT AREA

14. KALAPANG PROJECT AREA

1. Location

- (1) District: Mongar Block: Salling Village: Kalapang
- (2) Location: 40 minutes by vehicle from district capital through the national road, and 150 minutes walk, crossing two tributaries by log bridge or directly and Kurichu by suspension bridge, from Gyelposhing project area.

2. Topography

- (1) Elevation: Intake Structure ; No Intake
Farm Land ; EL 900 m EL 1,000 m
- (2) Slope and Direction of Farm Land
Slope: 1/3 Direction: North

3. Climate and Water Resources

- (1) Climate (Station: Lingmethang)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	23.2	25.3	26.5	29.2	30.7	32.0	31.1	31.6	30.5	29.0	26.2	23.7	28.3
Min	9.0	11.6	14.3	18.3	20.4	24.2	24.1	24.1	22.5	17.3	13.8	10.6	17.5
Average	16.1	18.5	20.4	23.8	25.6	28.1	27.6	27.9	26.5	23.2	20.0	17.2	22.9

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	76.1	75.0	72.2	71.1	72.8	82.3	84.2	80.7	85.4	79.4	78.9	81.4	78.3

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0.5	13.2	49.7	101.8	64.0	187.0	182.7	118.7	187.3	64.0	6.0	9.9	984.8

- (2) Water Resource : No intake

4. Demography

- (1) Population

- 1) Block Population 4,700 (Salling)
- 2) Project Scheme Population
- a. Population 125 (100%)
(Male: 50%, Female: 50%)
- b. Student (5-14 years) 39 (31%)
- c. Labour Force (15-54 Years) 62 (50%)

Age	Male	Female	Total
0 - 4	9	4	13
5 - 9	10	13	23
10 - 14	8	8	16
15 - 19	6	7	13
20 - 24	5	6	11
25 - 29	6	3	9
30 - 34	4	6	10
35 - 39	2	1	3
40 - 44	4	5	9
45 - 49	2	4	6
50 - 54	0	1	1
55 - 59	1	1	2
60 - 64	3	0	3
65 -	3	3	6
Total	63	62	125

- 3) Share of Population in Block 3%
- (2) No. of Household
- 1) Block 600
- 2) Project Area
- a. Total 10
- b. Share of (a) to (1) 2%
- 3) Average Family Size of the Scheme 12.5

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Kalapang project area are as follows:

Cambisols generally located in dry land.

Arenosols generally located and dry land.

Lithosols/Regosols .. steep slopes, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet	Dry	Tsheri	Others	Total
Project Area	0.4	9	5	0	14.4
Average Holdg Size	0.04	0.90	0.50	0	1.44

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	0.4	1.6	0.6
	- Wheat	0	0	0
	- Maize	0	0	0
	- Total	0.4	-	-
2) Dry Land	- Maize	9	2.1	19
	- Wheat	0	0	0
	- Mustard	0	0	0
	- Buckwheat	2	1.0	2
	- Barley	0	0	0
	- Potato	0	0	0
	- Chilli	0	0	0
	- Total	11	-	-
3) Tsheri Land	- Maize	3	2.1	6
	- Buckwheat	0	0	0
	- Soyabans	0	0	0
	- Total	3	-	-

(3) Cropping Intensity (%)

- Wet land	100
- Dry land	122
- Tsheri land	60
- Total land	100

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	20	-	5	20
Adult	63	-	15	50
Total	83	-	20	70
Average Holding per Household	8.3	-	2.0	7.0

6. Irrigation

The construction works of new irrigation scheme is interrupted after commenced in 1987 due to unfarable site conditions. The resumption of the works can't be expected.

7. Rural Facilities

(1) Access Road and Necessity of Improvement

The foot path is passable only on foot or by horse and necessitates the renovation owing to many collapsed places and muds in rainy season between Gyelposhing project area and suspension bridge on Kuri chu.

(2) Other Public Facilities

Water Supply

8. **Farmers' Intension for Development**

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Strengthening of agricultural extension
- (3) Expansion of farm land

9. **Remarks**

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

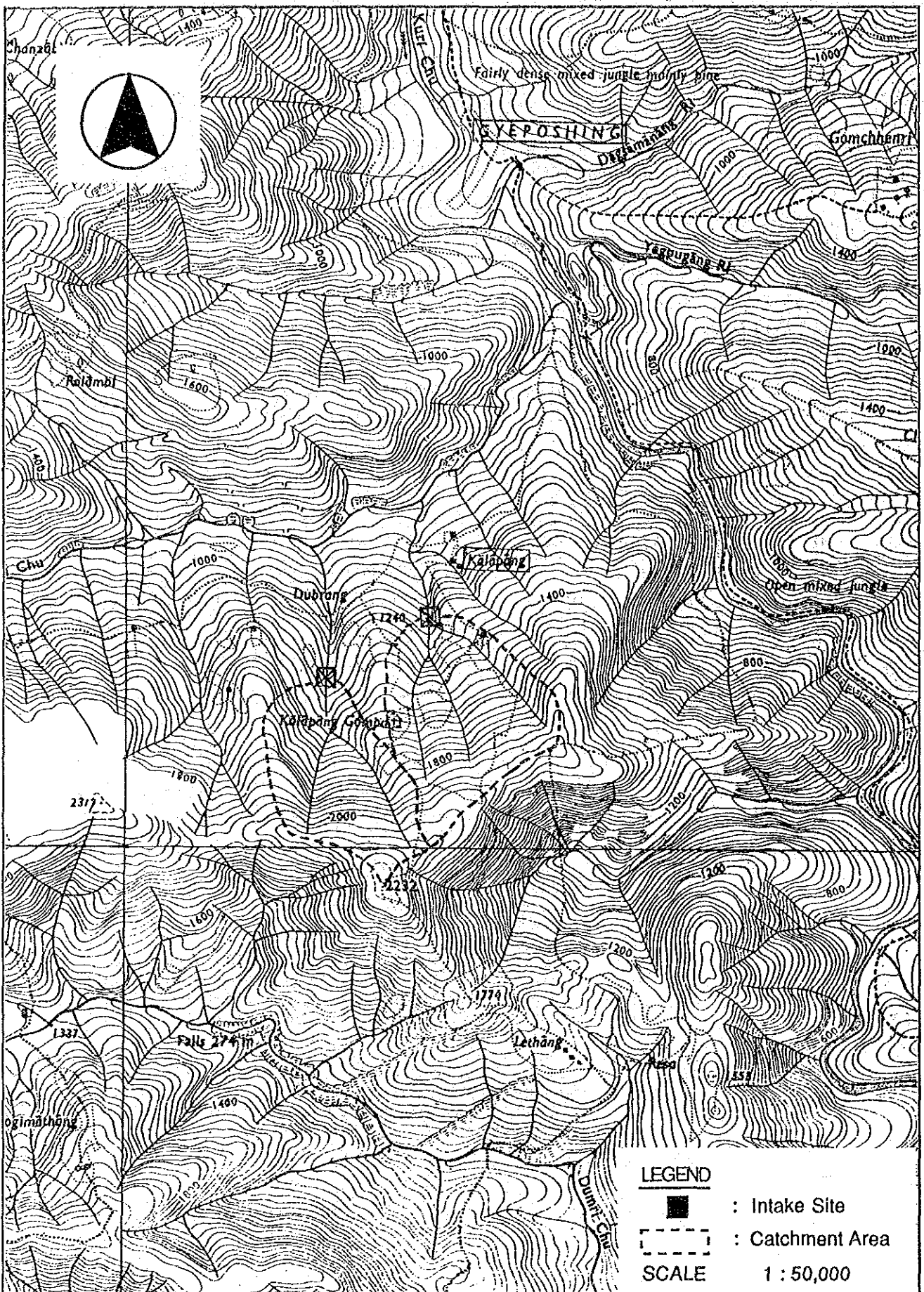
- a) Profile number 23
- b) Soil name Dystric Cambisols
- c) Date of examination February 5, 1988
- d) Location Kalapang, 880 m
- e) Land form:
 - 1) Physiographical Gently sloping field
 - 2) Surrounding area Gently sloping field
- f) Slope Gently slope; 4 -6 %
- g) Land use/vegetation upland field: maize

II. General Information of the Soil:

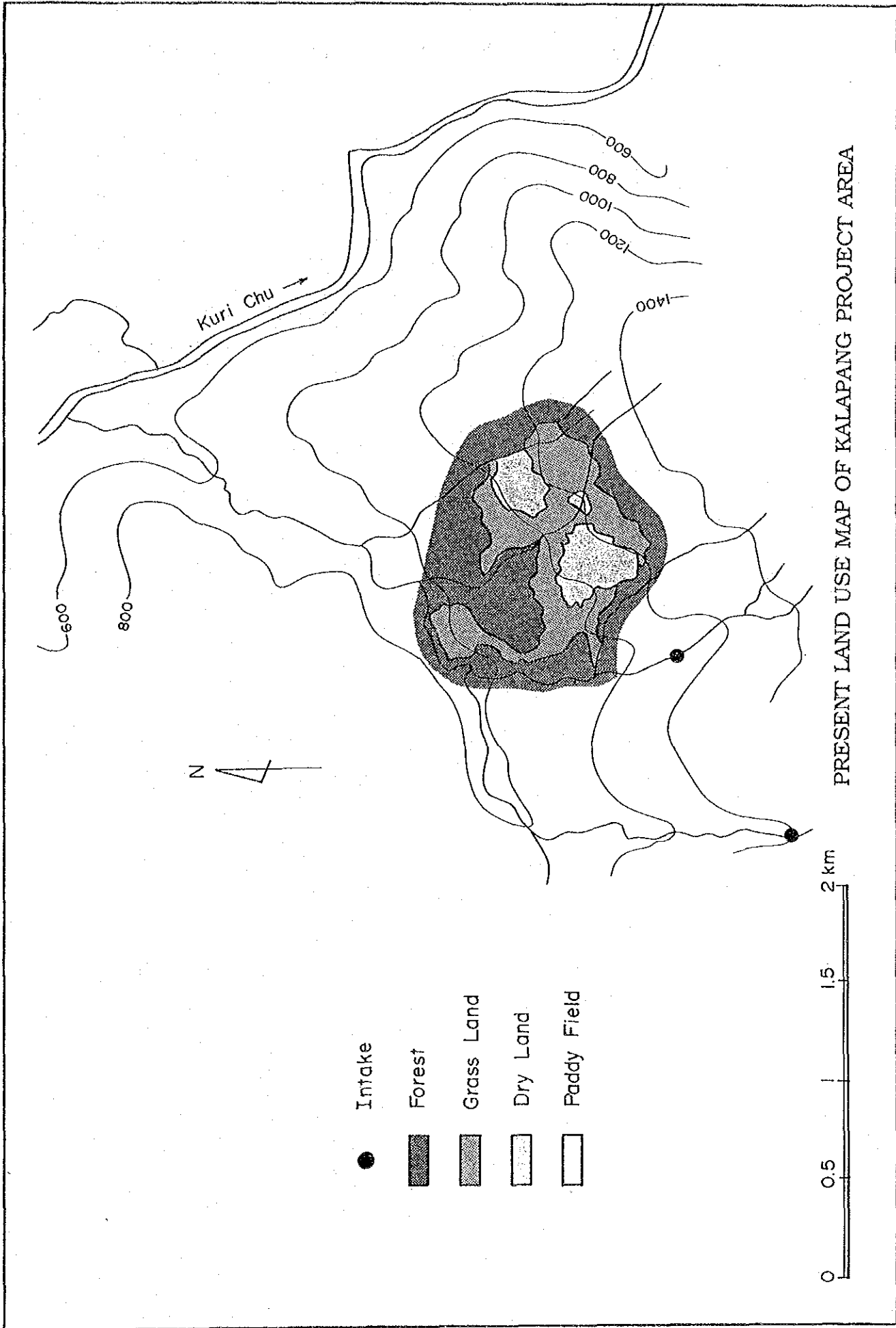
- a) Parent material Colluvial
- b) Drainage Good; well drained
- c) Moisture condition of site Dry in upper part, moist in lower part
- d) Ground water depth < 100 cm
- e) Surface stones/rock outcrops None, but some are around
- f) Erosion slight
- g) Human influence cultivated

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 16	Dark brown (10YR 5/3) dry; loamy clay; few mottle; weak granular fine to very fine structure; slightly sticky; slightly plastic; loose when moist; loose when dry; common grass roots; weathered stone 20 to 50 mm 85 %; diffuse irregular boundary.
B	16 - 61	Dark brown (10YR 3/3) moist; loamy clay; few mottle; weak granular fine to very fine structure; slightly sticky; slightly plastic; loose when moist; loose when dry; few grass roots; weathered stone 5 to 30 mm 95 %; diffuse irregular boundary.
C1	61 -	Dull yellowish brown (10YR 5/8) moist; loamy clay; few mottle; weak granular fine structure; slightly sticky; slightly plastic; loose when moist; loose when dry; weathered stone 5 to 50 mm 70 %.



CATCHMENT AREA AT INTAKE SITE, KALAPANG



15. YADI PROJECT AREA

1. Location

- (1) District: Mongar Block: Ngatshang Village: Yadi
- (2) Location:

2. Topography

- (1) Elevation: Intake Structure ; EL 1,580 m - EL 1,490 m
 Farm Land ; EL 1,080 m - EL 1,500 m

- (2) Slope and Direction of Farm Land

Slope: 1/4 Direction: North to West

3. Climate and Water Resources

- (1) Climate (Station: Yadi)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	16.6	17.3	20.1	23.0	24.5	26.2	25.1	26.2	24.9	23.2	20.0	17.3	22.0
Min	10.0	9.5	11.8	14.5	16.5	19.9	19.8	19.8	18.9	14.3	9.9	8.7	14.5
Average	13.3	13.4	15.9	18.8	20.5	23.1	22.5	23.0	21.9	18.8	15.0	13.0	18.2

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	66.7	70.2	62.3	70.0	74.5	81.0	89.0	85.7	87.6	79.7	70.1	72.2	75

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0	5.9	39.1	77.9	69.4	130.5	206.6	125.5	135.4	43.8	7.5	8.6	850.1

- (2) Water Resource

- 1) River Name : Seri chu
- 2) Catchment Area : 2.03 km²
- 3) Length of River : 1.65 km
- 4) Mean Elevation of River : EL. 1,965 m
- 5) Available Water :

(unit: lit./s)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Mean	33.7	26.4	28.6	43.2	50.1	76.5	134.6	101.3	111.2	55.6	45.5	36.9	61.9
Drought	20.9	19.3	17.7	21.5	31.9	40.6	62.3	47.7	36.3	34.1	32.5	26.0	32.5

4. Demography

(1) Population

- 1) Block Population 11,000 (Ngatshang)
- 2) Project Scheme Population
 - a. Population 773 (100%)
(Male: 48%, female: 52%)
 - b. Student (5-14 years) 215 (28%)
 - c. Labour Force (15-54 Years) 393 (51%)

Age	Male	Female	Total
0 - 4	57	61	118
5 - 9	53	72	125
10 - 14	43	47	90
15 - 19	43	42	85
20 - 24	32	37	69
25 - 29	31	22	53
30 - 34	23	21	44
35 - 39	23	22	45
40 - 44	15	15	30
45 - 49	16	14	30
50 - 54	17	20	37
55 - 59	17	25	42
60 - 64	4	1	5
65 -	0	0	0
Total	374	399	773

- 3) Share of Population in Block 7%

(2) No. of Household

- 1) Block 1,570
- 2) Project Area
 - a. Total 108
 - b. Share of (a) to (1) 7%
- 3) Average Family Size of the Scheme 7.2

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Yadi project area are as follows:

Cambisols generally located in paddy field and dry land.

Lithosols/Regosols .. steep slope, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet	Dry	Tsheri	Others	Total
Project Area	29	77	30	0	1.36
Average Holdg Size	0.27	0.71	0.28	0	1.26

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	29	1.6	46
	- Buckwheat	10	0.6	6
	- Maize	0	0	0
	- Total	39	-	-
2) Dry Land	- Maize	77	22	169
	- Wheat	0	0	0
	- Mustard	2	07	1
	- Barley	40	0.7	28
	- Potato	0	0	0
	- Chilli	0	0	0
	- Total	119	-	-
3) Tsheri Land	- Maize	6	2.2	13
	- Buckwheat	0	0	0
	- Soyabans	0	0	0
	- Total	6	-	-

(3) Cropping Intensity (%)

- Wet land	134
- Dry land	135
- Tsheri land	20
- Total land	121

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	395	22	320	300
Adult	790	44	150	400
Total	1,185	66	470	700
Average Holding per Household	11.0	0.6	4.4	6.5

7. Irrigation

- (1) Intake: Inlet to the canal only at EL 1,580 m
- (2) Canal: 1.34 km long of masonry canal along Highway, EL 1,490 m at canal end

(3) O & M and Necessity of Improvement

- 1) Intake : No facility
- 2) Canal : Major parts of canal invert are eroded due to steep slope and inadequate concrete curing.
- 3) Major collapse : Nothing

(4) Irrigation

No more potentiality for development or improvement of facilities

8. Rural Facilities

(1) Access Road and Necessity of Improvement

This area faces the national road. The farm roads in the area is not efficiently developed.

(2) Other Public Facilities

Water Supply, Electrification, School, Basic health unit, Agricultural extension center, Grocer

9. Farmers' Intension for Development

- (1) Construction/Rehabilitation of irrigation facilities
- (2) Promotion of agricultural mechanization
- (3) Strengthening of agricultural extension

10. Remarks

This area is favorably located in the middle point between Mongar and Tashigang capitals as agricultural productive position. The degree of development is also prior to other project area.

SOIL PROFILE DESCRIPTION

I. General Information at the Site:

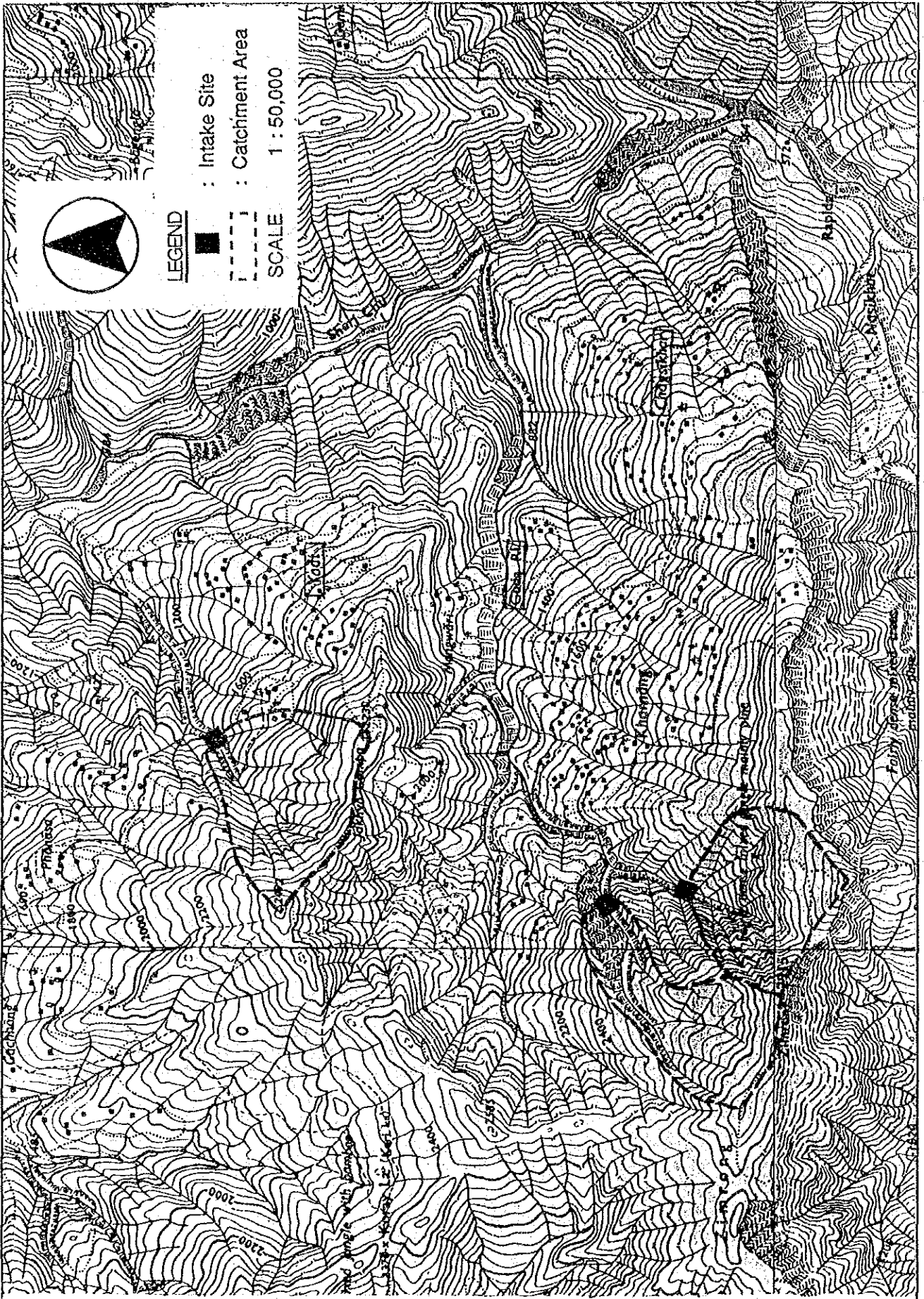
- a) Profile number 13
- b) Soil name Distric Cambisols
- c) Date of examination Jauuary 24, 1988
- d) Location Yadi, 1,420 m
- e) Land form:
 - 1) Physiographical Terraced fields; some dryland
 - 2) Surrounding land form Ccovered by forest, sloopy hedges, undulating
- f) Slope Gently slope; 2-5% and no evidence of erosion at the site
- g) Land use/vegetation..... Paddy field; bullock ploughing

II. General Information of the Soil:

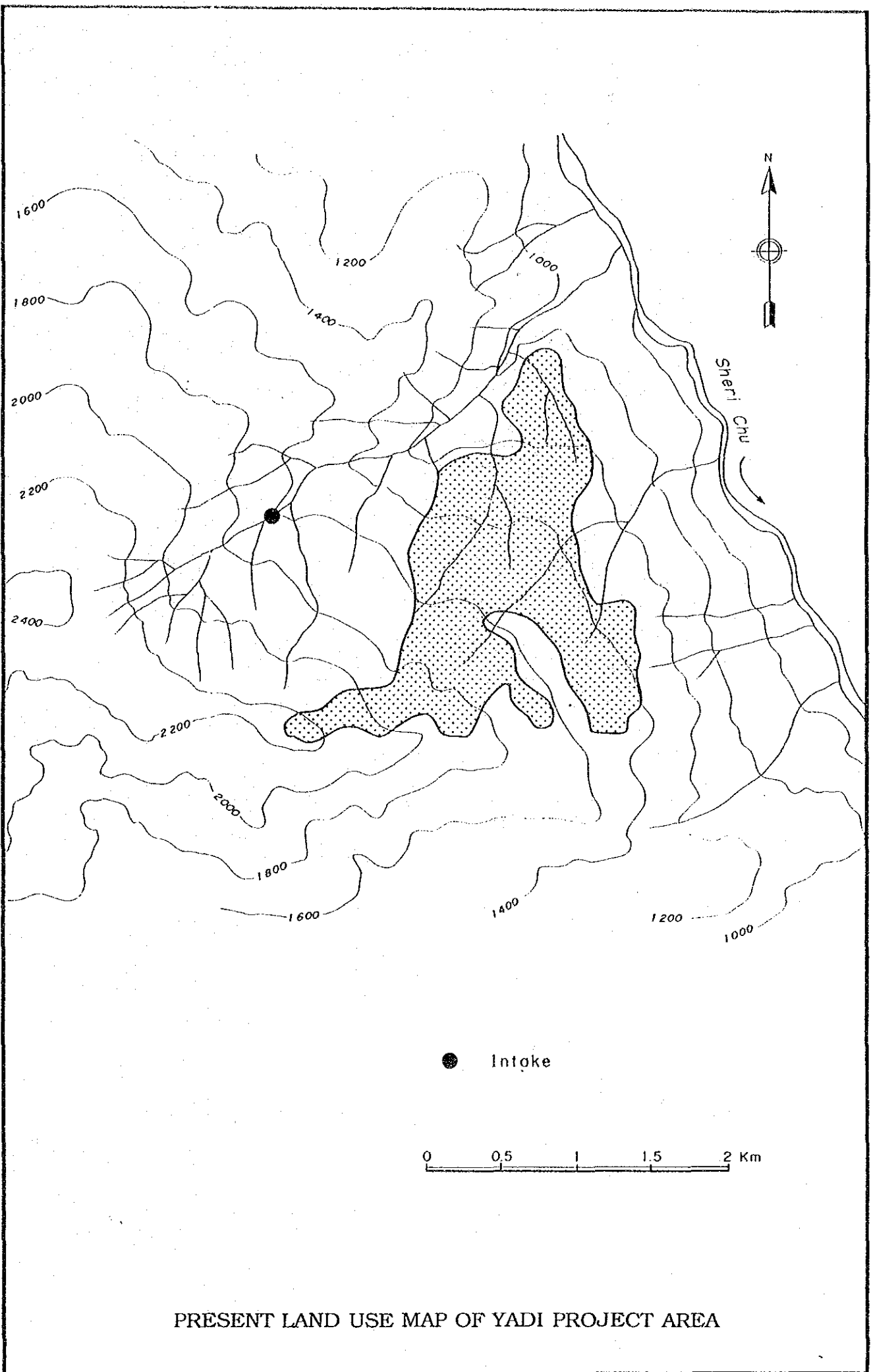
- a) Parent material Alluvial and colluvial
- b) Drainage Good; well drained
- c) Moisture condition of the site .. Moist
- d) Depth of groundwater >100 cm
- e) Surface stones/rock outcrops None at site
- f) Erosion No. evidence
- g) Human influence Ploughing and paddy cultivation going on

III. Profile Description:

<u>(Horizon)</u>	<u>(Depth)</u> (cm)	<u>Description</u>
A	0 - 15	5YR 5/1, brownish grey, many, medium, distinct, clay loam, medium, blocky, medium size, slightly sticky, slightly plastic, loose when moist and dry, frequent paddy roots, diffuse, irregular, medium.
B	15 - 40	7.5YR 5/2. greyish brown, many, fine to medium size, 5YR 5/6, silty loam, 5-10 mm, weak, blocky, Slightly sticky, non-plastic, loose, few grass roots, pebbles, weathered, clear, irregular.
C	40 -	10YR 5/3, dull yellowish brown, few, fine, faint, silt loam, 80%-90%, weak, sub-angular blocky, medium, slightly sticky, non-plastic, some boulders present, medium.



CATCHMENT AREA AT INTAKE SITE, YADI



PRESENT LAND USE MAP OF YADI PROJECT AREA

16. CHASKHAR PROJECT AREA

1. Location

- (1) District: Mongar Block: Chaskhar Village: Chaskhar
- (2) Locatio: 70 minutes by vehicle from district capital through the national road, and 90 minutes walk from the national road.

2. Topography

- (1) Elevation: Intake Structure ; EL 1,960 m - EL 1,850 m
Farm Land ; EL 1,400 m - EL 1,900 m
- (2) Slope and Direction of Farm Land
Slope: 1/3 Direction: North to West

3. Climate and Water Resources

- (1) Climate (Station: Yadi)

Temperature

(unit: °C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Max	16.6	17.3	20.1	23.0	24.5	26.2	25.1	26.2	24.9	23.2	20.0	17.3	22.0
Min	10.0	9.5	11.8	14.5	16.5	19.9	19.8	19.8	18.9	14.3	9.9	8.9	14.5
Average	13.3	13.4	15.9	18.8	20.5	23.1	22.5	23.0	21.9	18.8	15.0	13.0	18.2

Relative Humidity

(unit: %)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	66.7	70.2	62.3	70.0	74.5	81.0	89.0	85.7	87.6	79.9	70.1	72.2	75.8

Rainfall

(unit: mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
	0	5.9	39.1	77.9	69.4	130.5	206.6	125.5	135.4	43.8	7.5	8.6	850.1

- (2) Water Resource

- 1) River Name : Goda ri Loda ri
- 2) Catchment Area : 2.03 km² 1.70 km²
- 3) Length of River : 1.30 km 2.45
- 4) Mean Elevation of River : EL 2,280 m EL 2,440 m
- 5) Available Water : :

(unit: lit./s)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Mean	61.9	48.5	52.6	79.5	92.1	140.6	247.3	186.1	204.4	102.2	83.6	67.9	113.8
Drought	38.4	35.4	32.5	39.5	58.6	74.6	114.5	87.7	66.8	62.7	59.7	47.7	59.7

4. Demography

(1) Population

- 1) Block Population 5,600 (Chaskhar)
- 2) Project Scheme Population
 - a. Population 2,656 (100%)
(Male: 49%, Female: 51%)
 - b. Student (5-14 years) 611 (23%)
 - c. Labour Force (15-54 years) 1,374 (52%)

Age	Male	Female	Total
0 - 4	202	192	394
5 - 9	154	195	349
10 - 14	124	138	262
15 - 19	109	135	244
20 - 24	91	94	185
25 - 29	120	92	212
30 - 34	91	110	201
35 - 39	74	89	163
40 - 44	51	61	112
45 - 49	67	81	148
50 - 54	55	54	109
55 - 59	55	54	109
60 - 64	41	22	63
65 -	68	37	105
Total	1,302	1,354	2,656

- 3) Share of Population in Block 46%

(2) No. of Household

- 1) Block 710
- 2) Project Area
 - a) Total 332
 - b) Share of (a) to (1) 47%
- 3) Average Family Size of the Scheme 8.0

5. Land Use and Soil

(1) Land Use

Present land use is illustrated in attached land use map.

(2) Soil

Main soil units in the Chaskhar project area are as follows:

Cambisols generally located in paddy field and dry land.

Lithosols/Regosols .. steep slopes, shallow surface layer, stony phase.

6. Agriculture

(1) Agricultural Land Use

	(Unit: ha)				
	Wet	Dry	Tsheri	Others	Total
Project Area	46	186	73	0	305
Average Holdg Size	0.14	0.56	0.22	0	0.92

(2) Agricultural Production

		Area (ha)	Unit Yield (t/ha)	Production
1) Wet Land	- Paddy	46	1.5	69
	- Buckwheat	4	1.1	4
	- Maize	0	0	0
	- Total	50	-	-
2) Dry Land	- Maize	186	2.1	391
	- Wheat	0	0	0
	- Mustard	0	0	0
	- Barley	100	1.0	100
	- Potato	10	8.7	87
	- Chilli	0	0	0
	- Total	296	-	-
3) Tsheri Land	- Maize	14	2.1	29
	- Wheat	4	1.1	4
	- Soyabans	0	0	0
	- Total	18	-	-

(3) Cropping Intensity (%)

- Wet land	109
- Dry land	159
- Tsheri land	25
- Total land	119

(4) Livestock Production

	(Unit: head)			
	Cattle	Horse	Pig	Poultry
Young	150	20	200	500
Adult	2,500	70	1,500	2,500
Total	2,650	90	1,700	3,000
Average Holding per Household	8.7	0.3	5.6	9.8

7. Irrigation

- (1) Intake: Random stone fill weirs, 0.28 t/sec capacities of two intake at EL 1,980 m & EL 1,960 m, 18 additional inlets from small streams.
- (2) Canal: Constructed in 1985, renovation is under progress. 6.3 km long, mostly masonry canal except 0.6 km of earth canal, EL 1,850 m at canal end.

- (3) O & M and Necessity of Improvement
- 1) Intake ; to be improved to prevent leakage water
 - 2) Canal ; 2 km of canal is under renovation
 - 3) Major collapse ; Nothing

(4) Irrigation

Irrigation water is insufficient due to a lot of leakage water in intake and canal.

8. Rural Facilities

(1) Access Road and Necessity of Improvement

The foot path is passable only on foot or by horse and needs the renovation on account of steep slope and many exposed rocks.

(2) Other Public Facilities

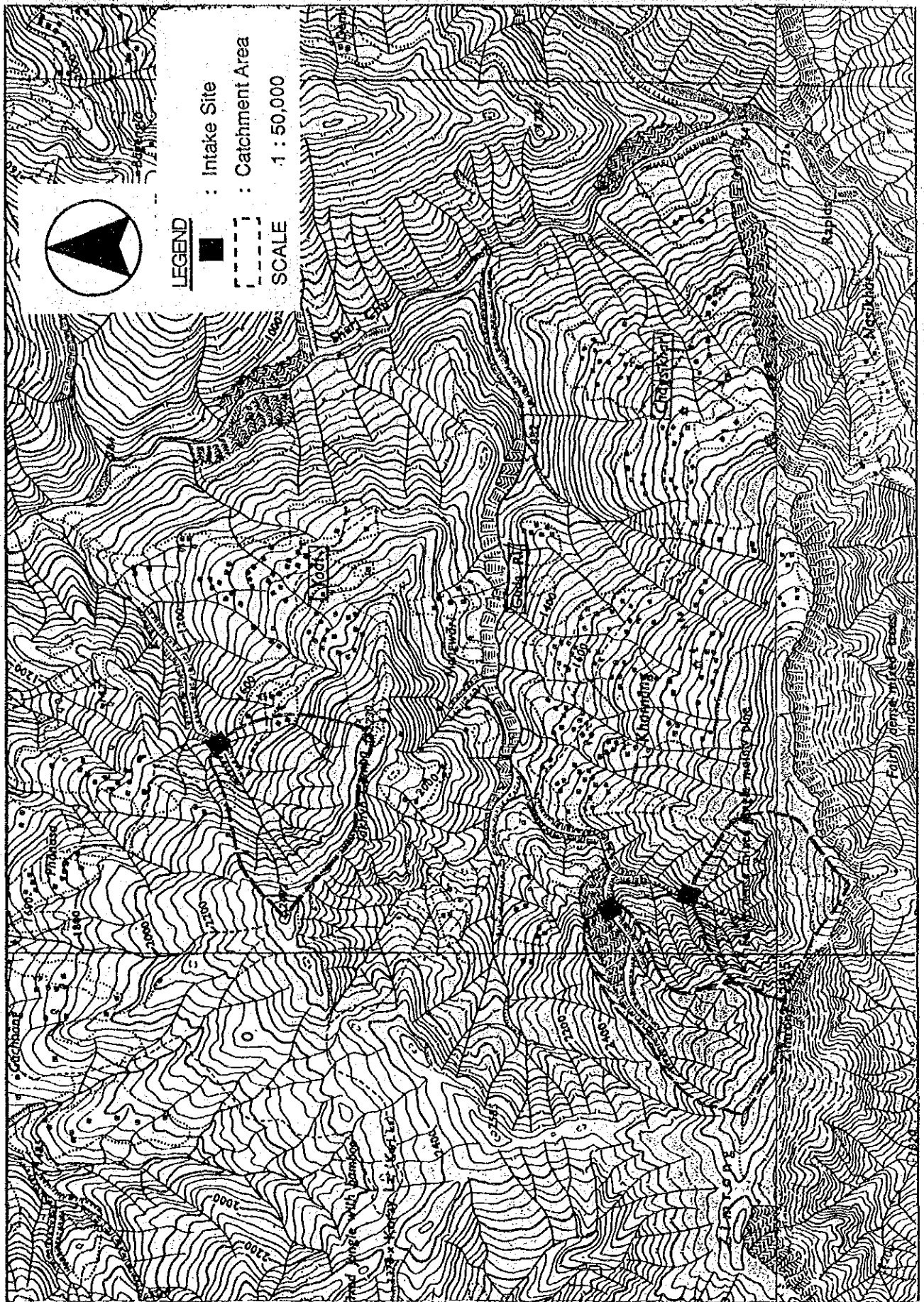
Water Supply, Meeting place

9. Farmers' Intension for Development

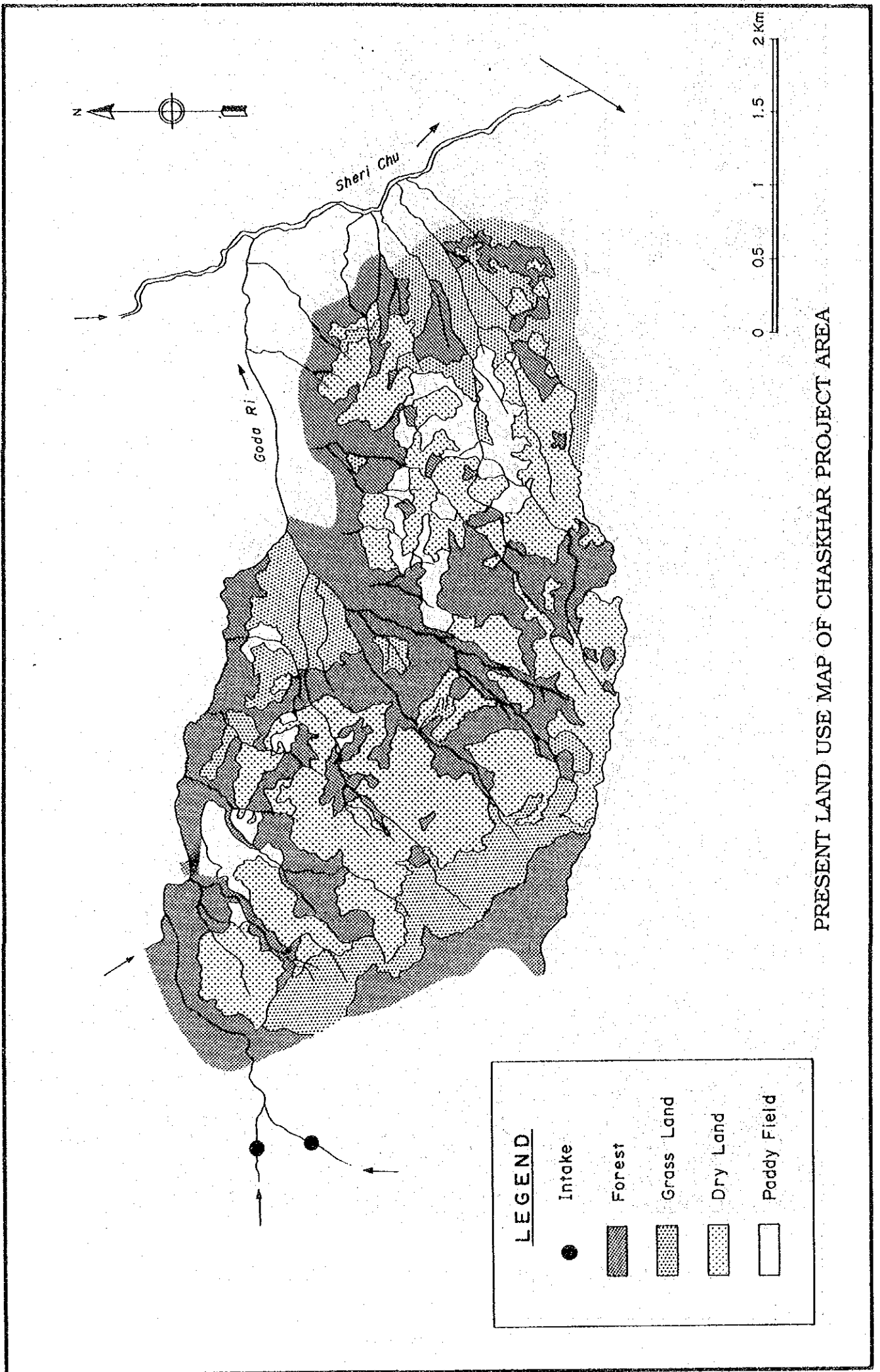
- (1) Construction/Rehabilitation of irrigation facilities
- (2) Construction of feeder road
- (3) Strengthening of agricultural extension.

10. Remarks

This has been implemented by Mongar and Tashigang Area Development Project, financed by International Fund of Agriculture Development, which is now carrying out the constructions of new sand sluiceway at two intake sites and of new secondary canals with 6 km long, and the renovation of the existing main canal with 2 km long for the irrigation area of 70 ha.



CATCHMENT AREA AT INTAKE SITE, CHASKHAR



PRESENT LAND USE MAP OF CHASKHAR PROJECT AREA

JICA