

Maps





Map 1

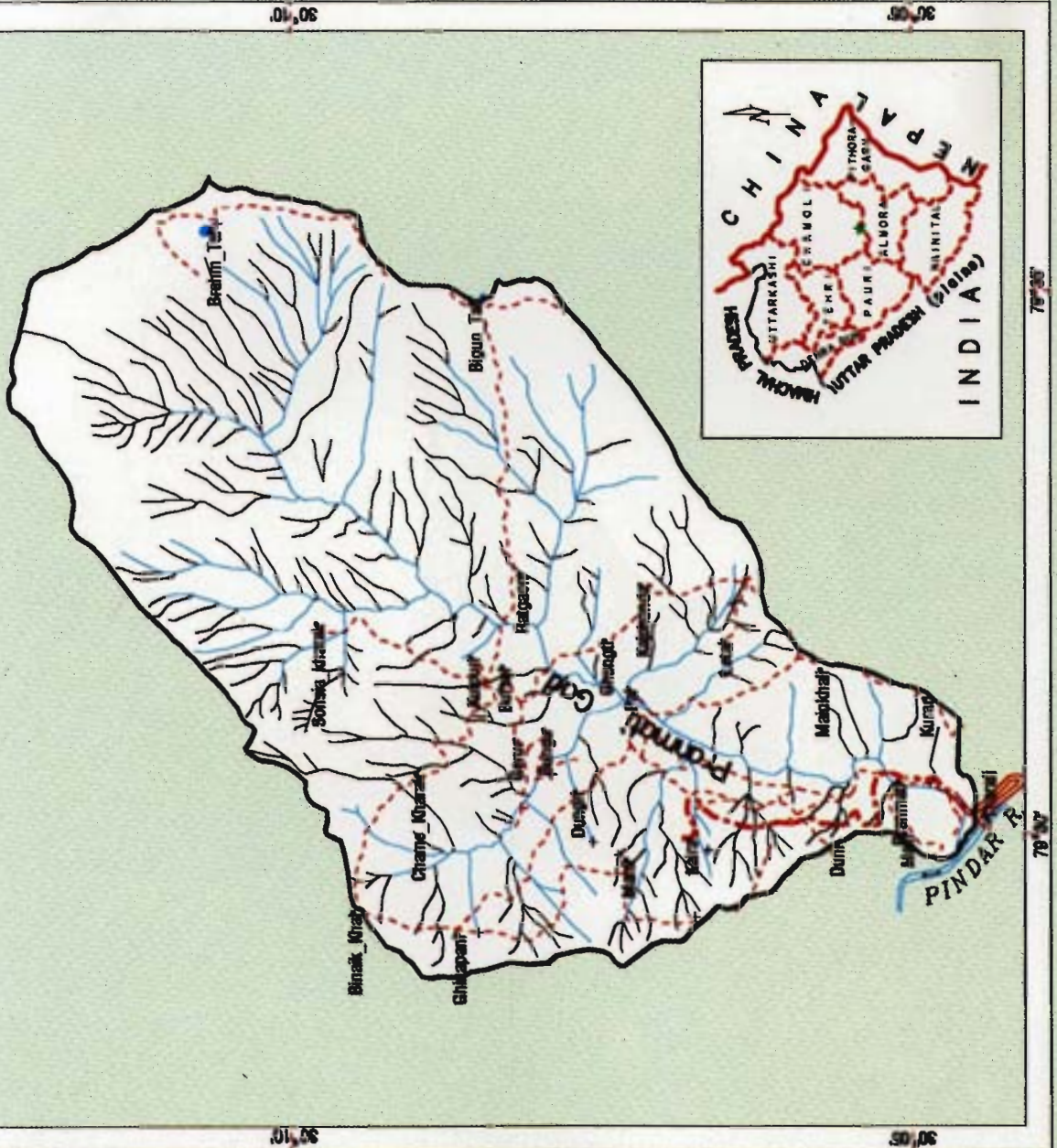
Pranmati Watershed
Garhwal Himalayas, India
General Features and Location

LEGEND

-  Perennial streams
-  Seasonal streams
-  Lakes
-  Springs
-  Pack track / footpath
-  Metalled road (constructed)
-  Road (under construction)
-  Watershed boundary

KEY TO INSET

-  International boundary
-  State boundary (in India)
-  District boundary (in Uttar Pradesh Himalayan region only)
-  Study area



78°57'

78°57'





30°10'

30°05'

Map 2

Pranmati Watershed
Garhwal Himalayas, India
Population Density (1991)

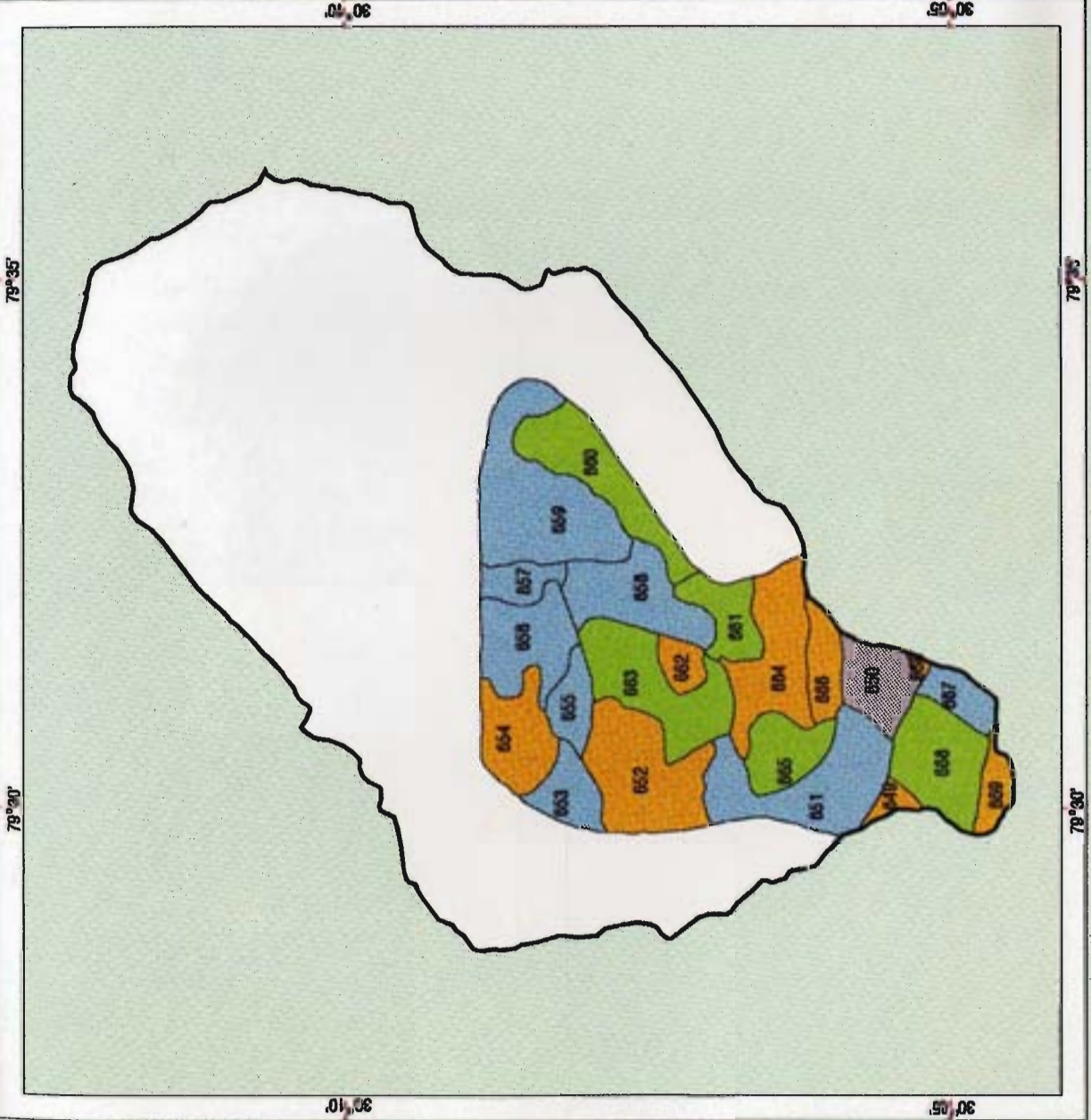
LEGEND

- Number of persons per square kilometre
-  More than 40
 -  25 to 40
 -  Less than 25
 -  Uninhabited

(PART OF THARALI BLOCK OF CHAMOLI DISTRICT, U.P.)

CENSUS CODE - VILLAGE NAMES

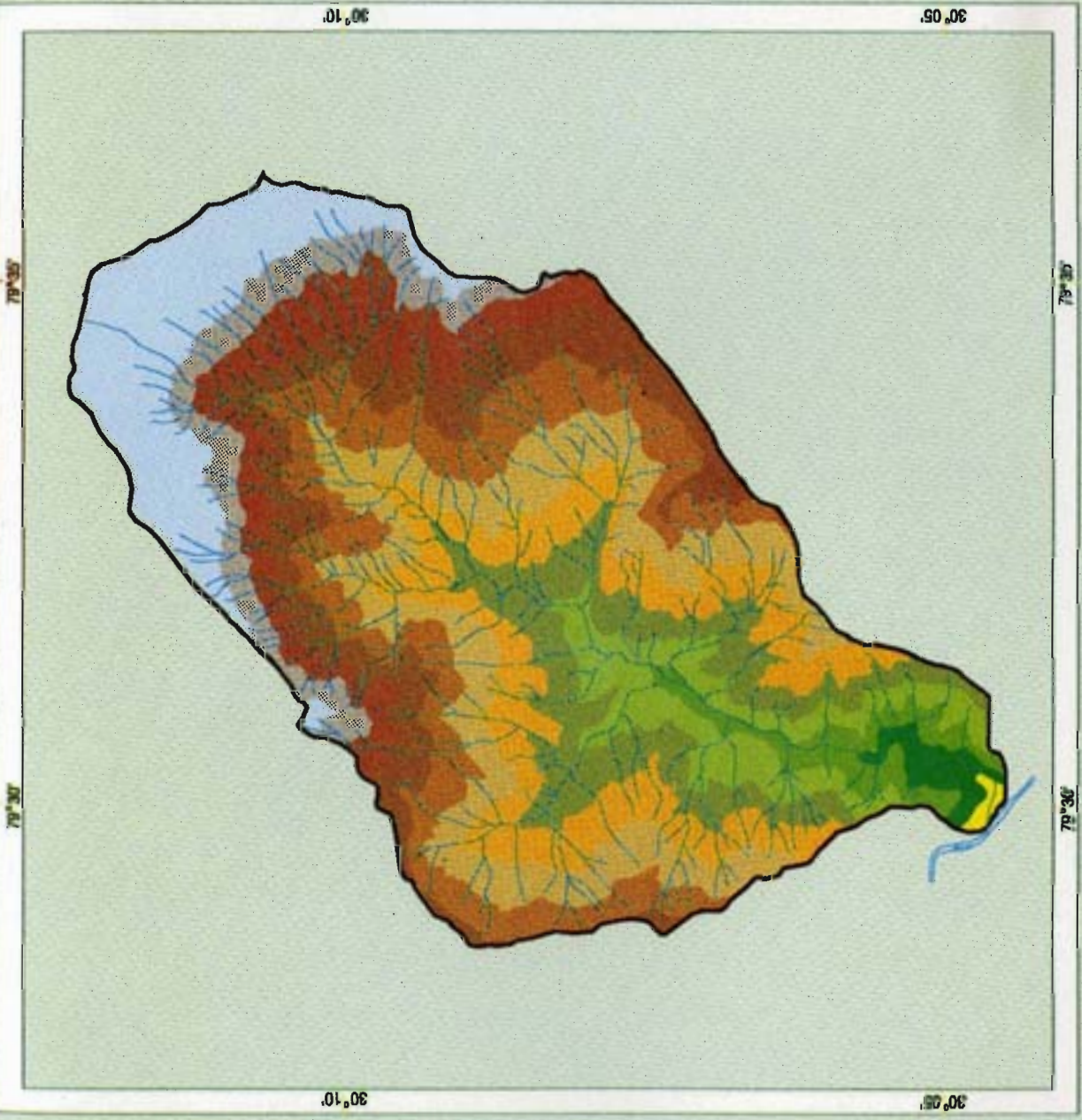
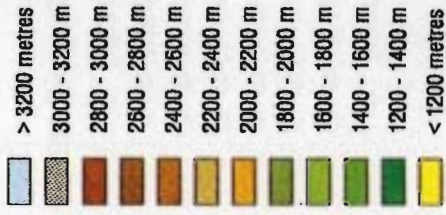
- | | |
|---------------------------|-------------------------|
| 849 - Suna | 858 - Ratgaon |
| 850 - Meih | 860 - Upri Chak Ratgaon |
| 851 - Kaira | 861 - Harinagar |
| 852 - Dungi | 862 - Guman Laga Gerur |
| 853 - Darmola Chak Dungi | 863 - Bunga |
| 854 - Ruisan | 864 - Kurar |
| 855 - Bunga Chak Goptiana | 865 - Thalarigira |
| 856 - Gerur | 866 - Partha Chak Kuni |
| 857 - Kulpuri | 867 - Sagwara |
| 858 - Bursol | 868 - Irdi Laga Suna |
| | 869 - Tharali |



Map 3

Pranmati Watershed
Garhwal Himalayas, India
Altitudinal Zones

LEGEND



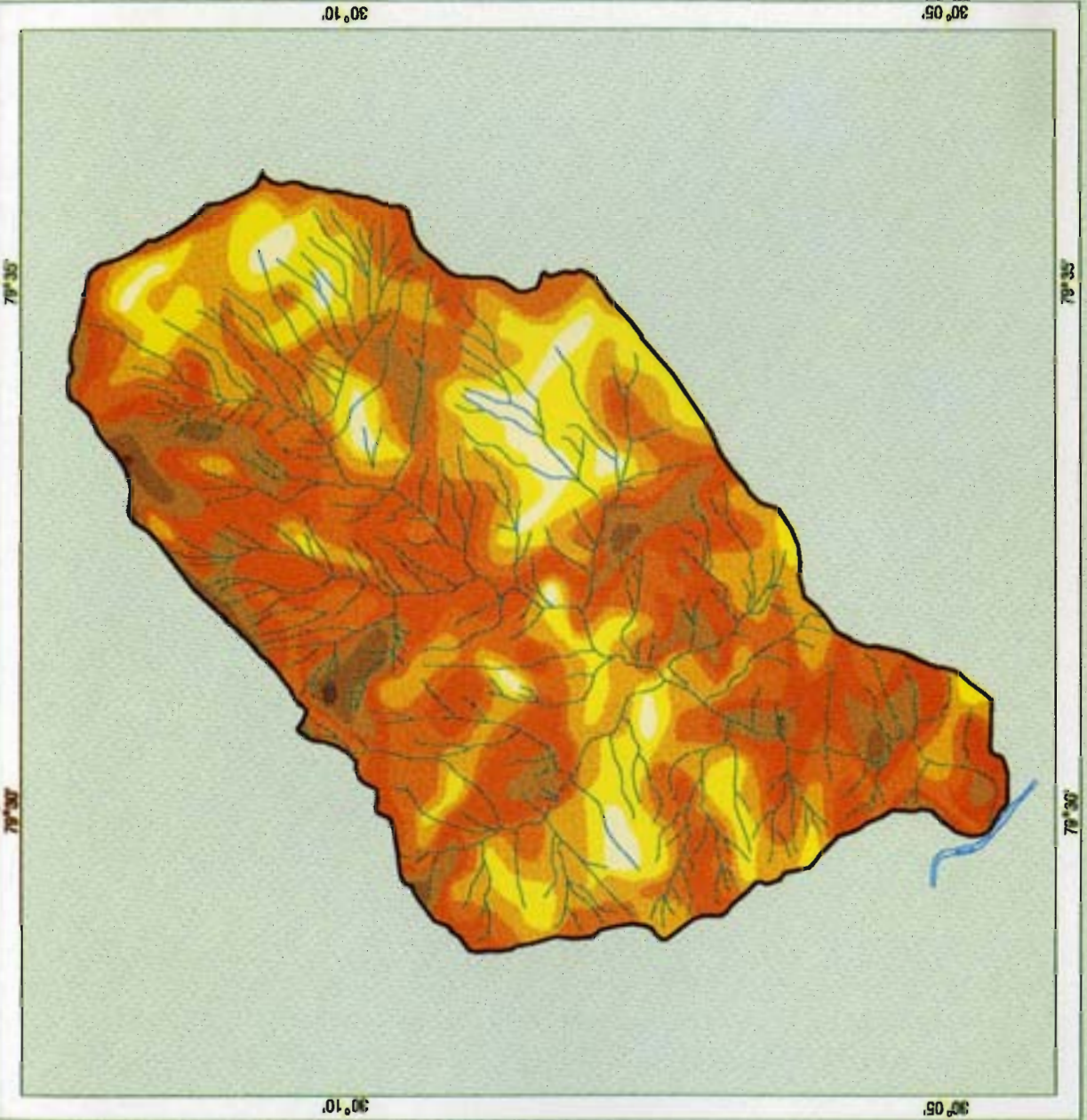
Map 4

Pranmati Watershed
Garhwal Himalayas, India

Average Slope Classes

Average slope calculations based on the
Wentworth method on a 0.25 sq. km. grid





LEGEND (Average Slope in Degrees)

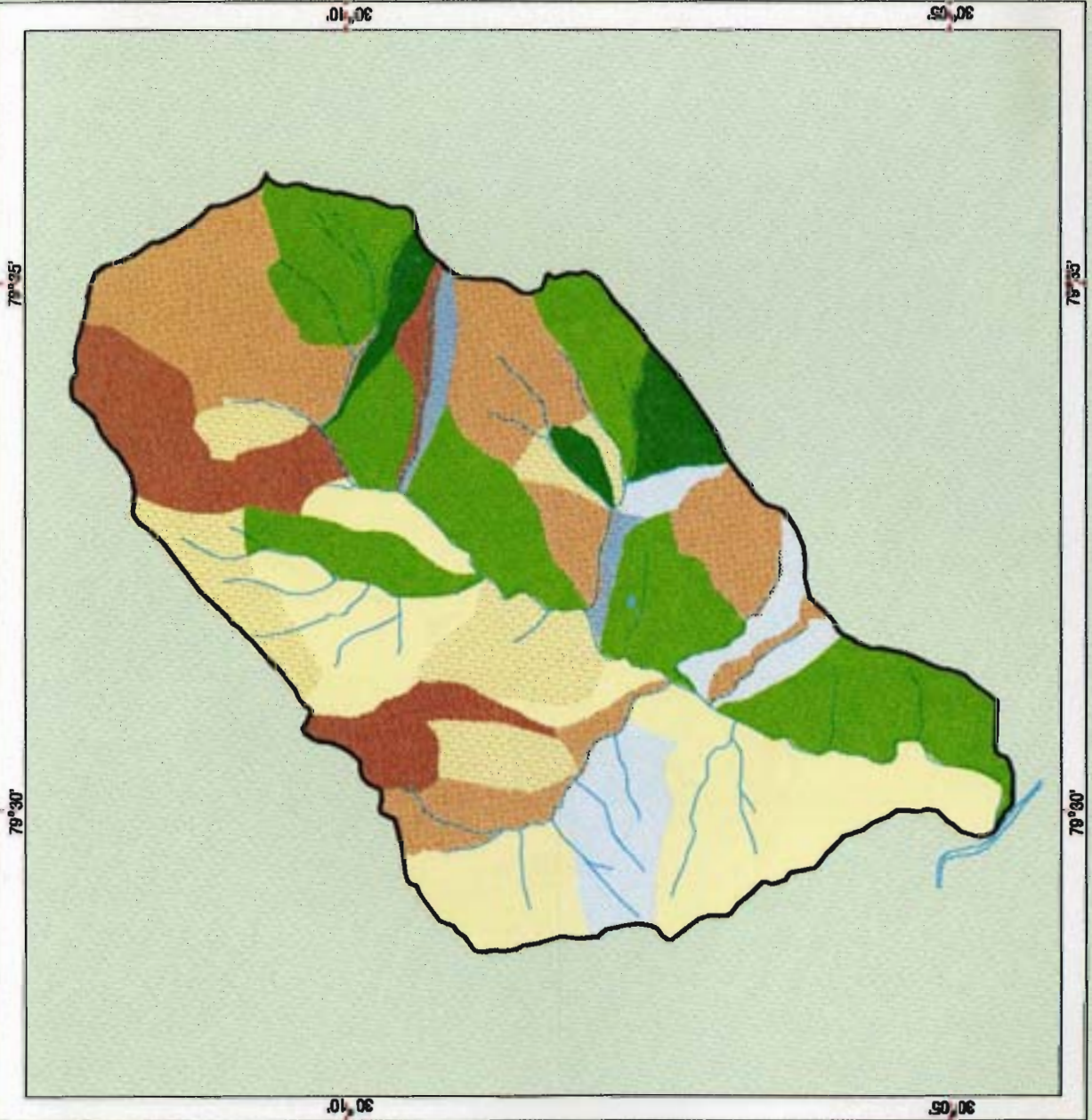


Map 5

Pranmati Watershed
Garhwal Himalayas, India

LEGEND













-  North facing
-  North-west facing
-  North-east facing
-  East facing
-  West facing
-  South-west facing
-  South-east facing
-  South facing



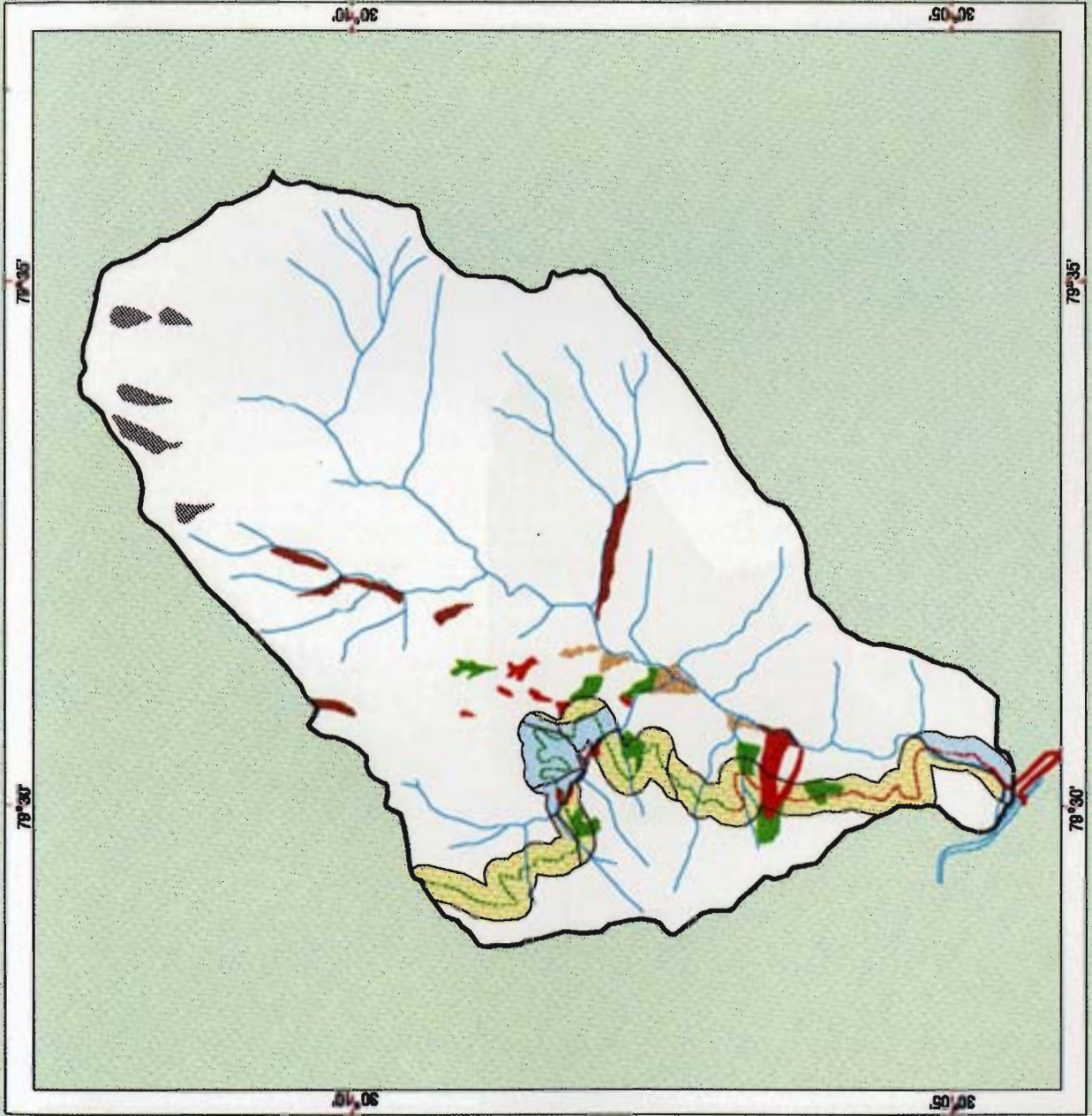
Map 6

Pranmati Watershed
 Garhwal Himalayas, India
 Erosional Impact of Proposed
 Motor Roads

LEGEND

- | | | | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------|
|  | VERY UNSAFE
Massive landslide (active)
Unstable zone (fractures and crushed rock) |  | Landslide |
|  | UNSAFE
Unstable slope (quasi-dip slope)
Rocks dip and slumping likely as
rocks dip towards the road cut |  | Debris fan |
|  | COMPARATIVELY SAFE
Relatively stable slope (anti-dip slope)
Rocks dip away from the road cut |  | Rockfall |
|  | Mettalled Road (constructed) |  | Cliff |
|  | Road (under construction) |  | Gullied/raviney land |
|  | Road (proposed) |  | Severe bank cutting |

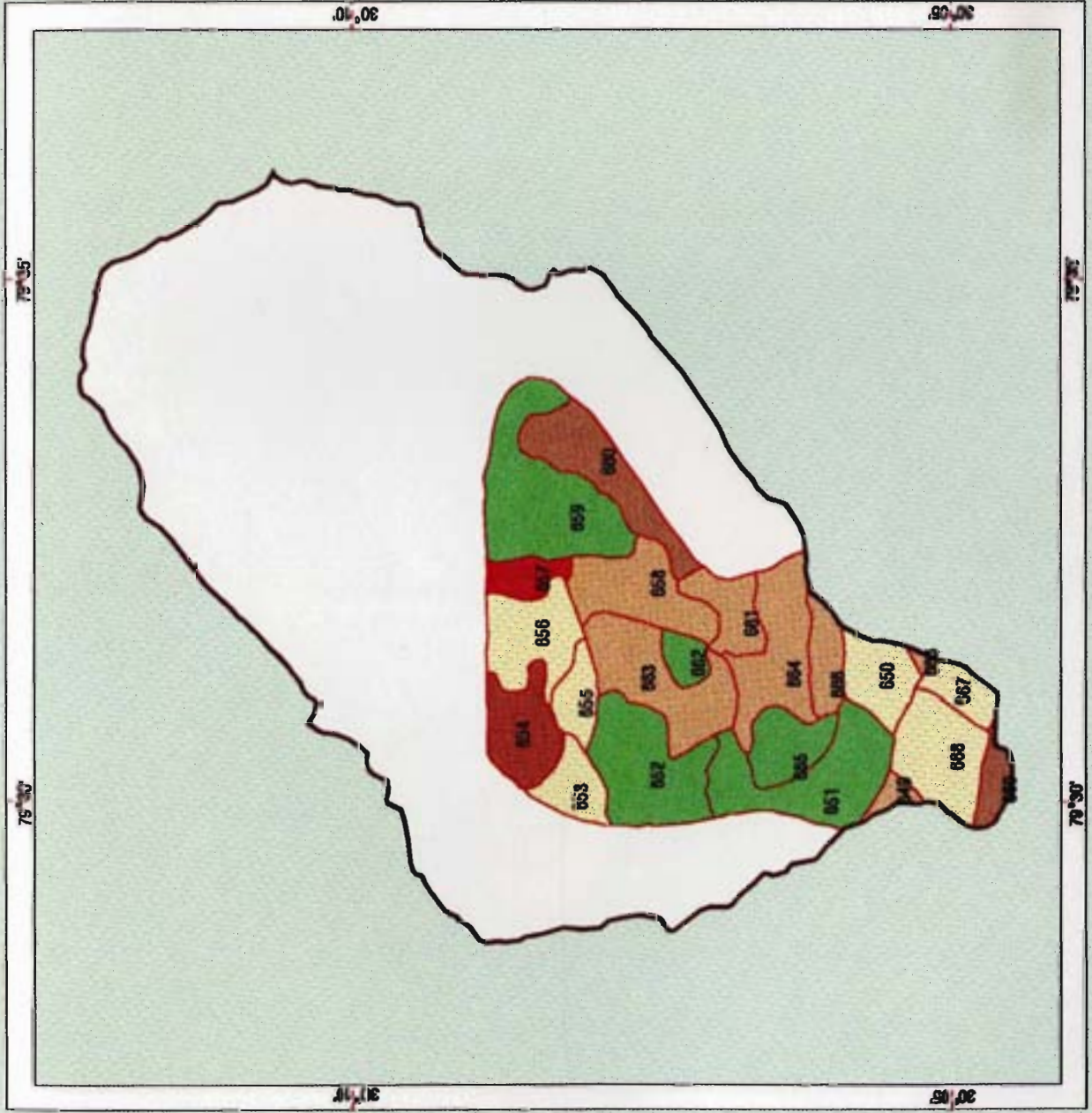
(FOCUS: RELATIVE SLOPE STABILITY WITHIN 250 METRE
 BUFFER ZONE OF PROPOSED MOTORABLE ROAD)



Map 7

Pranmati Watershed
Garhwal Himalayas, India
Population Growth (1981-91)





LEGEND

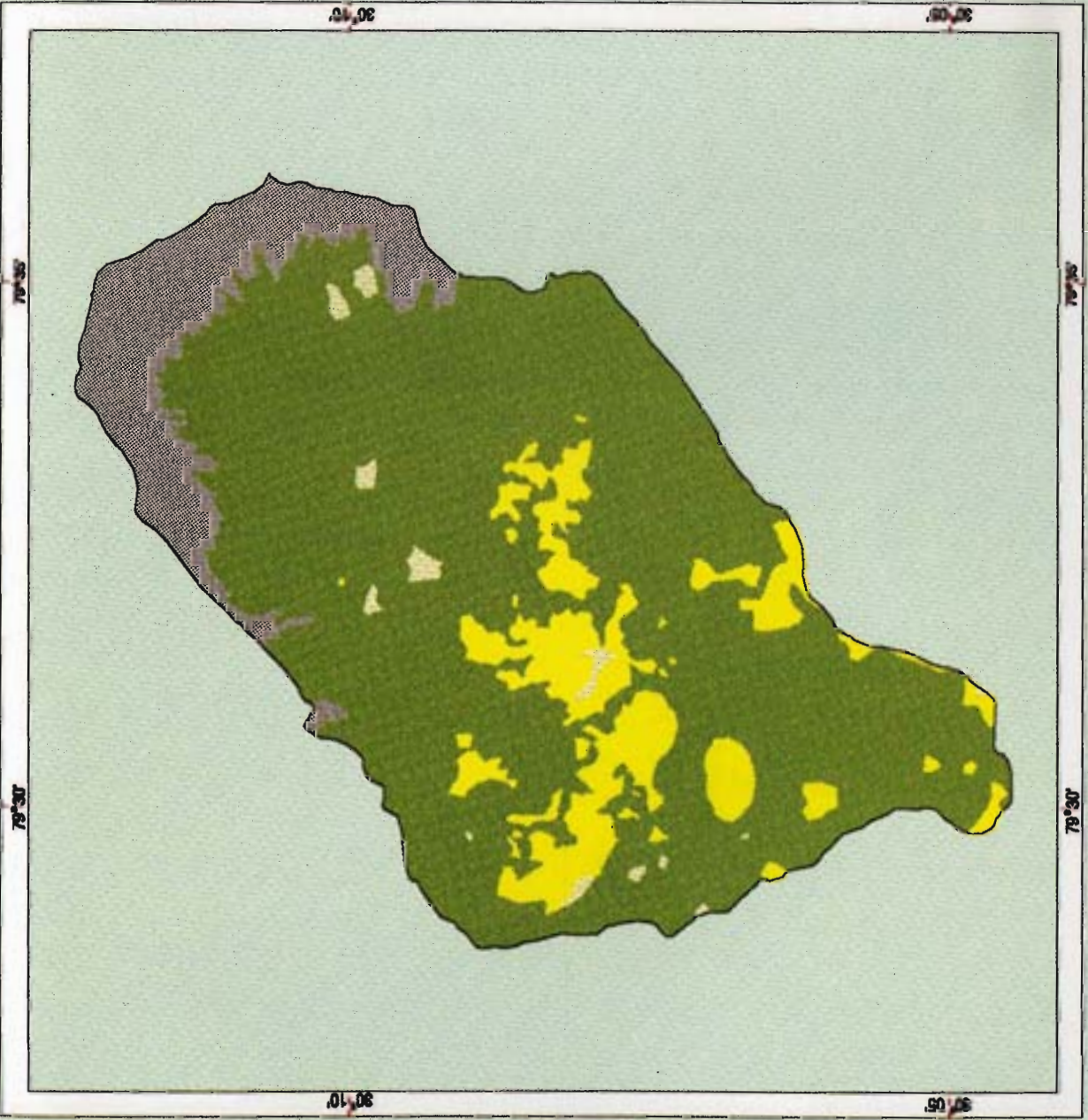


Map 8

Pranmati Watershed
Garhwal Himalayas, India
Land Use and Land Cover Map (1963)

LEGEND

-  Cultivated area with settlements (12%)
 -  Pasture lands (1.2%)
 -  Forests (74.8%)
 -  Alpine pastures, exposed rock & other areas (11.93%)
- TOTAL AREA = 9405 HECTARES

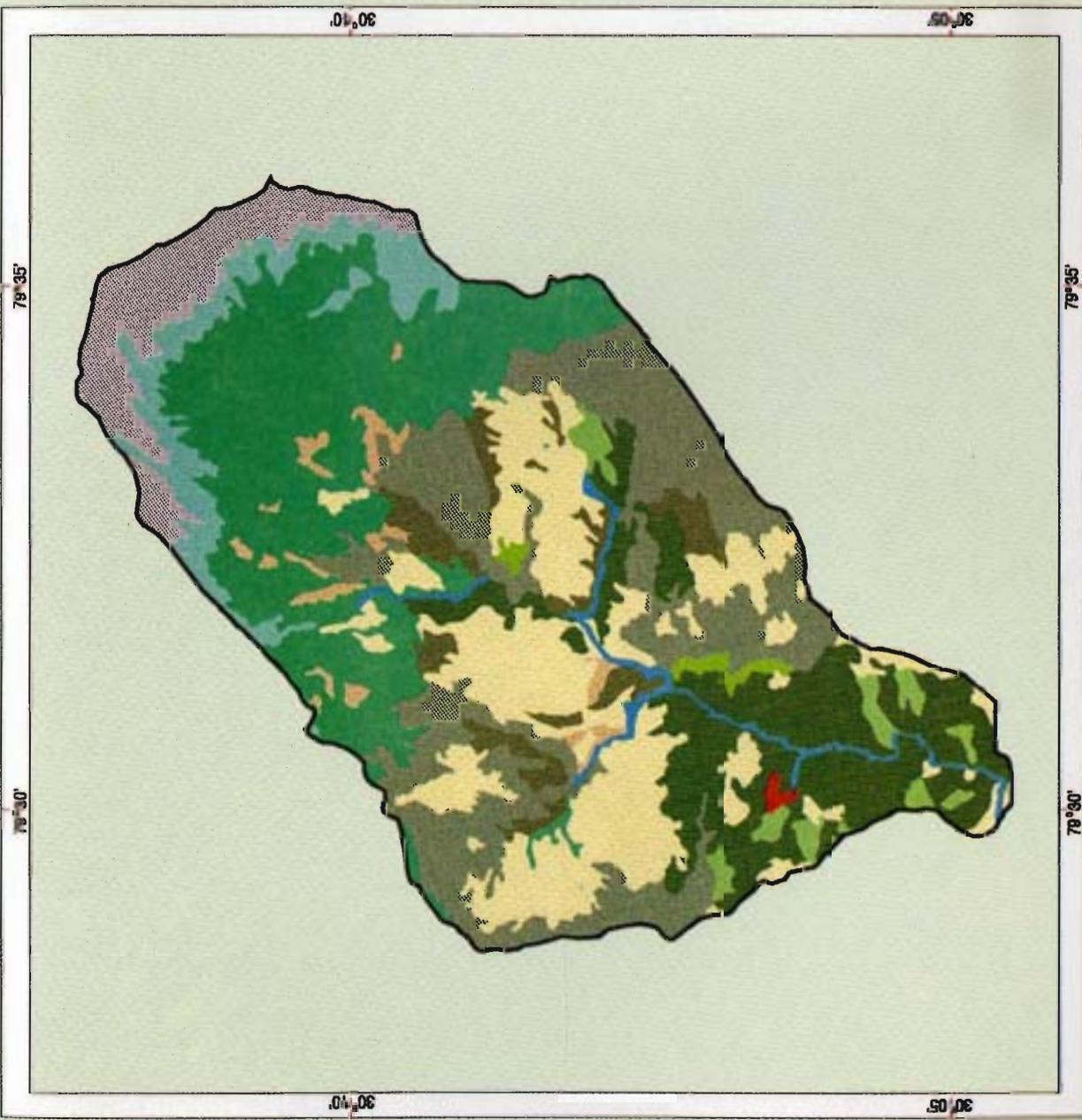


Map 9

Pranmati Watershed
Garhwal Himalayas, India
Vegetation Types & Land Use (1993)

LEGEND







-  Exposed rock (6.6 %)
-  Alpine pastures (5.5 %)
-  Pastures (2.0 %)
-  Dense mixed forest (23.24 %)
-  Oak-rhododendron (20.81 %)
-  Dense oak (1.4 %)
-  Open oak (4.2 %)
-  Open oak-pine (0.6 %)
-  Dense pine (12.6 %)
-  Open pine (2.05 %)
-  Cultivated and settlement area (18.7 %)
-  Major landslide (0.16 %)
-  River channel and channel deposits (1.5 %)

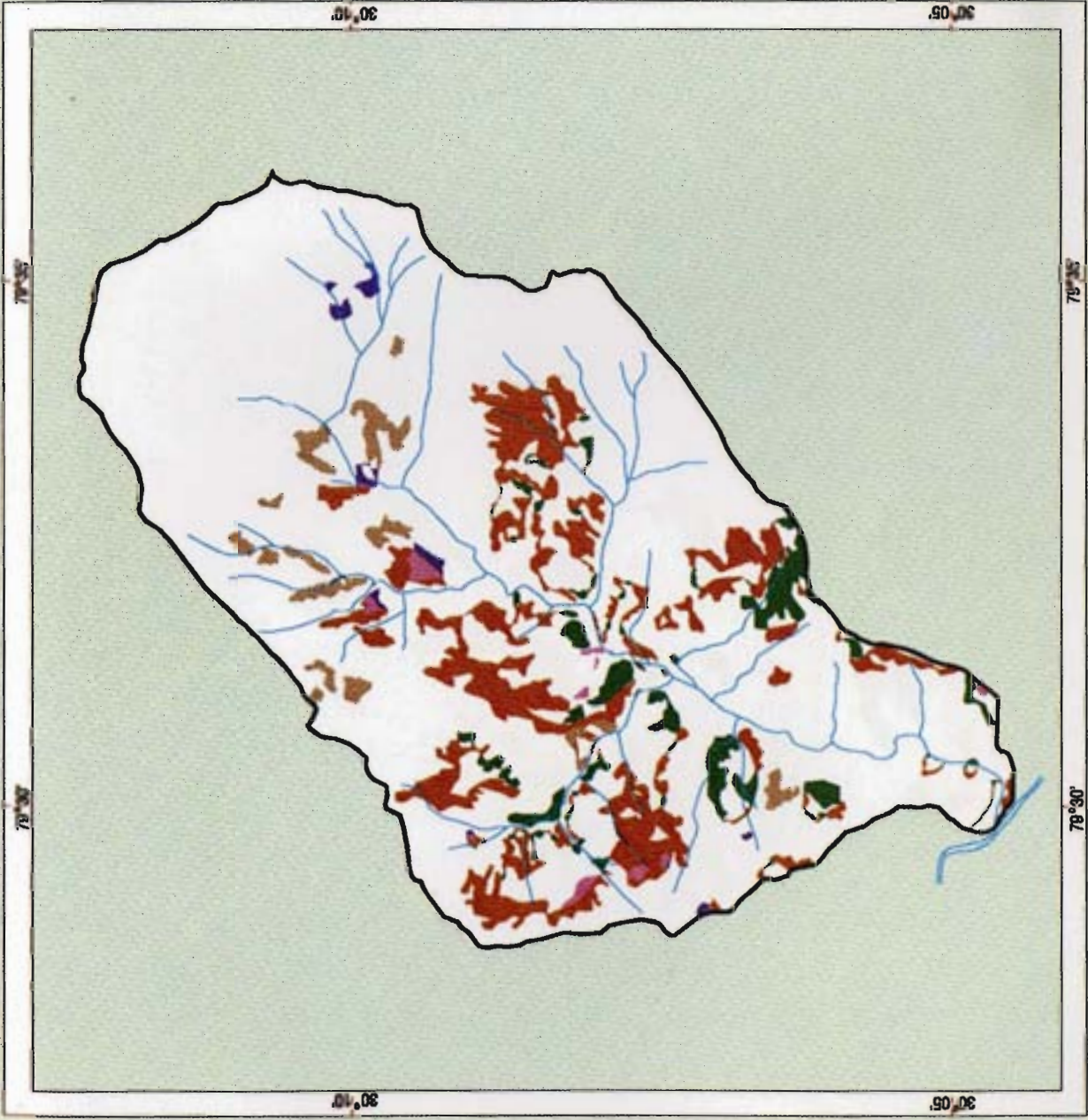


Map 10

Pranmati Watershed
Garhwal Himalayas, India
Major Land Use Changes (1963-93)

LEGEND

-  Forest to agricultural land
-  Forest to pasture or waste land
-  Agricultural land to forest
-  Agricultural land to pasture or waste land
-  Pasture land to forest
-  Pasture land to agricultural land




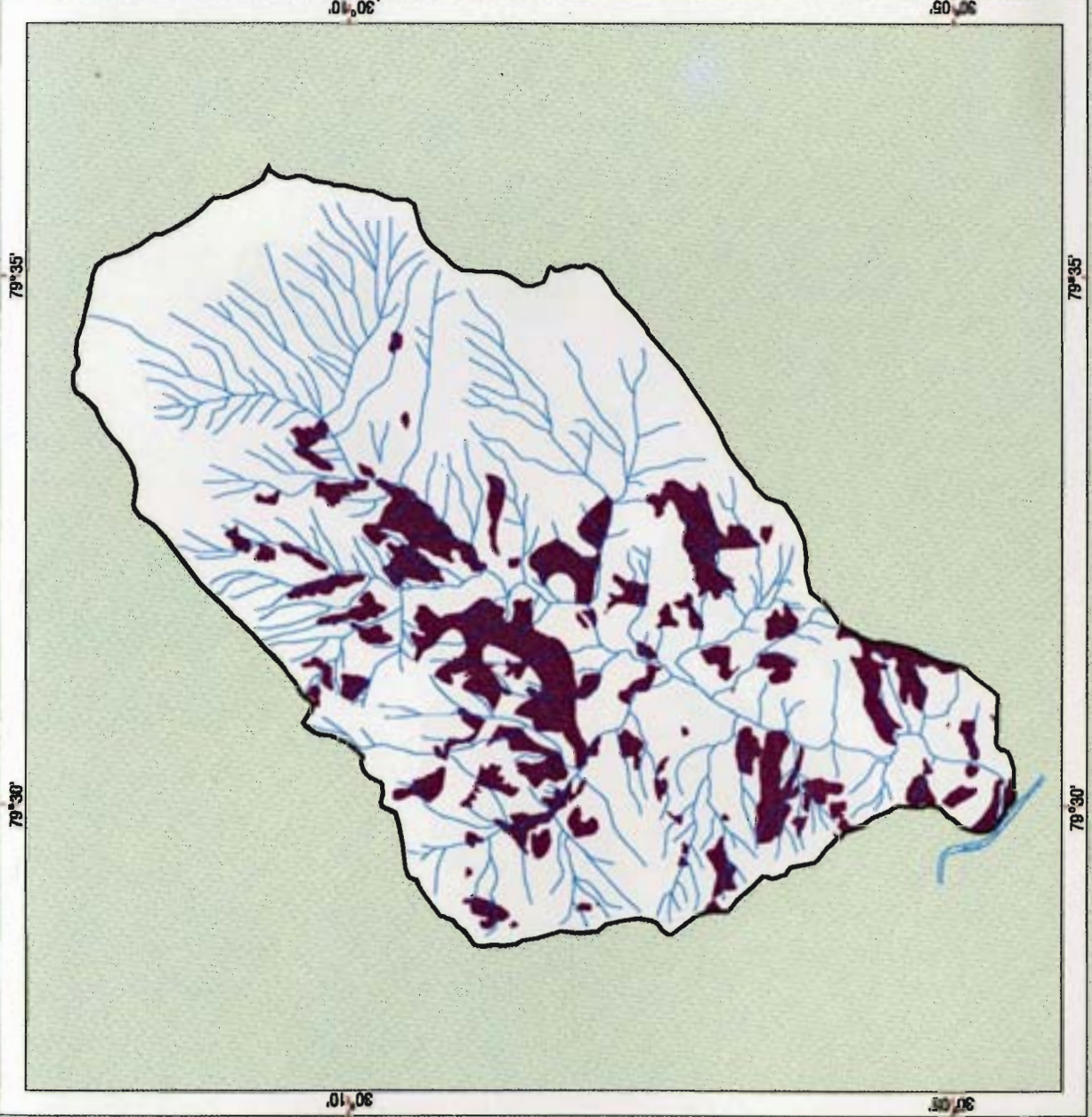
Map 11

Pranmati Watershed
Garhwal Himalayas, India

Land Vulnerable to Accelerated Erosion

LEGEND

 Land vulnerable to erosion due to intense use (e.g., cultivation, grazing, settlement) on steep slopes (>25 degrees average slope). Land protection measures are necessary in these areas.









Map 12

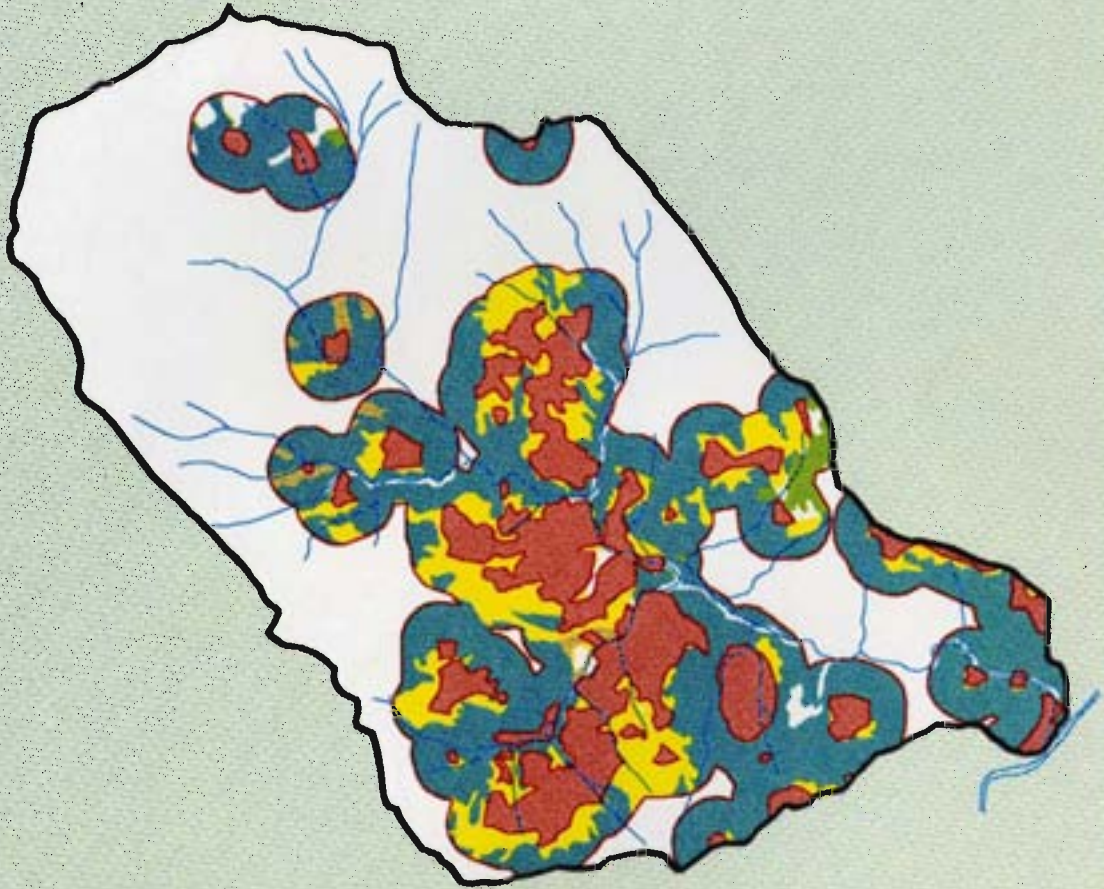
Pranmati Watershed
Garhwal Himalayas, India

Land Use Changes in the Buffer Zones
of Settlements (1963-93)

FOCUS: 0.5 KM BUFFER ZONES OF SETTLEMENTS

LEGEND

-  Regenerated forest
-  Forest area (unchanged) within buffer zone
-  New pastures, previously forest land
-  New agricultural land
-  Settlement area
-  No change within buffer zone



78°30'

78°30'

30°00'

30°00'

78°00'

78°00'

78°30'

















78°30'

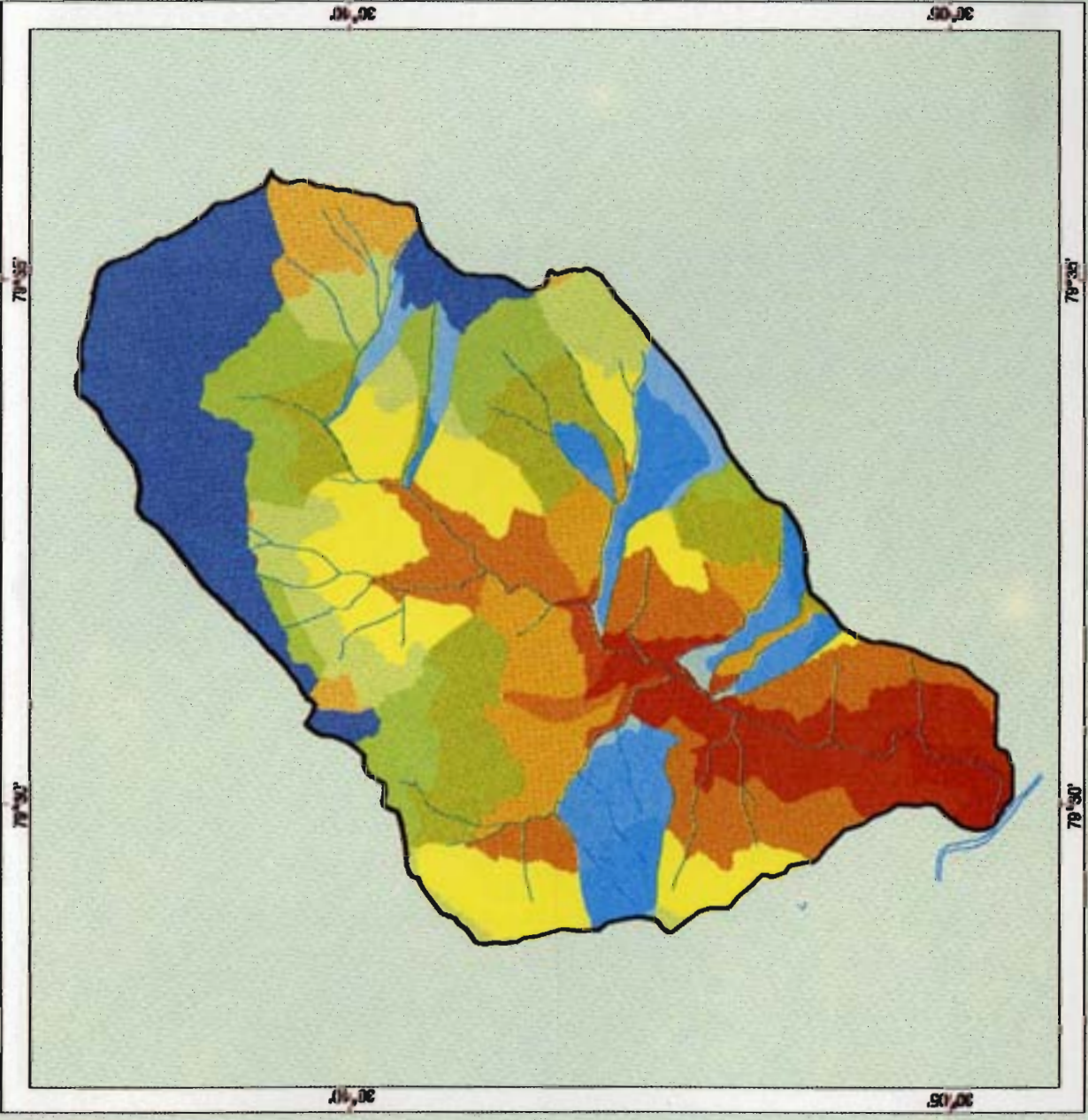
Map 13

Pranmati Watershed
Garhwal Himalayas, India

Biotic Niches

LEGEND

-  Cool moist, alpine meadows
-  Warm dry, alpine meadows
-  Warm moist, alpine meadows
-  Cool moist, sub-alpine
-  Warm dry, sub-alpine
-  Warm moist, sub-alpine
-  High elevation, moist cool
-  High elevation, warm dry
-  High elevation, warm moist
-  Mid-elevation moist cool
-  Mid-elevation warm dry
-  Mid-elevation warm moist
-  Low elevation, moist cool
-  Low elevation, warm dry
-  Low elevation, warm moist
-  Warm moist, riverine valley







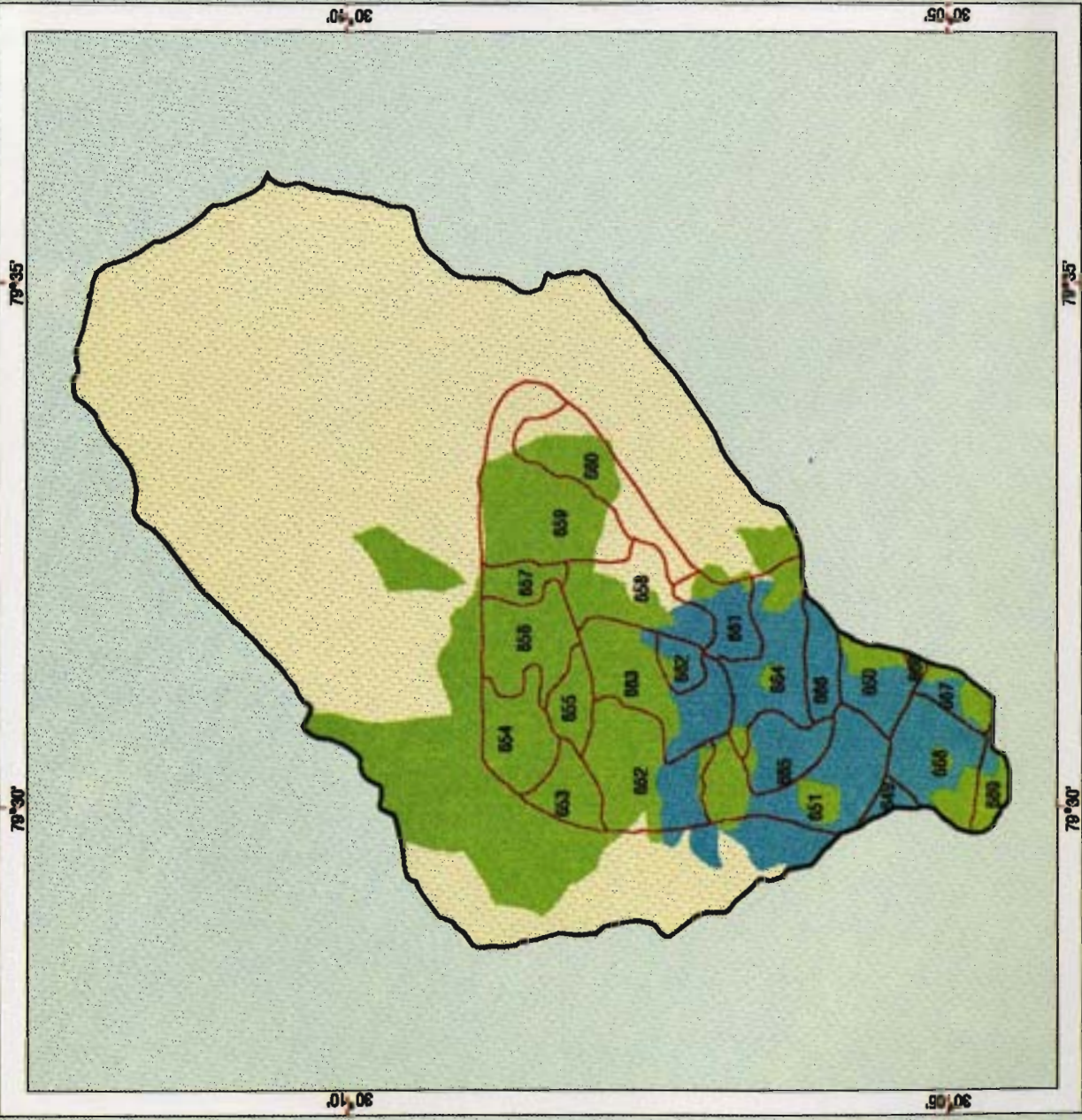
Map 14

Pranmati Watershed
Garhwal Himalayas, India

Forest Classes

LEGEND

-  Protection working circle
-  Reserved forests (Chir W.C.)
-  Village panchayat forests
-  Village boundary (acc. census 1981) with village code number





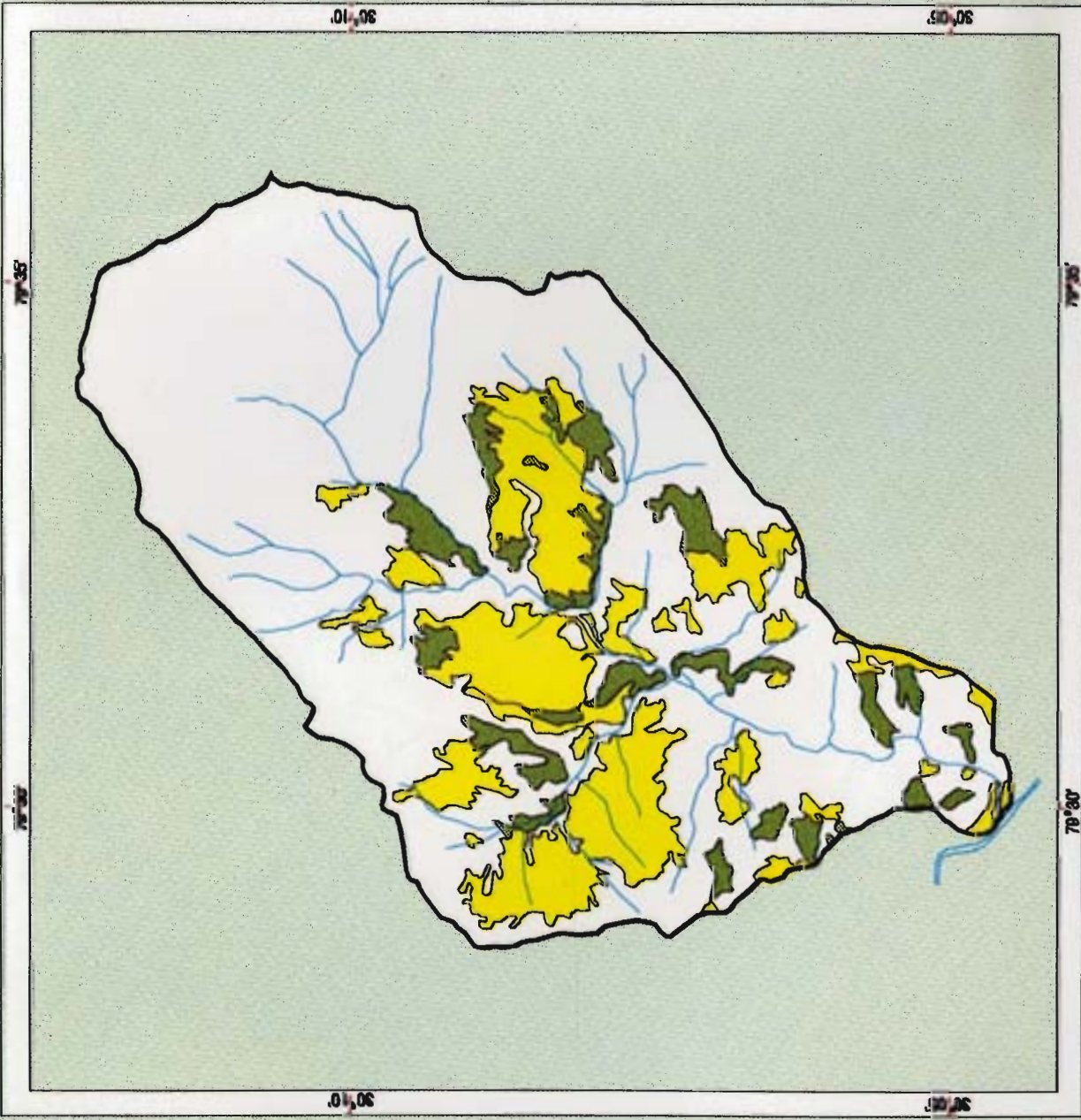
Map 15

Pranmati Watershed
Garhwal Himalayas, India

Degraded Forests

LEGEND

-  Degraded forests (< 30% crown cover)
-  Agricultural land (including settlements and fallows)








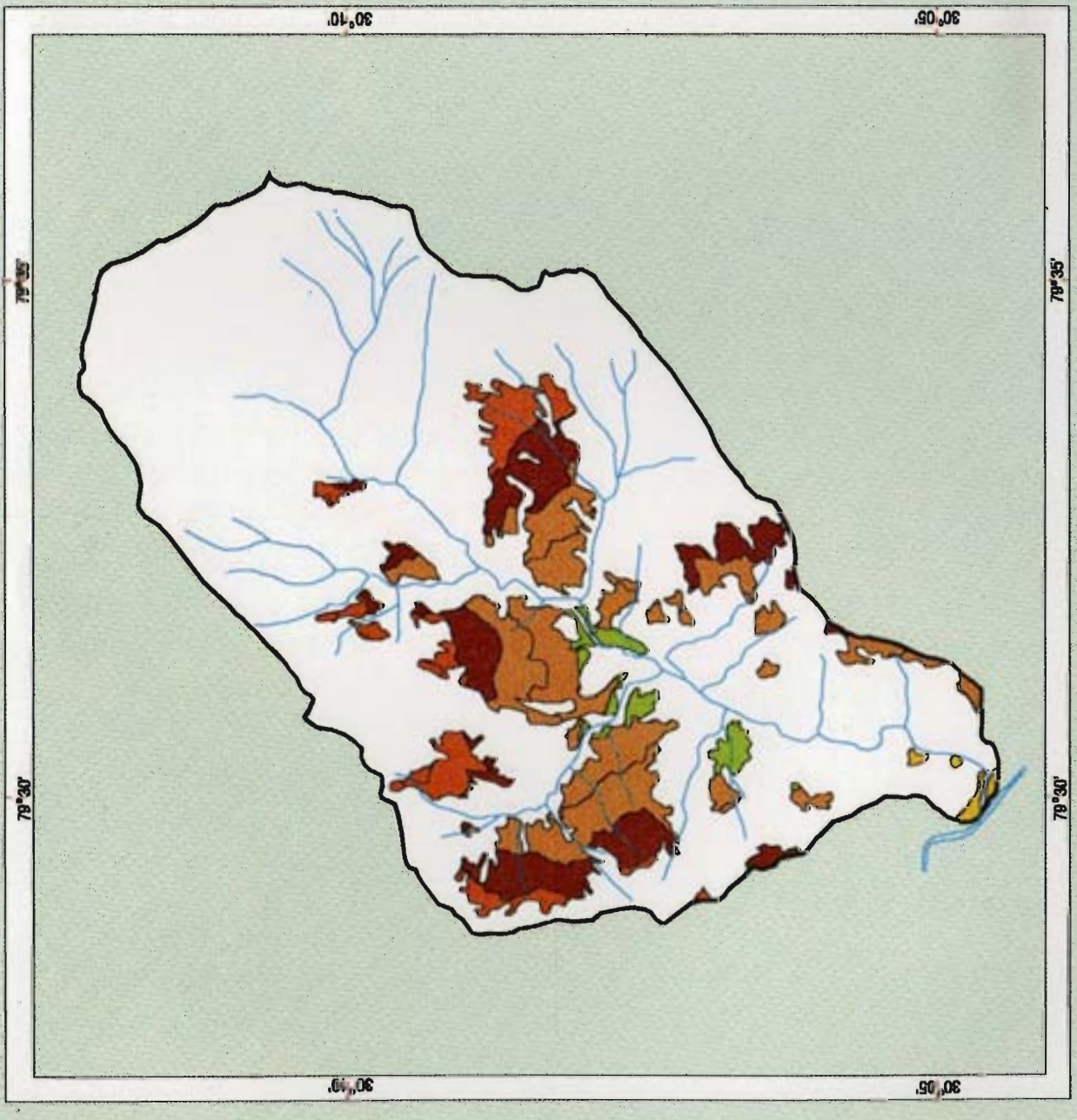
Map 16

Pranmati Watershed
Garhwal Himalayas, India

Crop Rotation Zones

LEGEND

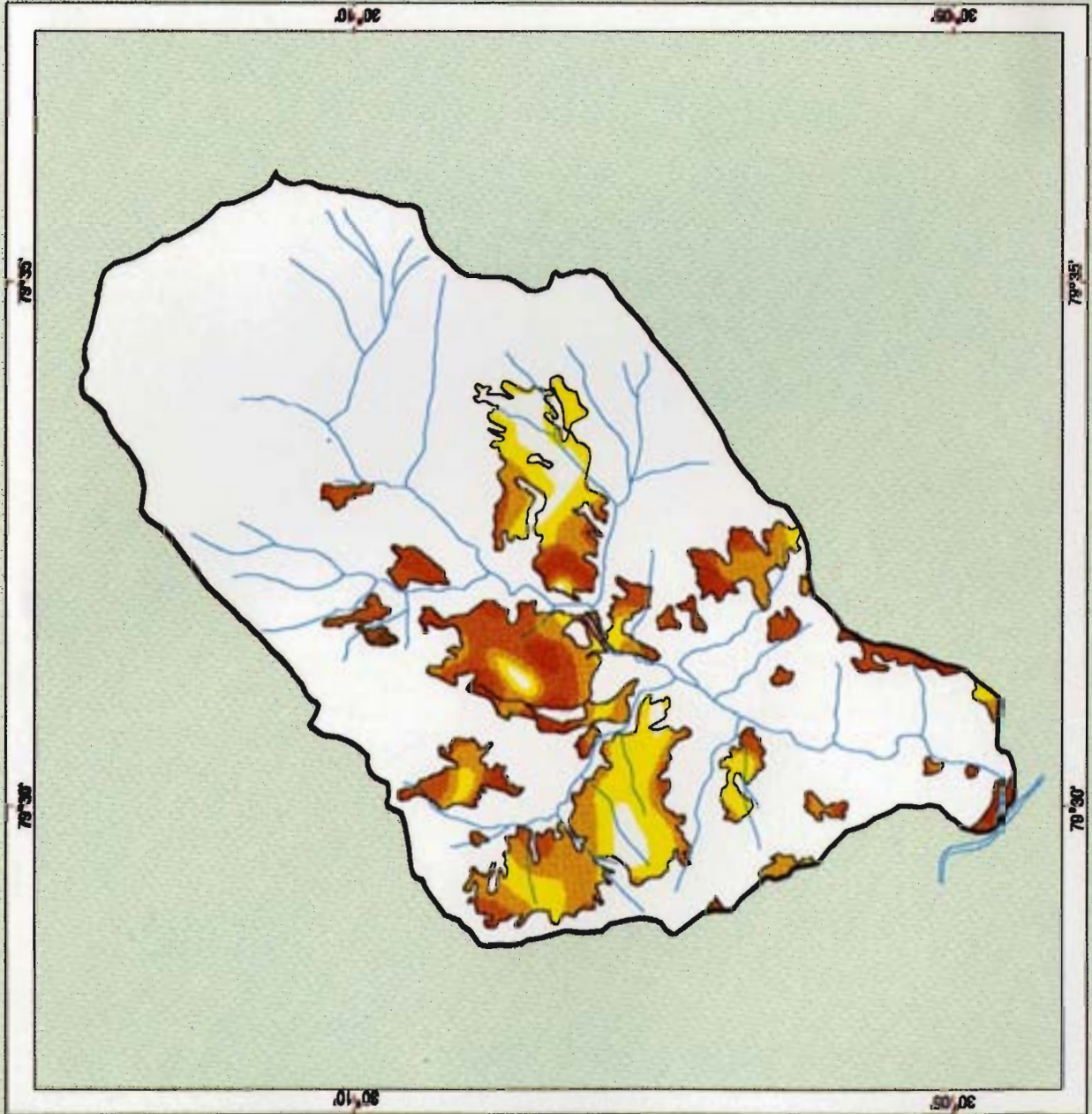
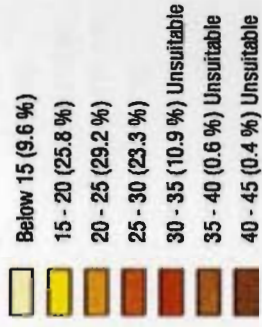
-  (Based on 1983-94 survey: elevation in metres)
Potatoes (2400-2600 m)
-  'Chua' (& Rajma) and Potato-Wheat/Mustard
(2200-2400 m)
-  'Chua-Mandua' ('Bhat/Soya')-'Jhangora', and
Potato-Wheat/'Owa/'Jow' (& Mustard)
(1850-2200 m)
-  Rice-'Jhangora'; 'Mandua' ('Bhat/Soya')
and Wheat (& Mustard)/'Owa/'Jow'
(1600-1850 m)
-  'Mandua'; 'Jhangora' and Wheat
(below 1600 m)



Map 17

Pranmati Watershed
Garhwal Himalayas, India
Agricultural Land in
Different Slope Classes (1993)

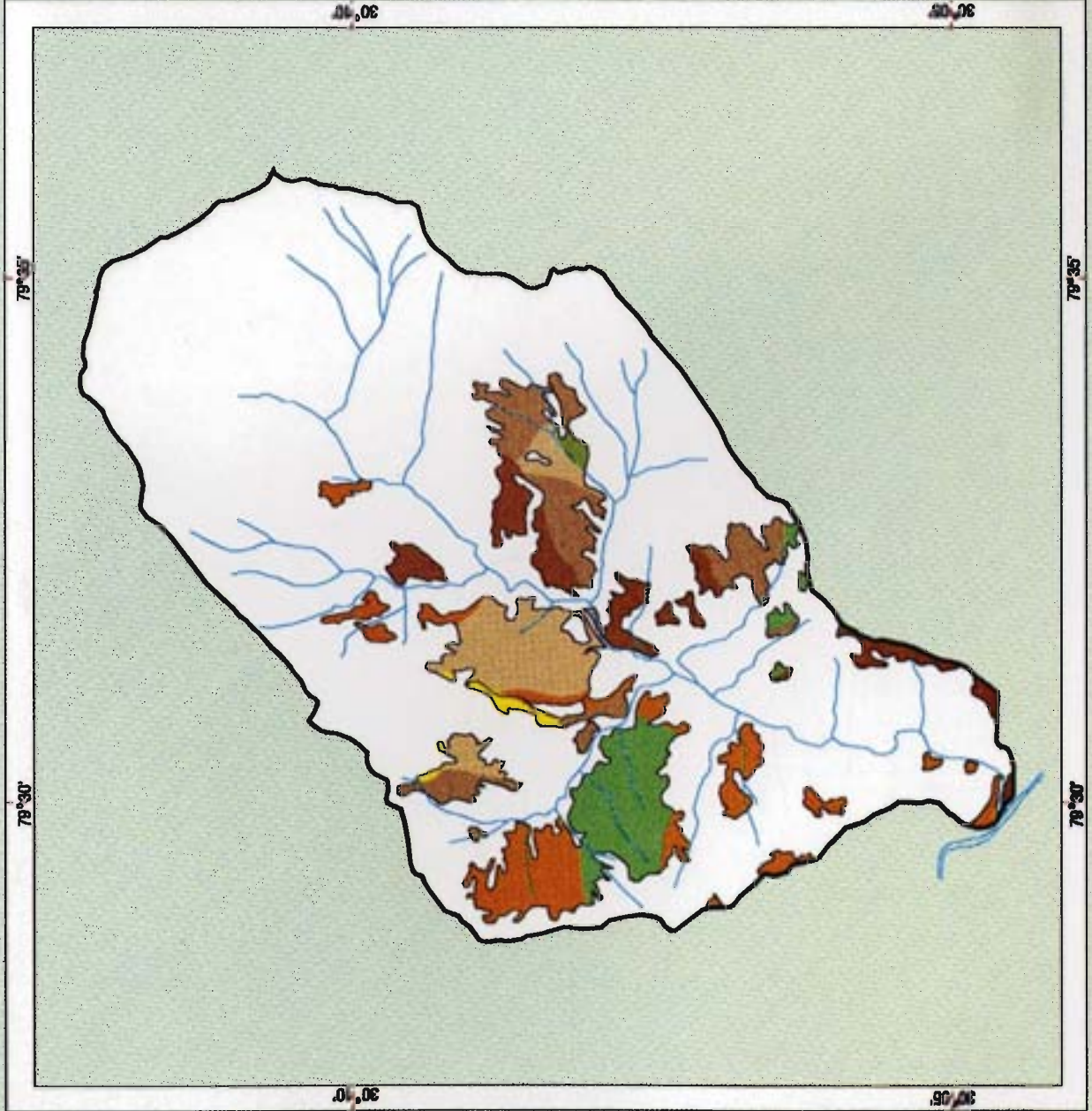
LEGEND



Map 18

Pranmati Watershed
Garhwal Himalayas, India
Agricultural Land on
Different Slope Aspects (1993)

LEGEND

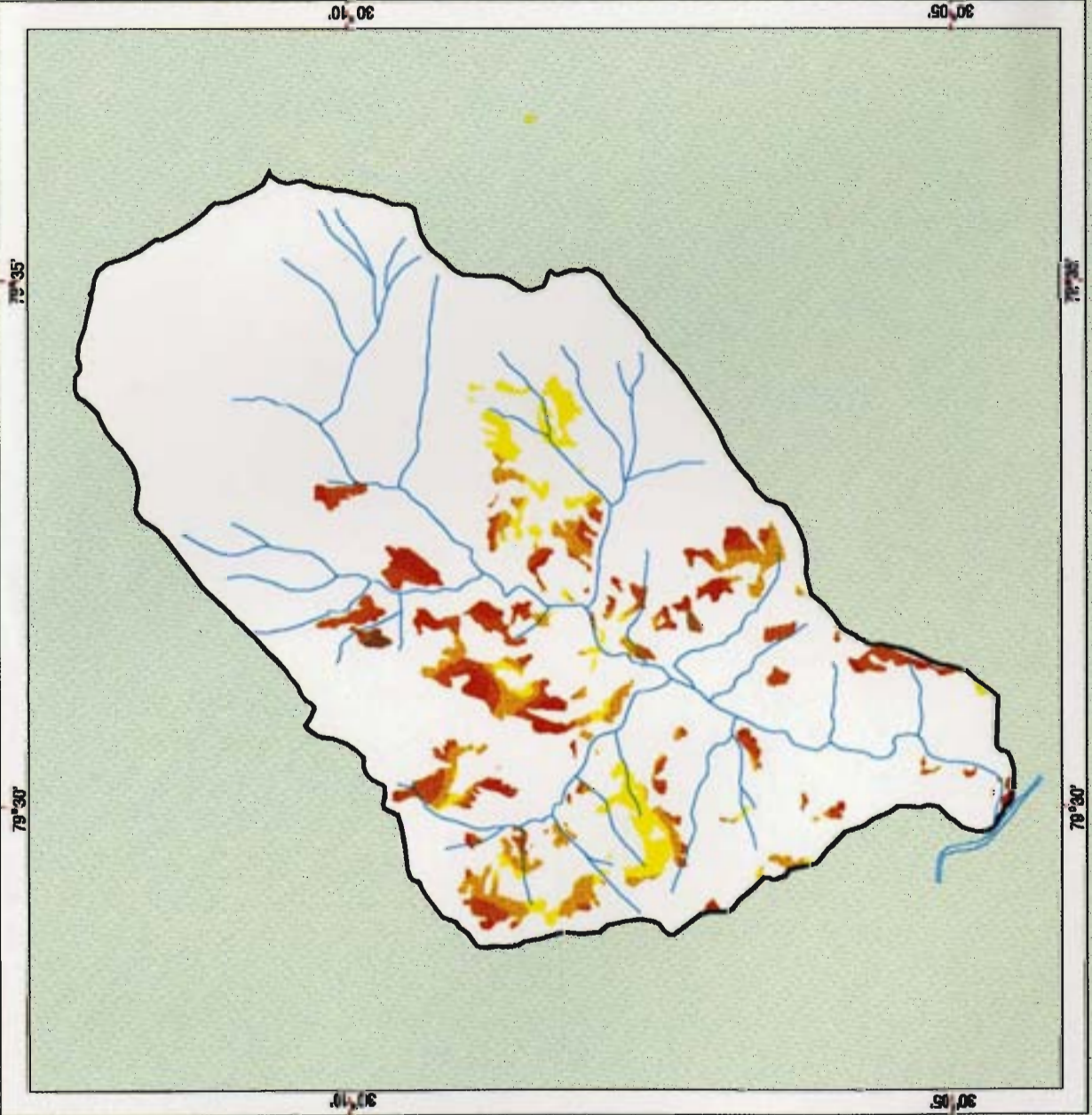
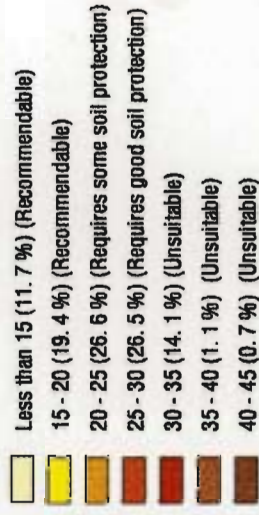


Map 19

Pranmati Watershed
Garhwal Himalayas, India

Extension of Agriculture in
Different Slope Classes (1963-93)

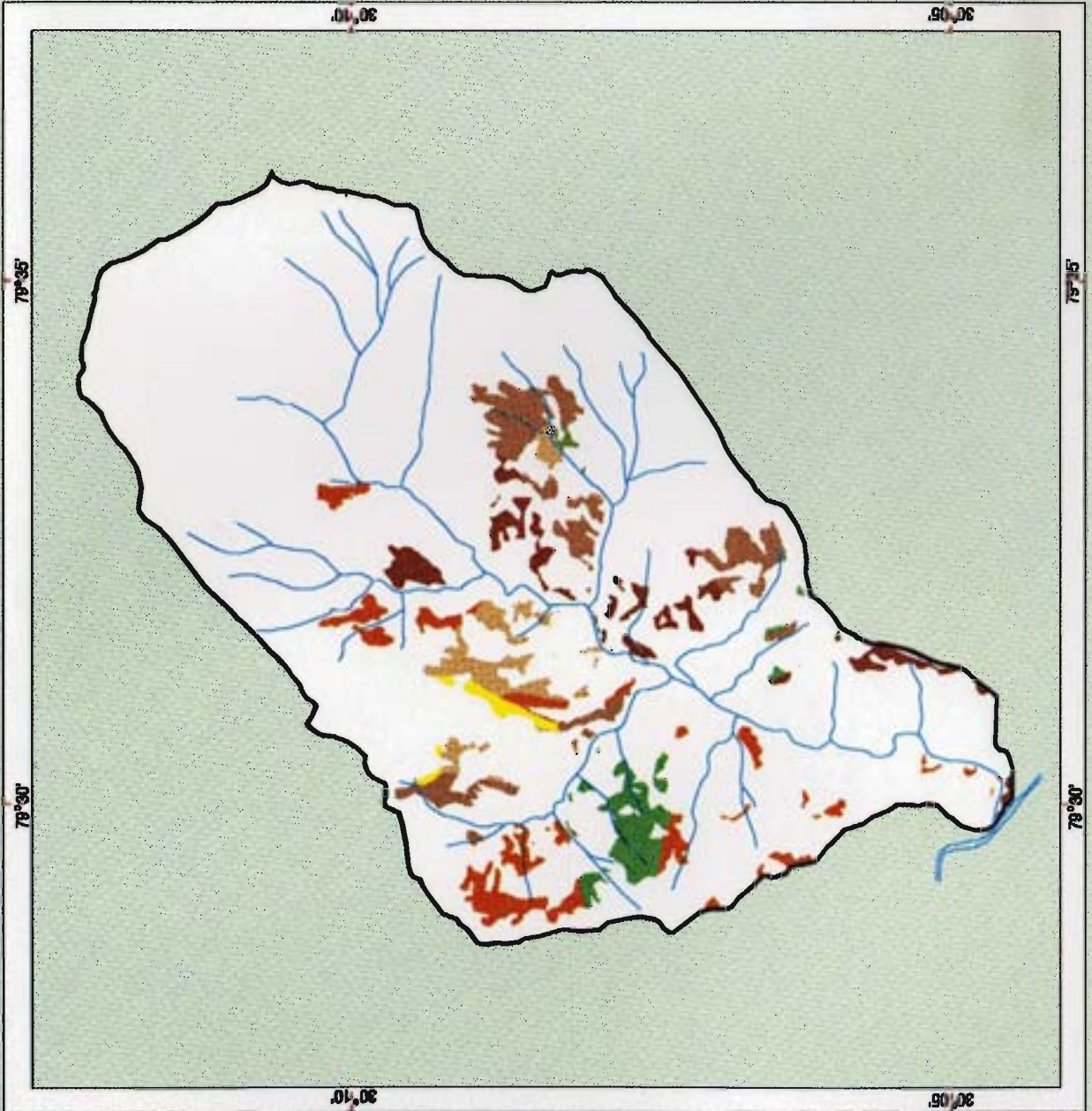
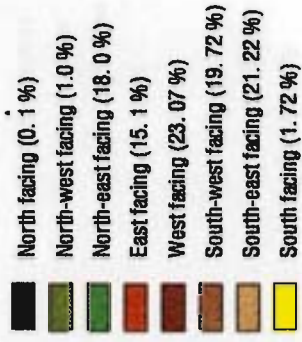
LEGEND (Slope in degrees)



Map 20

Pranmati Watershed
Garhwal Himalayas, India
Extension of Agriculture on to
Different Slope Aspects (1963-93)

LEGEND










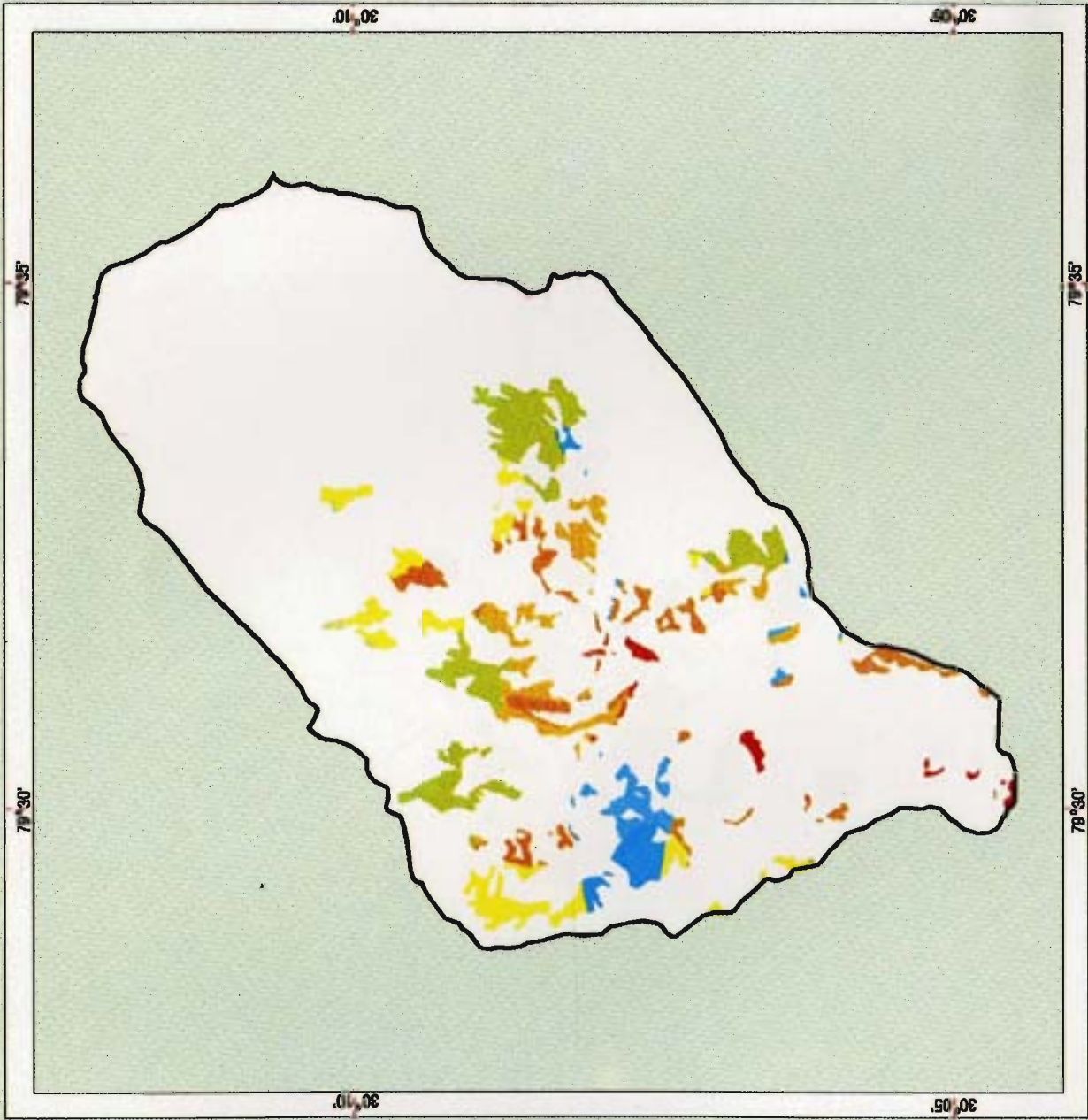
Map 21

Pranmati Watershed
Garhwal Himalayas, India

Agricultural extension in different
Bioclimatic Zones (1963-93)

LEGEND

-  Cool moist, alpine meadows
-  Warm dry, alpine meadows
-  Warm moist, alpine meadows
-  Cool moist, sub-alpine
-  Warm dry, sub-alpine
-  Warm moist, sub-alpine
-  High elevation, moist cool
-  High elevation, warm dry
-  High elevation, warm moist
-  Mid-elevation moist cool
-  Mid-elevation warm dry
-  Mid-elevation warm moist
-  Low elevation, moist cool
-  Low elevation, warm dry
-  Low elevation, warm moist
-  Warm moist, riverine valley



Map 22

Pranmati Watershed
Garhwal Himalayas, India
Soil Types in Agricultural Land

LEGEND (Soil Depth-Texture)

VERY HIGH DEPTH SOIL TYPES (>80 cm)

- Clayey Loam
- Sandy Clay Loam
- Sandy Loam to Loamy Sand

HIGH DEPTH SOIL TYPES (50-80 cm)

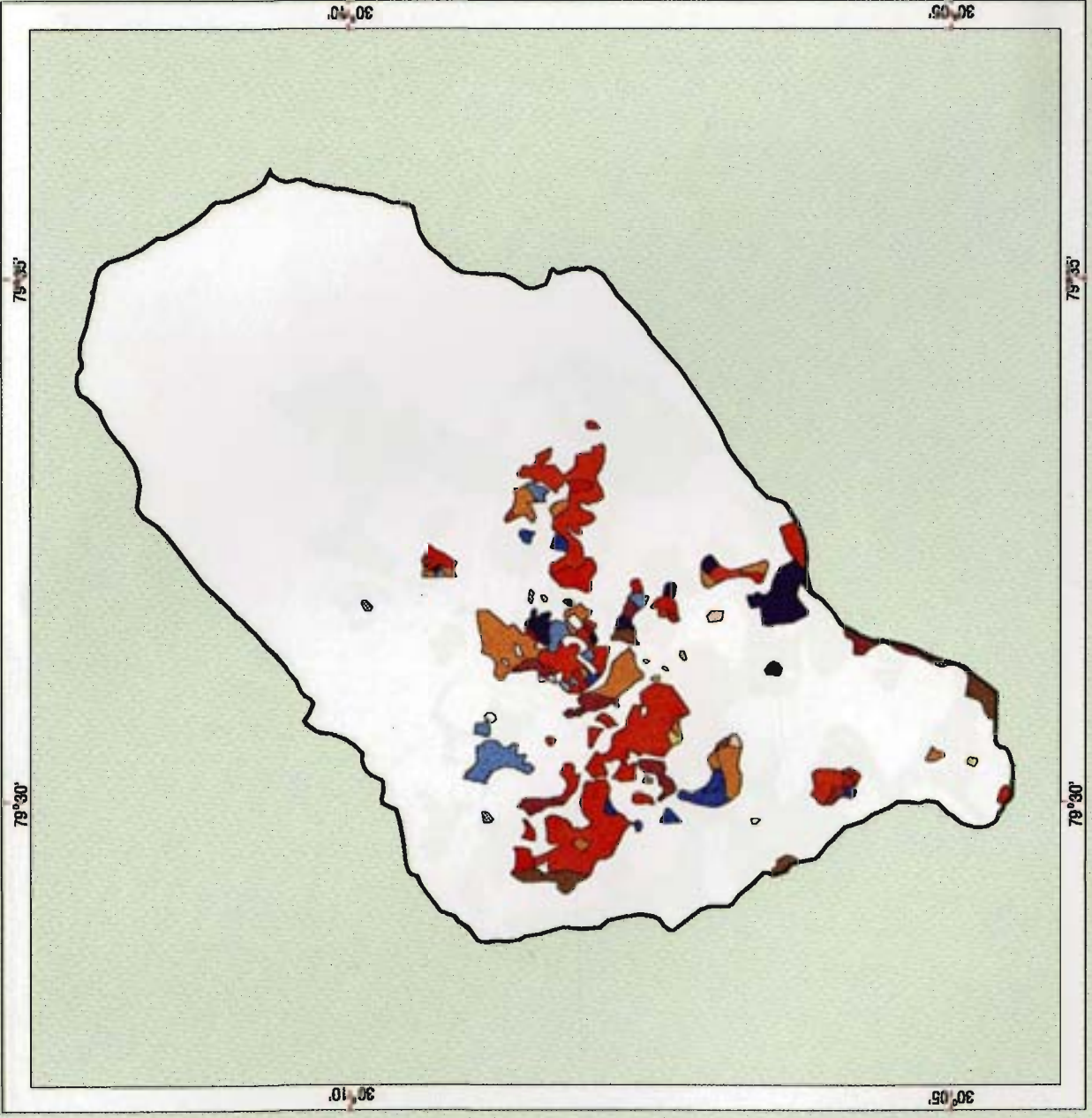
- Clayey Loam
- Sandy Clay Loam
- Sandy Loam to Loamy Sand
- Sandy Soil

MEDIUM DEPTH SOIL TYPES (20-50 cm)

- Clayey Loam
- Sandy Clay Loam
- Sandy Loam to Loamy Sand
- Sandy Soil

SHALLOW DEPTH SOIL TYPES (<20 cm)




- Clayey Loam
- Sandy Loam to Loamy Sand



Map 23

Pranmati Watershed
Garhwal Himalayas, India
Areas Viable to Agricultural Extension

LEGEND

-  Currently under dense forest
(should be safeguarded against encroachment)
-  Currently under degraded forest
(should be kept under strict surveillance to
prevent encroachment and misuse)
-  Currently not under Forest
(fallow or pasture land that may be
cultivated depending on soil conditions)



Map 24

Pranmati Watershed
Garhwal Himalayas, India
Proposed and Operational
Micro Hydel & Water Mills

LEGEND

-  Operating Micro hydel
-  Proposed Micro hydel
-  Water mills (traditional)
-  Springs
-  Perennial streams
-  Seasonal streams

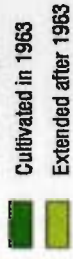


Map 25

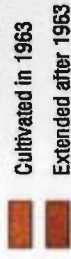
Pranmati Watershed
Garhwal Himalayas, India
Suitability Classes of Agricultural Land

LEGEND

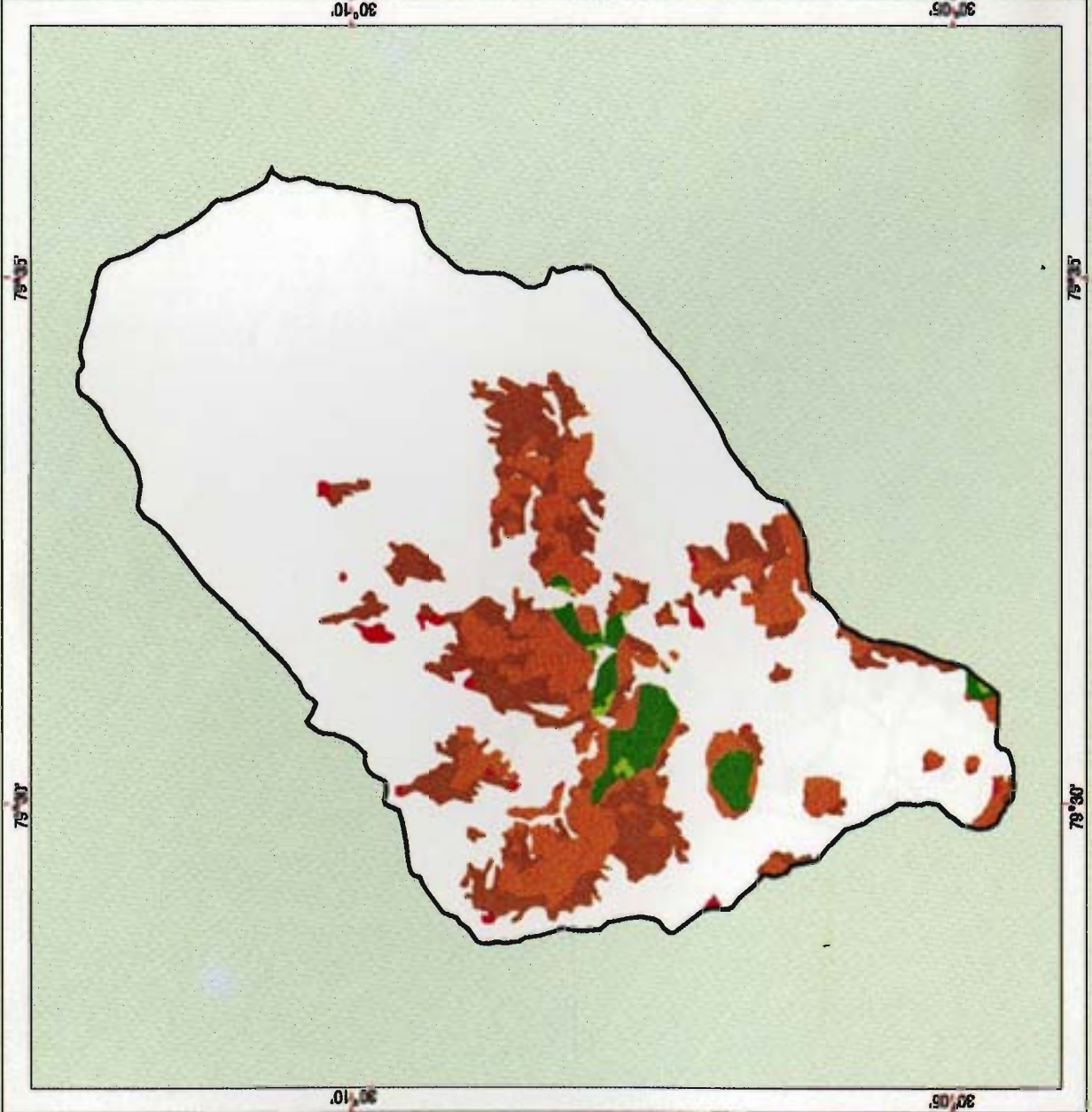
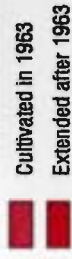
CLASS-1 SUITABLE
(Below 2,200 m elevation with average slopes below 20 degrees)



CLASS-2 MODERATELY SUITABLE
(Average slopes 20-30 degrees at any elevation, high elevation, gently sloping land and low elevation 30-35 degree sloping land)



CLASS-3 UNSUITABLE
(Above 2,600 m with average slopes above 30 degrees and all land with average slopes above 35 degrees)



Map 26

Pranmati Watershed
Garhwal Himalayas, India
Schools & Hospitals (1993)

LEGEND

- ★ Primary school
- ◇ Modern primary school
- ▲ Junior high school
- High school
- ▢ Intermediate college
- ▣ Anganbari
- ⊕ Hospital

