

# Lands can be used for...

- Agricultural uses
- Non- Agricultural uses

## Agriculture uses

- 1) Highland Agriculture (Rainfed/Irrigated)
  - 1.1 Permanent crops (Plantation crops, Fruit crops)
  - 1.2 Temporary crops/Seasonal crops
  - 1.3 Animal Husbandry

## 2) Low land Agriculture

### 2.1 Paddy (Rainfed/Irrigated)

### Non-Agricultural uses

- 1) Housing
- 2) Industry
- 3) Tourism
- 4) Services including urban uses etc...

# As a principle we all agreed the following.....

- *The best land for agriculture should not be used for non-agricultural uses.*
- *Lands that are marginally suitable or unsuitable for agriculture could either be used for non- agricultural uses or animal husbandry.*

# Then how we can determine the suitability of a particular land/site?

- First we should see whether the land or site is capable to support agriculture.
- If the land is capable to support agriculture we can evaluate the land /site for specific agricultural use (selection of “**Land Utilization Types**” for a particular land)

There are different methods adopted to determine the appropriate use for a particular land.

- 1) **Land Capability Classification** – Based mainly on permanent limitations for agriculture
- 2) **Land Suitability Ranking (Land Evaluation)** – Based mainly on soil factors
- 3) **Site Assessment** – Based mainly on non soil factors

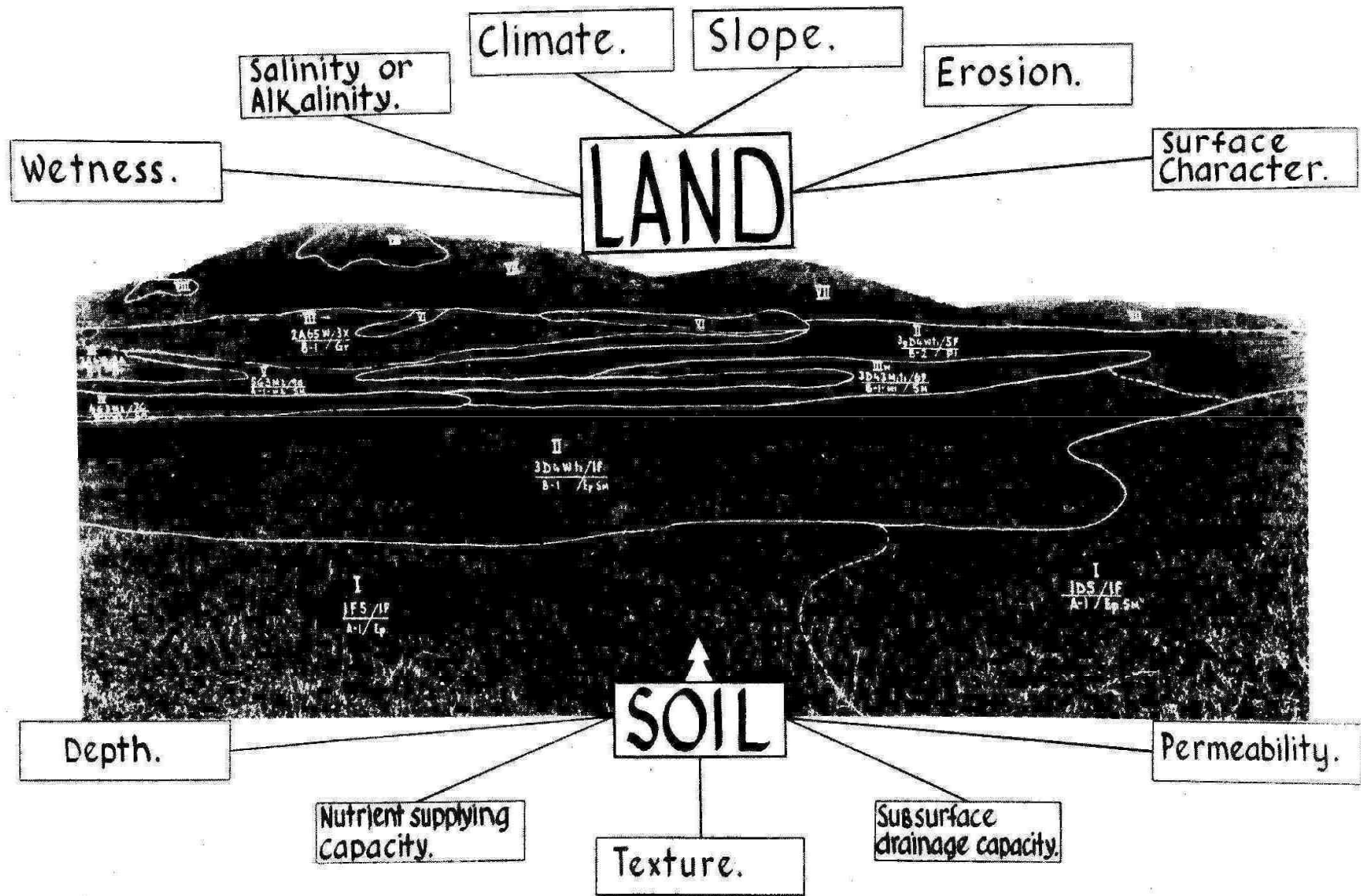


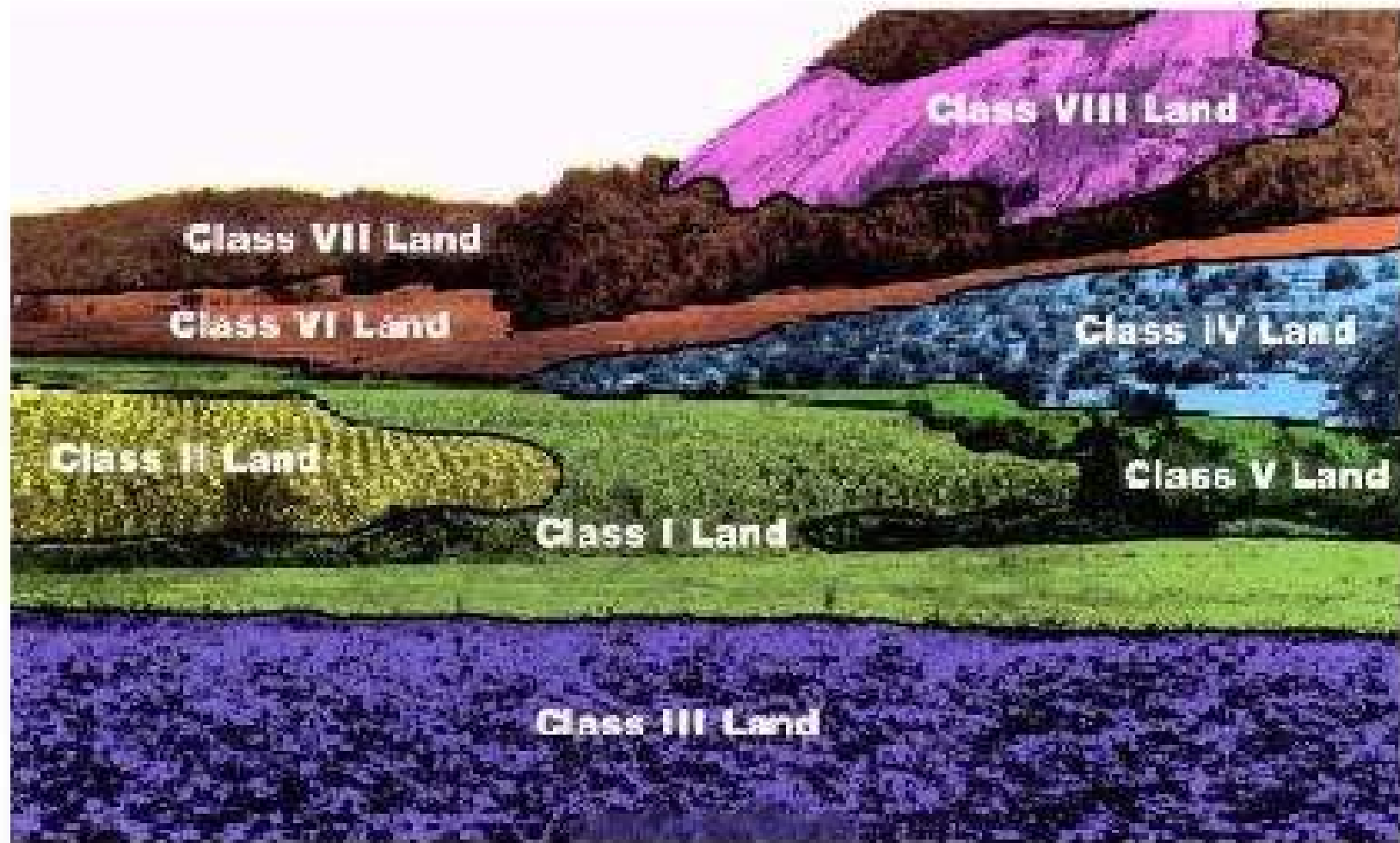
# Land Capability Classification

The main product of land capability classification is a map in which areas of land are put into capability classes ranging from I (best) to VIII (worst).

There are basically three land capability classification methods.

- 1) The American Method (USDA Method)- 8 classes
- 2) The Canadian Method- 7 classes
- 3) The British Method- 7 classes





**Landscapes with land capability classes outlined.**

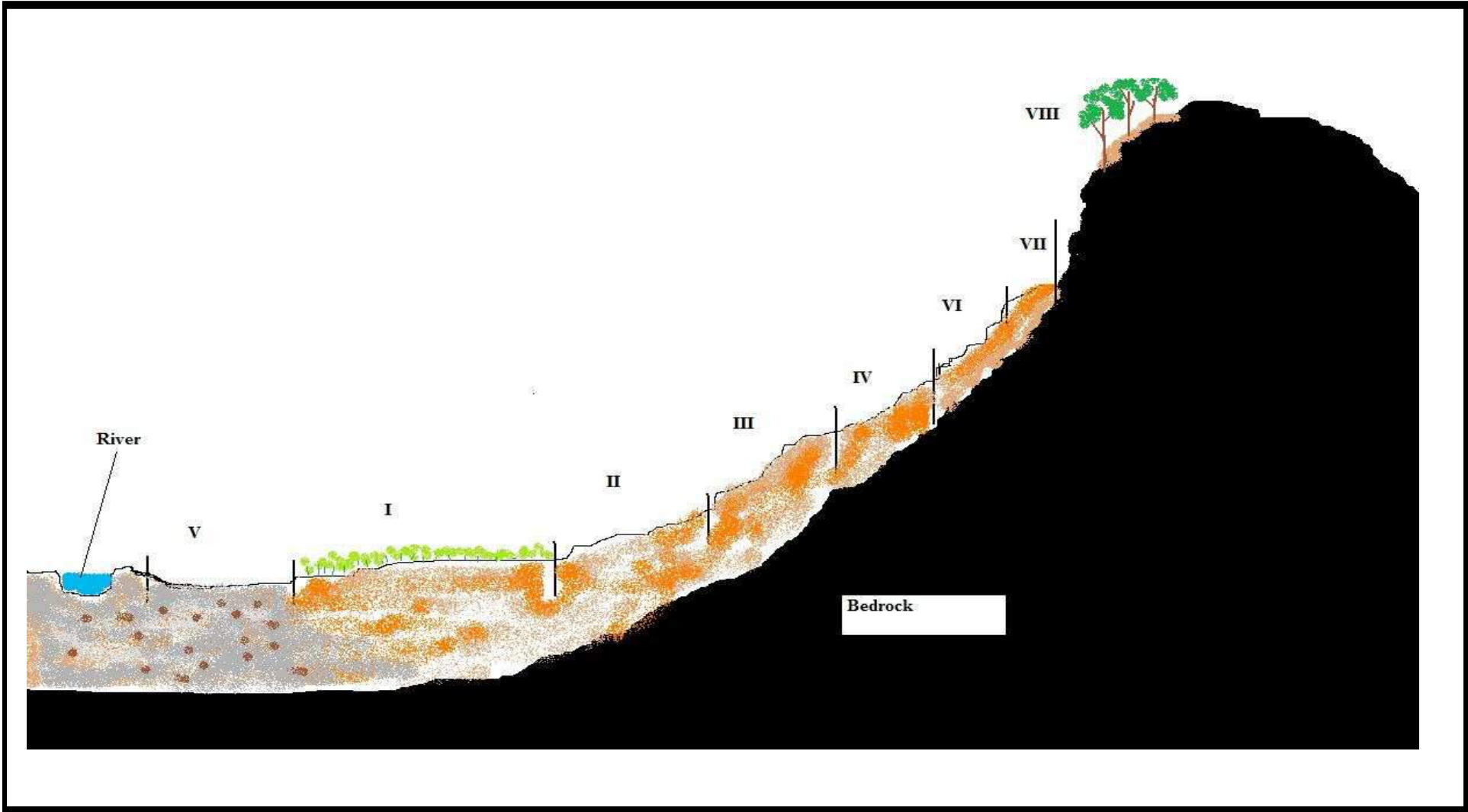


# Cloud Peak Wilderness, Bighorn Mts, Wyo.

Class VIII →

Class VII →





<b>Land Capability Class</b>	<b>Degree of Limitations</b>	<b>Capability</b>	<b>Example</b>
<b>I</b>	Not significant	For all land uses, with normal land management practices	Flat, well drained and fertile land
<b>II</b>	Little	For all land uses, but moderate conservation practices for annual crops	Gently sloping and slightly eroded lands
<b>III</b>	Moderate	For all land uses, but intensive conservation practices for annual crops	Sloping and moderately eroded lands
<b>IV</b>	Moderately severe	For all land uses, but annual crops on occasional basis only with intensive conservation practices	Moderately steep and moderately eroded lands
<b>V</b>	Severe	???????	Valley floor, swampy or frequent flooding areas
<b>VI</b>	Severe	For pasture and perennial crops with moderate conservation practices and forestry	Moderately steep, stony and eroded lands
<b>VII</b>	Very severe	For forestry only	Steep, stony and eroded lands
<b>VIII</b>	Extremely severe	Very extensive utilization only (reservation/ wildlife)	Very fragile lands

# 1) American Method (USDA) of land capability classification

**Class I** – Soils with few limitations that restrict their use. With good management it is suitable for long continued cropping with no or only simple conservation practices.

Soils – Very deep to Deep soil

- Well drained
- With stable structure with good working properties.
- Slopes are slight

Limitations – Maintenance of soil structure and fertility



**Class I Land in Attanagalla Division in Gampaha District**



Same Land in different view



Same Land in different view



*Class I land on alluvial soil (Taree, NSW) used for vegetable production*



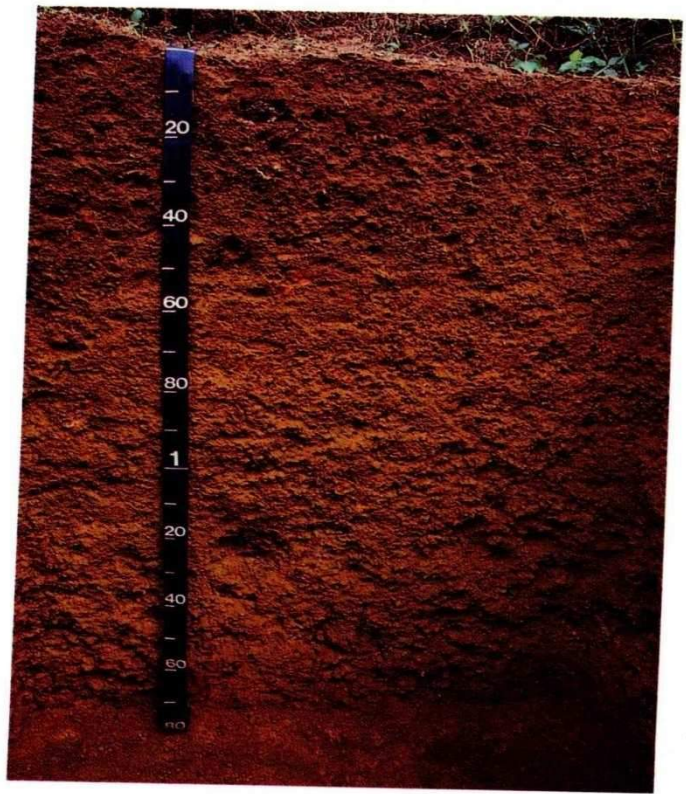


*Class I land: Irrigated lucerne on alluvial terraces, Scone N.S.W.*



Class I ? Or  
Class II?

Think about  
it.....



Ap1 0-5 cm

ABc 5-50 cm

Btc1 50-93/125 cm

Btc2 93/125-163 cm

Btv3 163-188 cm

Plate 9. Landscape and soil profile of Boralu Series

**Class II** – Soils with some (moderate) limitations that reduce the choice of plants or require moderate conservation practices.

Limitations:

- Moderate susceptibility to erosion.
- Slight or Moderate slopes
- Moderately deep soil depth
- Slightly unfavorable surface physical characteristic.



**Tea land at Matale. It probably class II land.**

**Another view of the same land**



**Class III** – Soils with severe limitations that reduce the choice of plants or require special conservation practices, or both.

### Limitations

- Sloping lands
- High susceptibility to erosion
- Low moisture retaining capacity
- Moderately shallow and shallow soils
- Inadequate permeability in lower root zone
- Unfavorable physical characteristics in the surface soil of moderate wetness.



250







**Class IV** – Soils with very severe limitations that restrict the choice of plants, require very careful management, or both.

### Limitations

- Moderately steep slopes
- Shallow soils or with very low water retaining capacity
- High erodibility
- Unfavorable characteristics in the surface soil

**Class V** – Soils with little or no erosion hazard, but with other limitations impractical to remove, that limit their use largely to pasture, range, woodland or wildlife

In practice this class is mainly used for level valley-floor lands that are swampy or subject to frequent flooding.

Valleys and water courses subject to severe wetness not usually corrected and best left under permanent vegetation.



Apg1 0-20 cm

Apg2 20-37 cm

Cg1 37-61/69 cm

Cg2 61/69-75 cm

Cg3 75-110 cm

Cg4 110-140+ cm

Plate 4. Landscape and soil profile of Madabokka Series

**Class VI** – Soils with very severe soil and/or slope limitations that make them generally unused to cultivation and limit their use largely to pasture or range, woodland or wildlife.

### Limitations

- Moderately steep to steep slopes
- Very shallow soil
- Physical hazards of rock outcrops, unevenness etc.

**Class VII** – Soils with very severe limitations. Unsuitable for cultivation.

Limitations are similar but more severe than those limiting class VI



**This land belongs to Hurigaswewa temple in Thabuththegama. Class VI**



**CLASS VII – Rough grazing land**



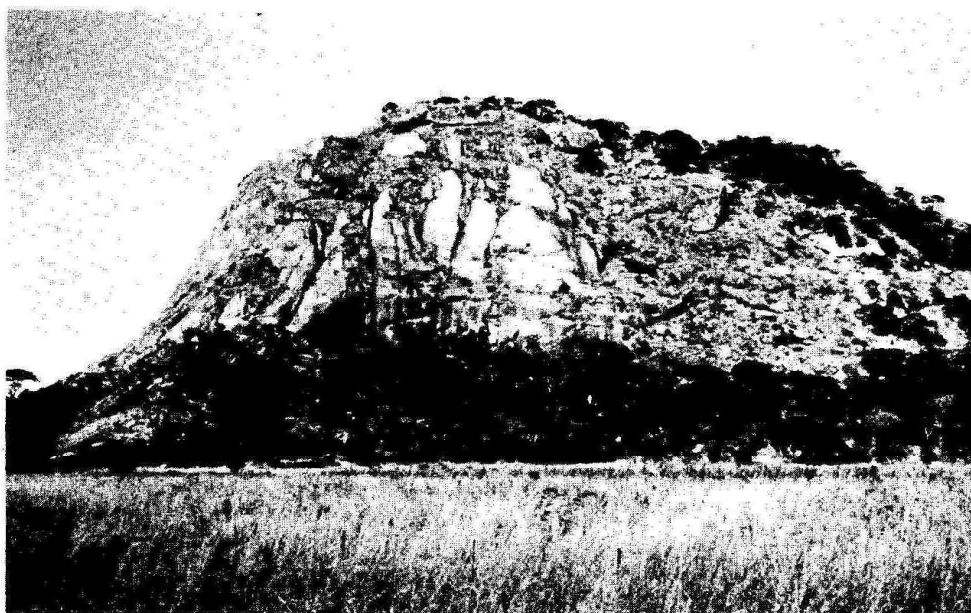
**Class VIII** – Soils and landform with severe limitations. Use restrict to recreation, wildlife, aesthetic purposes.

Appropriate uses for the capability classes

Class I lands can be put to arable use without soil conservation methods

Class II to IV can be put to arable use but need increasingly costly conservation practices.

Class VI to VIII should not be put to arable use at all.



**CLASS VIII**

**Non- Agricultural land**

CAPABILITY CLASS		INCREASE IN INTENSITY OF LAND USE →							
		WILDLIFE	FORESTRY	GRAZING			CULTIVATION		
				LIMITED	MODERATE	INTENSE	LIMITED	MODERATE	INTENSE
I	II	III	IV	V	VI	VII	VIII		

INCREASE LIMITATIONS AND HAZARDS ↓

**This land is not good for agriculture. Is it good for housing?**



Now you just have an idea about the land capability and the appearance of the agriculturally capable lands and lands which are good for non agricultural use.

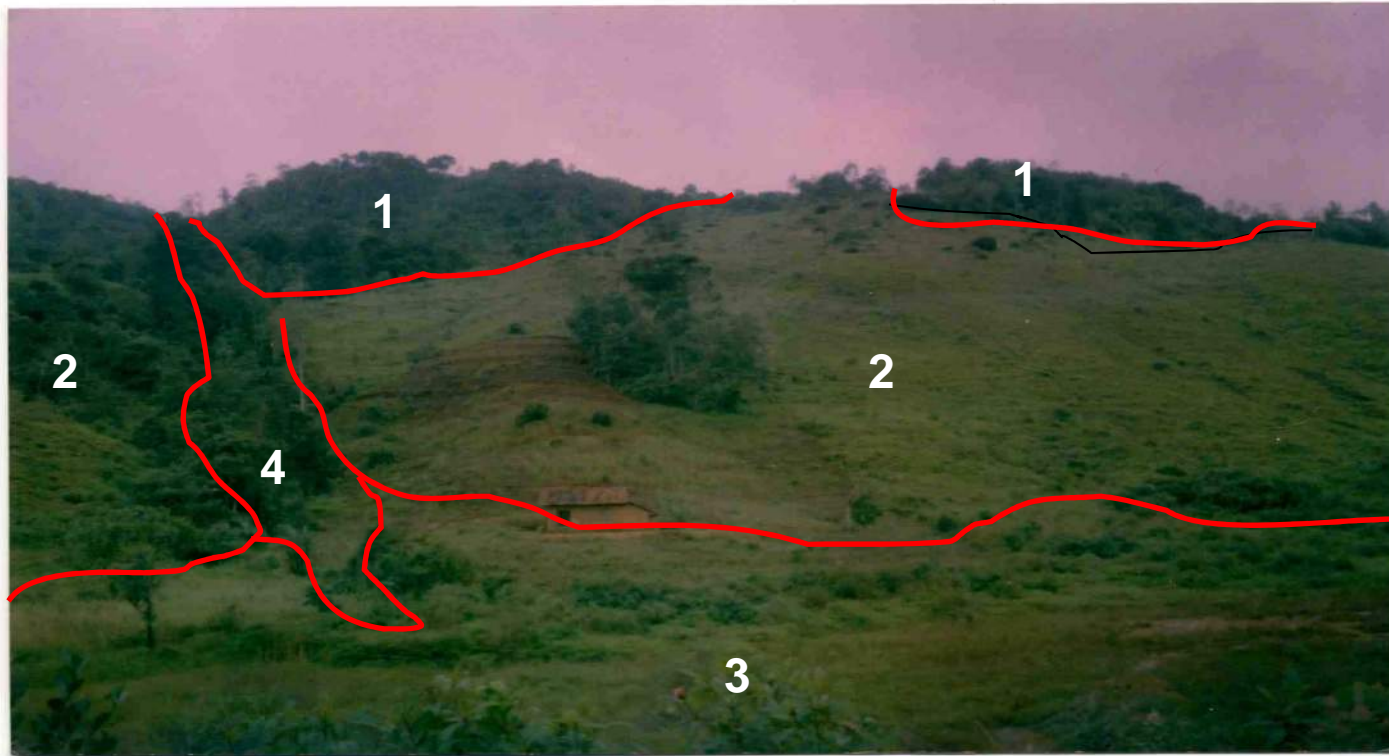
Now we see how to do the land capability classification for the lands which will be identified under our work programme.

# How can we do the capability classification for unused lands?

- First step - We should identify different land units based on the topography (maps can be made)
- Second step – We should identify the permanent limitations associated with different land units.
- Enter the limitations into a table and determine the capability class based on the severity of limitations of particular land unit.
- If necessary determine the sub classes.
- Prepare final land capability map.
- This will help to classify the unused land for agricultural use and non agricultural use.

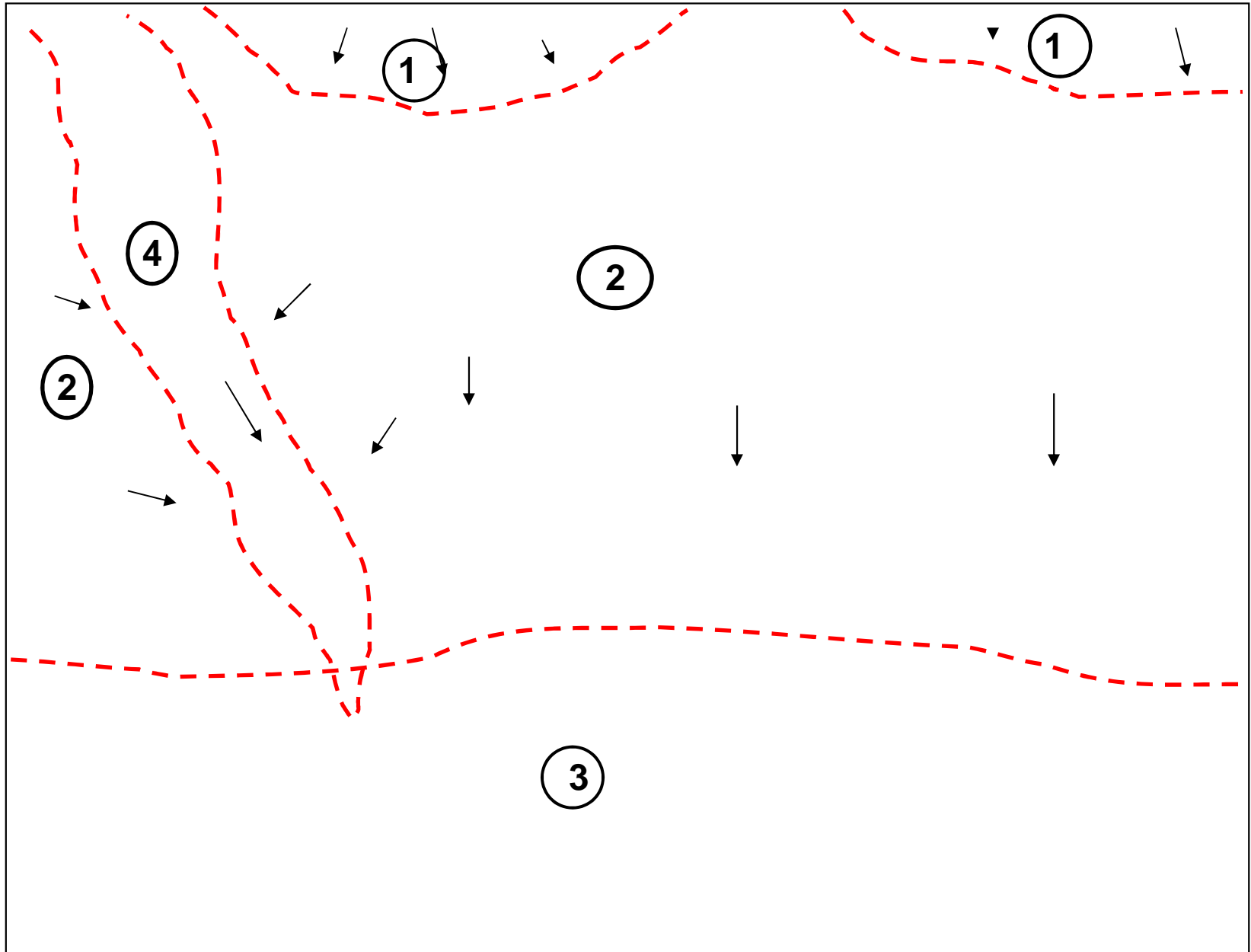


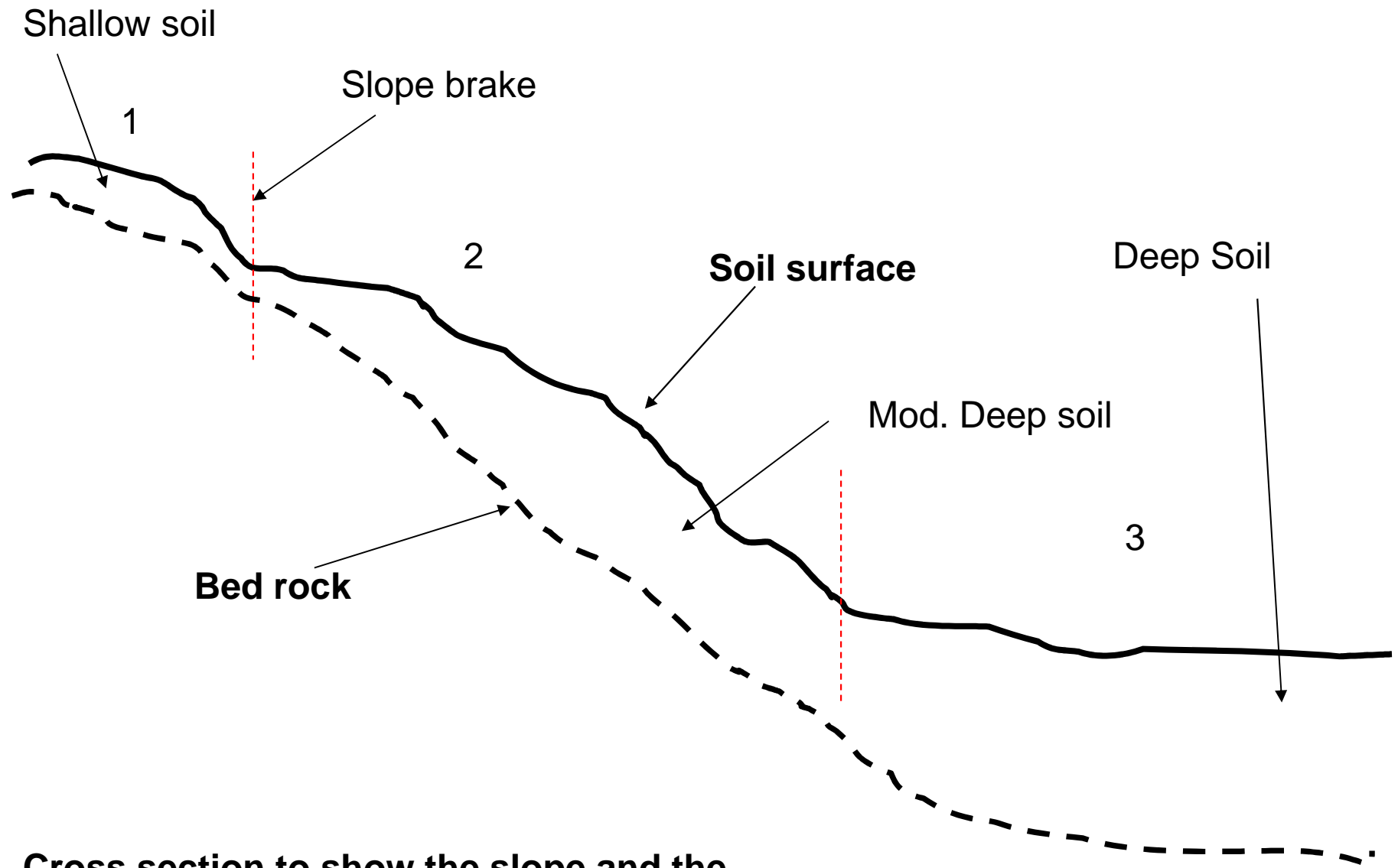
**Bird's eye view (oblique) of a landscape to show land units demarcated based on topography.**



**This land is situated in Kolonna DS Division (Ratnapura District).**







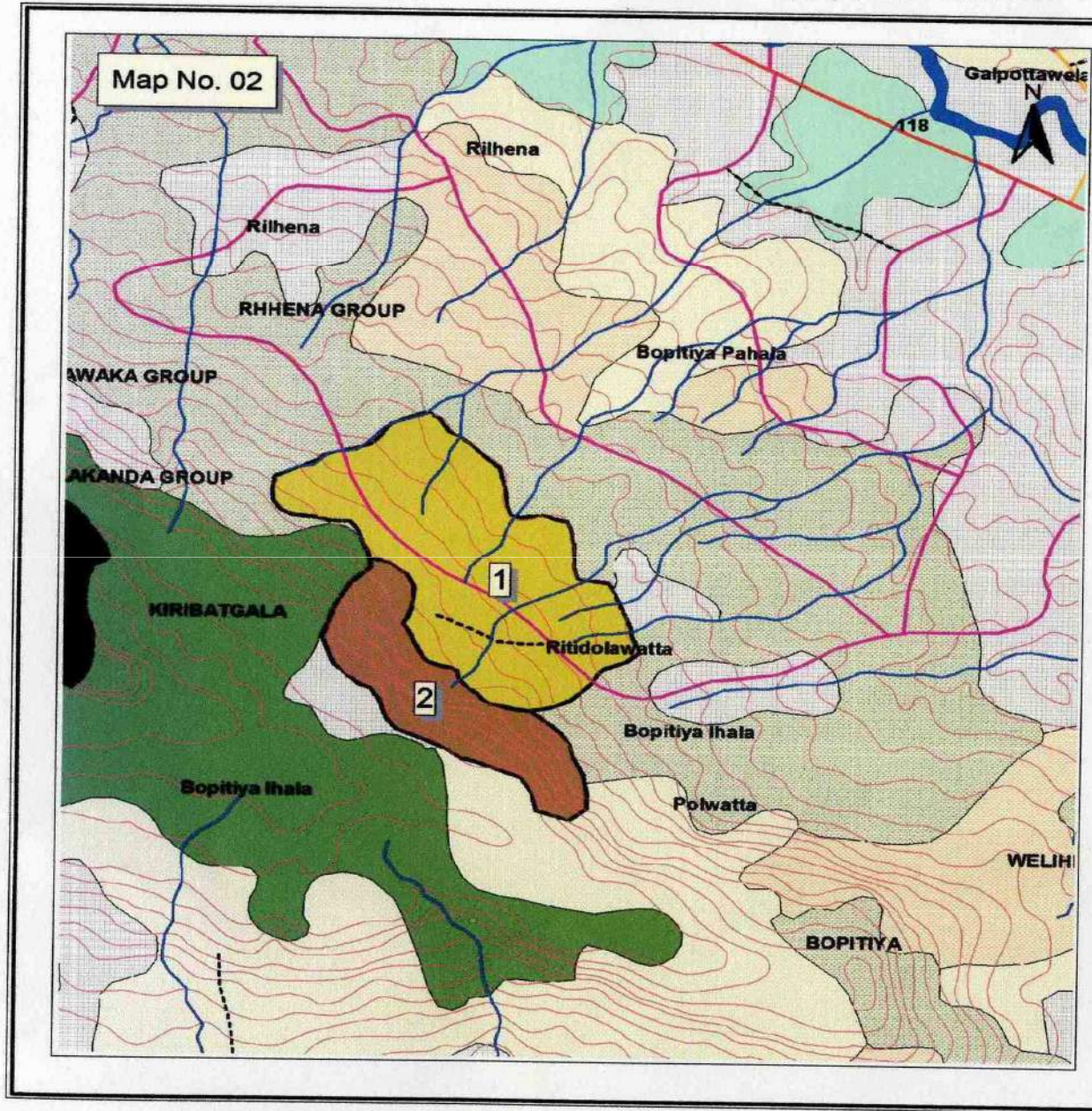
**Cross section to show the slope and the soil depth of the same land.**

## What are the limitations for agriculture in each land unit?

LIMITATIONS	LAND UNITS			
	1	2	3	4
Shallow soil	H	M	L	H
Erosion Hazard	H	M	L	H
Rocks	H	M	L	H
Poor Drainage	L	M	M	M
Excessive Drainage	H	M	L	H
Soil texture	H	M	L	H
Limitations for Workability	H	M	L	H
	CLASS VI	CLASS IV	CLASS II	CLASS VII

H= Limitations are high, L= Low, M=Moderate

map showing division 4 Riiena plantation - Ihala bopitiya G.N.division - P



**Limitations and there magnitude of the Unit 1 and 2**

Limitations	Magnitude of the limitations	
	Unit 1	Unit 2
Slope steepness Drainage condition Soil depth Rockiness	Moderate Low Low Moderate	High High High Moderate to High
<b>Capability class</b>	<b>II</b>	<b>VI</b>

Slope \ Soil depth	1. Gently sloping < 7°	2. Moderately sloping 7°-15°	3. Strongly sloping 15°-20°	4. Very strongly sloping 20°-25°	5. Steep 25°-30°	6. Very steep > 30°
Deep (D) > 36 in ( > 90 cm )	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	FT	P
Moderately deep (MD) 20-36 in ( 50-90 cm )	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub> P	FT P	P
Shallow (S) 8-20 in ( 20-50 cm )	C <sub>1</sub>	C <sub>2</sub> P	C <sub>3</sub> P	P	P	P
Very shallow (VS) < 8 in ( < 20 cm )	C <sub>1</sub> P	P	P	P	P	P

Criteria for classifying lands according to their suitability for tea-  
single limitations (TRI Advisory circular, 2002)

Agro-eco. Region (climate)	Limiting Factor				Degree of Limitation
	Slope(%)	Soil Depth (cm)	Surface rockiness (%)	Gravel (vol. % in top 50 cm)	
<b>WU2,3,IU2,3</b> <b>IU1</b> <b>All other up country regions</b>	<b>0-25</b> <b>25-70</b> <b>&gt;70</b>	<b>&gt;90</b> <b>70-90</b> <b>&lt;70</b>	<b>0-10</b> <b>10-20</b> <b>&gt;20</b>	<b>0-10</b> <b>10-50</b> <b>&gt;50</b>	<b>None</b> <b>Moderate</b> <b>Severe</b>
<b>WM3</b> <b>WM2,IM2</b> <b>All other mid country regions</b>	<b>0-25</b> <b>25-55</b> <b>&gt;55</b>	<b>&gt;90</b> <b>70-90</b> <b>&lt;70</b>	<b>0-10</b> <b>10-20</b> <b>&gt;20</b>	<b>0-10</b> <b>10-50</b> <b>&gt;50</b>	<b>None</b> <b>Moderate</b> <b>Severe</b>
<b>WL1</b> <b>WL2</b> <b>All other low country regions</b>	<b>0-25</b> <b>25-70</b> <b>&gt;70</b>	<b>&gt;90</b> <b>70-90</b> <b>&lt;70</b>	<b>0-10</b> <b>10-20</b> <b>&gt;20</b>	<b>0-10</b> <b>10-50</b> <b>&gt;20</b>	<b>None</b> <b>Moderate</b> <b>Severe</b>

Criteria for classifying lands according to their suitability for tea-dual moderate limitations

<b>Moderate limitations</b>	<b>Climate</b>	<b>Slope</b>	<b>Soil depth</b>	<b>Surface rockiness</b>	<b>Gravel</b>
<b>Climate</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 3</b>	<b>Class 3</b>
<b>Slope</b>	<b>Class 3</b>	<b>Class 2</b>	<b>Class 4</b>	<b>Class 3</b>	<b>Class 3</b>
<b>Soil depth</b>	<b>Class 4</b>	<b>Class 4</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>
<b>Surface rockiness</b>	<b>Class 3</b>	<b>Class 3</b>	<b>Class 3</b>	<b>Class 2</b>	<b>Class 3</b>
<b>Gravel</b>	<b>Class 3</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 3</b>	<b>Class 2</b>

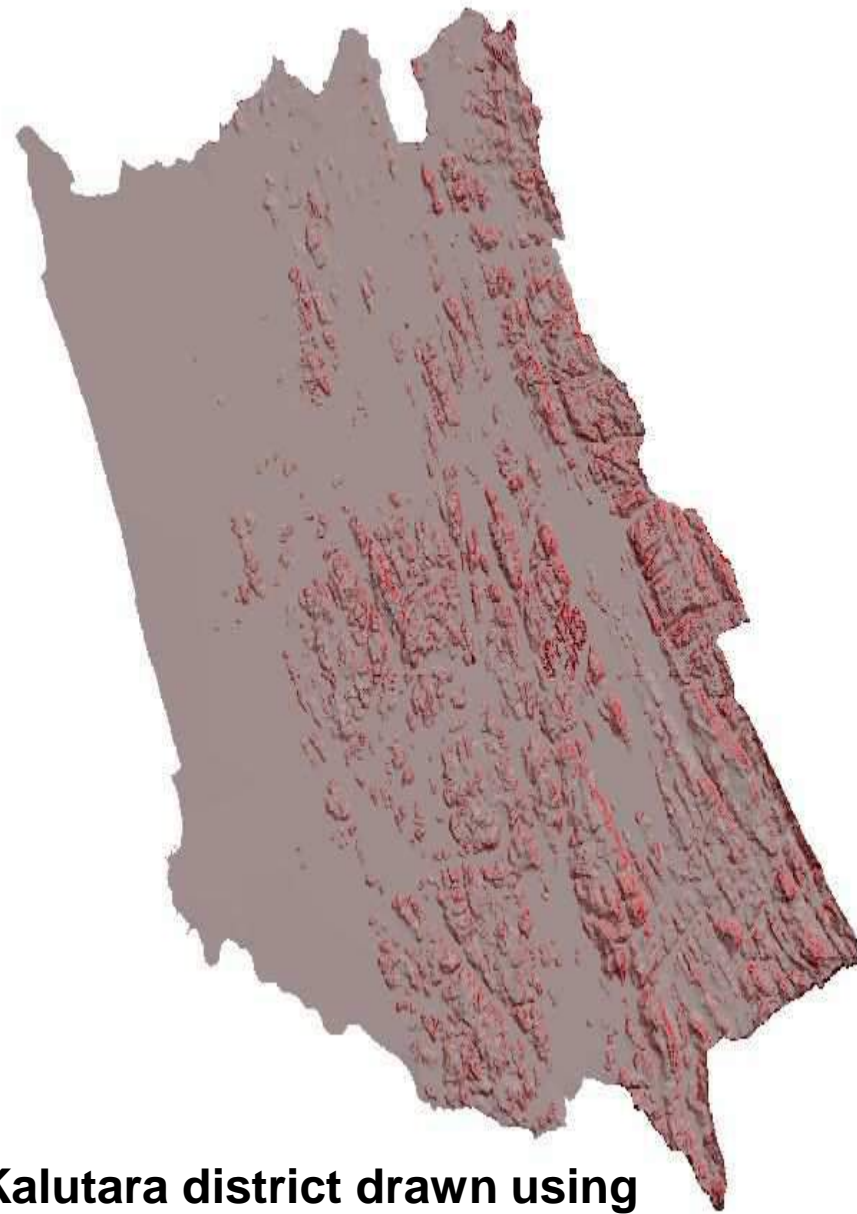
Class 1 – Highly suitable, Class 2 – Suitable

Class 3 – Moderately suitable, Class 4 - Unsuitable

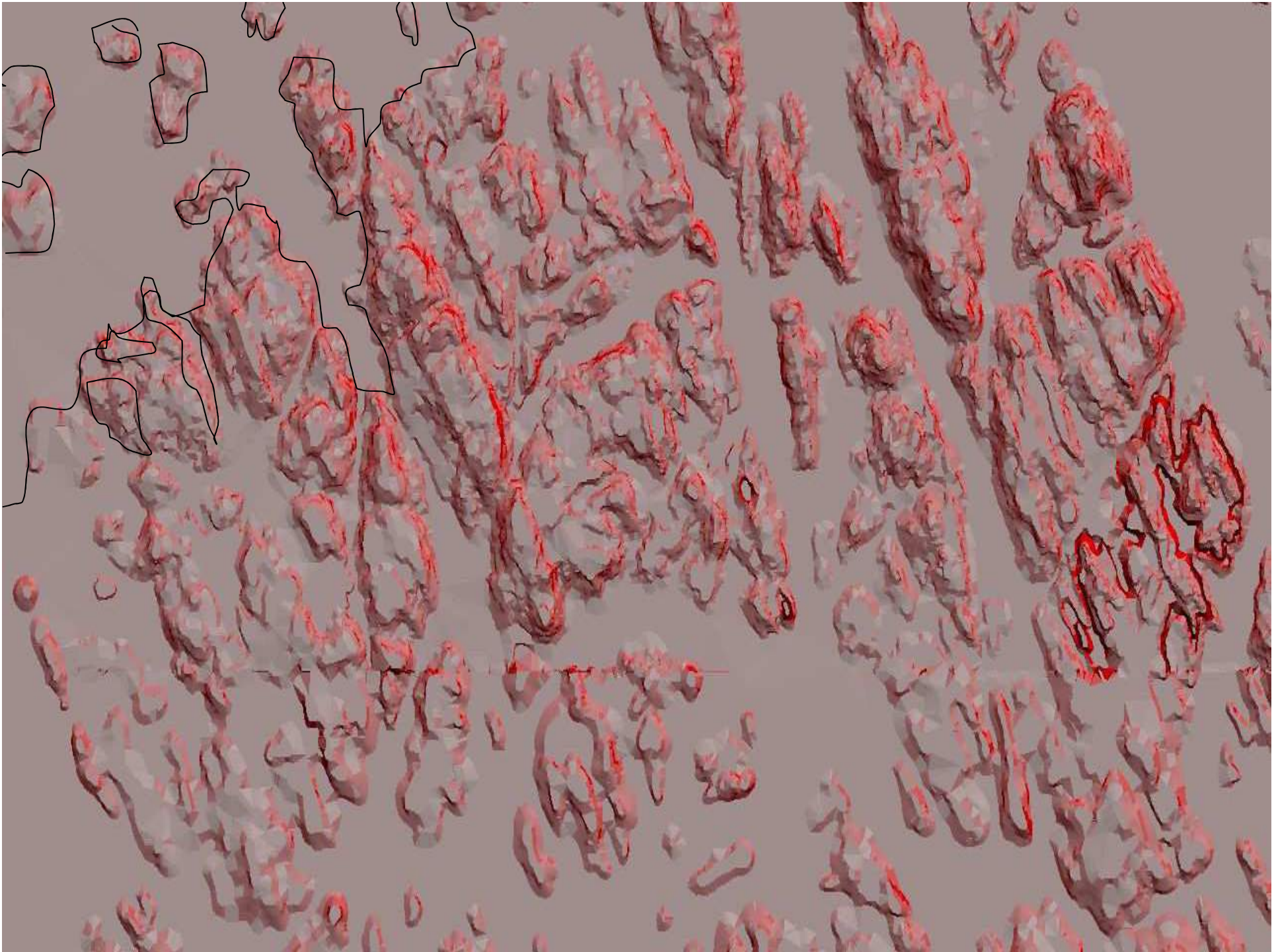


## How can we demarcate the land units ?

- 1) **By using air photos** (we are not going to explain here)
- 2) **Use of GIS**
- 3) **Use of GPS**
- 4) **Use of contour maps** (manually draw the slope classes)
- 5) **By land surveying**



**Slope classes of Kalutara district drawn using GIS software.**



## 2) Suitability Ranking (Land Evaluation)

- Land Evaluation determines the specific use for a particular land.
- Example for Specific use;  
Small scale (2-5 ac) non mechanized rainfed maize cultivation with low intensive labour use.

Descriptive use such as the above called as **Land Utilization Type (LUT)**



# Land Evaluation is a matching process....

## What we are going to match???

- Match the land qualities/characteristics with the land use requirements of proposed use.
- For this we should know ...
  - Land qualities/characteristics of particular land or land unit.
  - Requirements of LUTs (crops)

If the qualities/characteristics of the land match with the crop requirements we can say particular land is suitable for proposed crop.

# Land Qualities and Characteristics

- **Land Quality**

Complex attribute which directly affect specific kind of land use; derived from land characteristics.

Examples;

- Water availability
- Erosion resistance
- Flood hazard

- **Land Characteristic**

Measurable or estimated parameter, use for land resource mapping.

Examples;

- Slope angle
- Rainfall
- Soil texture
- Salinity


# Few Land Qualities and related Land Characteristics

## Land Quality

## Land Characteristic

- 1) Moisture availability → Total rainfall in growing season
- 2) Oxygen availability → Drainage class
- 3) Erosion hazard → Slope angle  
→ Slope length
- 4) Nutrient retention → Soil pH  
→ CEC
- 5) Excess of salts → ECe value

How we show the suitability (on maps/reports)?

- We can say ....
- Land  Suitable (S)  
Not Suitable (N)

Is it sufficient?

What about the lands which are put in between?

So we need some sort of suitability ranking



<b>ORDER</b>	<b>CLASS</b>	<b>SUBCLASS</b>	<b>UNIT</b>
SUITABLE	<b>S1</b>	<b>No sub classes</b>	
	<b>S2</b>	<b>S2e S2m</b>	<b>S2m -1 S2m- 2</b>
	<b>S3</b>	<b>S3e</b>	
NOT SUITABLE	<b>N1</b>	<b>N1e</b>	
	<b>N2</b>		

S1 – Highly suitable

S2 – Moderately suitable

S3 – Marginally suitable

N1 – Currently not suitable

N2 – Permanently not suitable

## Classroom exercise

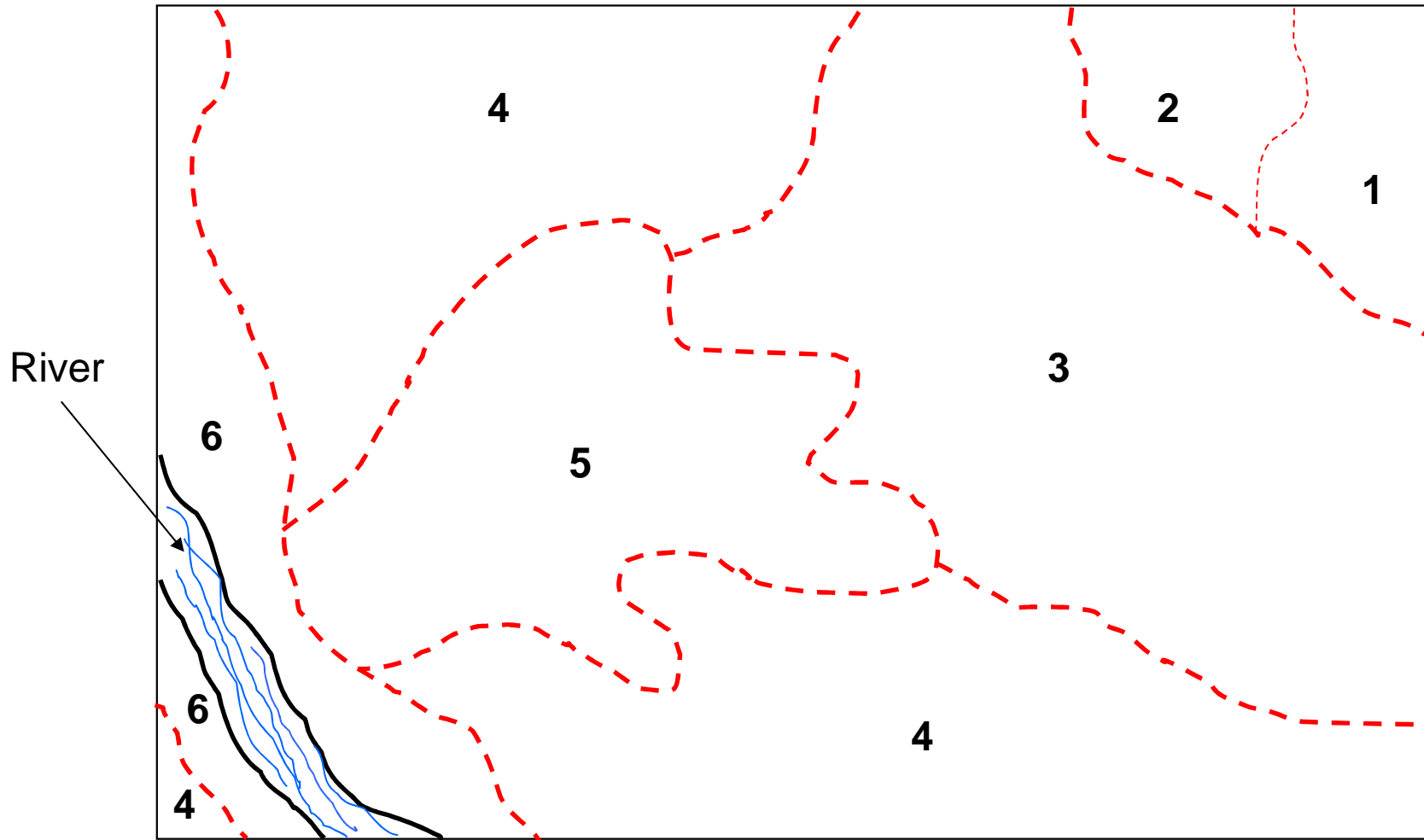
- Location: Paranagama
- Climatological Data
  - Agro-Ecological zone = IM1
  - Mean Annual Rainfall = 2255 mm
  - 75% expectancy of annual RF = 1400 mm
  - Mean annual Temperature = 24<sup>0</sup>C
  - Length of growing period = 220 days

### Land Form

- a) A mountainous area consisting of high mountain slope.
- b) Ridge and vally of medium amplitude

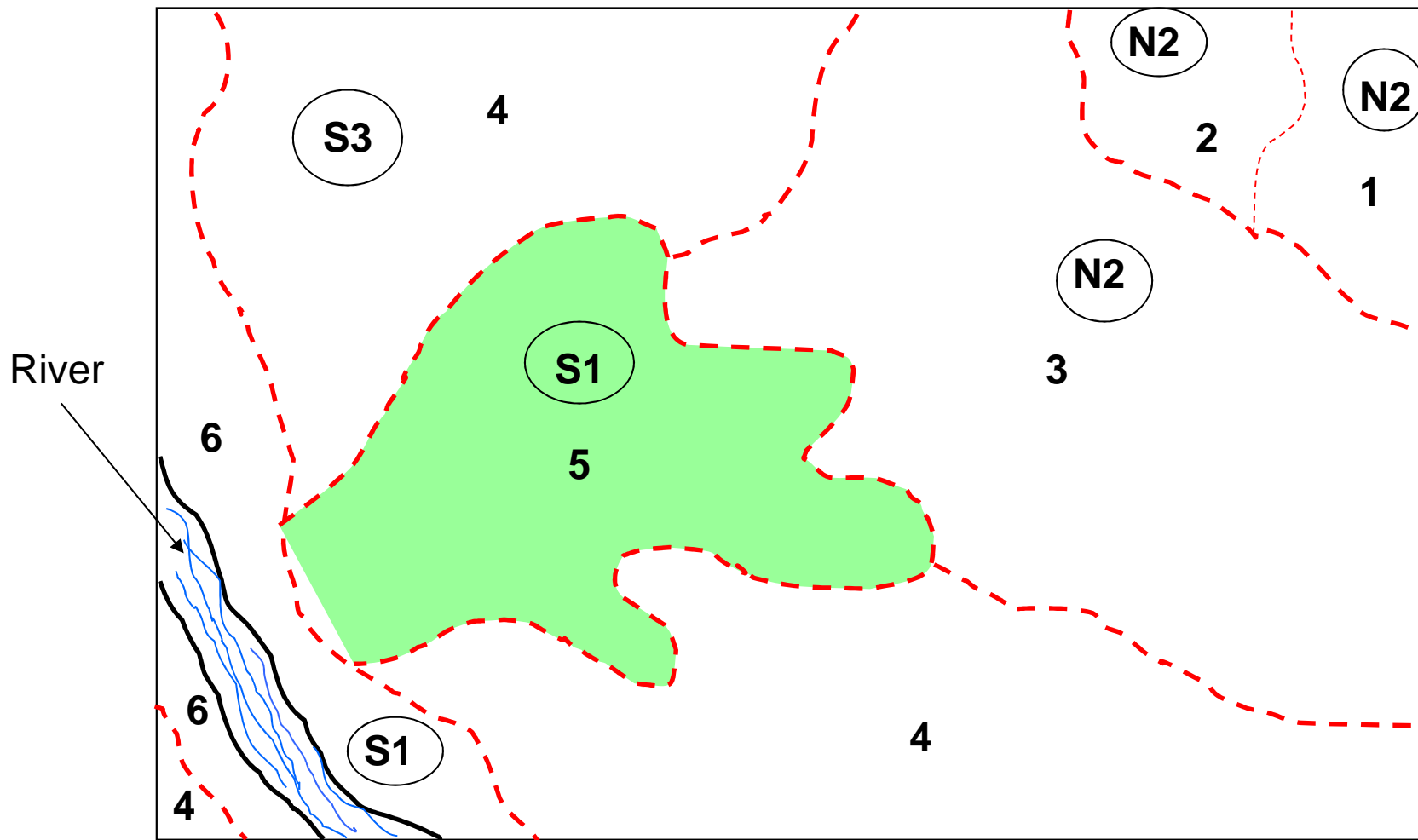
### Present Land Use

Under utilized scrub jungle



## Description of the land classification unit

LAND UNIT PHYSIOGRAPHY	SLOPE %	SOIL DEPTH	TEXTURE	DRAINAGE	ROCKINESS	PH	FLOODING
1. ESCARPMENT	>70	<50CM	SL SCL	EWD	>30%	5.5	NO
2. MOUNTAIN RIDGE	60-70	50-120	L SCL	EWD	10-20	5.5	NO
3. ROLLING TO HILLY	20-25	>120	SCL	WD	NIL	5.5	NO
4. UNDULATING	5-8	>120	SCL	WD/ MWD	NIL	5.5	NO
5. VALLEY BOTTOM	0-2	>120	CL	PD	NIL	6.3	ONCE A YEAR
6. LEVEES	0-2	>120	SCL	ID	NIL	6.5	ONCE A YEAR



**Suitability classification for paddy**

Diagnostic features for land suitability classification for Coconut(Somasiri et al. 1994)

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Table 6. Diagnostic Features for Land Suitability Classification for Coconut

Suitability Class	Agro-Ecological Region	Terrain Class and Physiographic Position	Soil/Land Characteristics	Potential Yield (Nuts/ha/yr)
S1: highly suitable	IL1 & WL3	Nearly level or gently undulating coastal plain.	Very deep, loamy sand to sandy loam, well drained to imperfectly drained soils.	More than 15,000.
S2: suitable to highly suitable	DL3, IL3, IL1, WL3 & WL4	Nearly level or gently undulating coastal plain.	Deep to very deep, sandy, imperfectly drained soils.	12,500 -15,000
	DL3, IL3, IL1 & WL3	Gently undulating alluvial plain levees.	Deep to very deep, sandy to loamy, moderately well drained to imperfectly drained soils.	
	IL1, IM3, WL3 & WL4	Undulating to rolling terrain in the mantled plain.	Deep to very deep sandy to loamy, well drained to imperfectly drained soils.	
S3: suitable	DL3, DL1 & IL3	Nearly level or gently undulating coastal plain.	Very deep, sandy or sandy to loamy, well drained soils.	10,000 - 12,500
	IL3	Gently undulating mantled plain.	Moderately deep to deep, sandy loam to sandy clay loam soils.	

Table 8. The extent of each land class in the total survey area in ha.

Classification	District					Total
	Puttalam	Kurunegala	Gampaha	Matale	Kegalle	
S1	6962	1068	3918	0	0	11948
S2	48036	101366	19525	28171	4776	201874
S3	17129	57895	21662	0	13033	109719
S4	30437	74684	46789	11042	3125	166077
S5	2024	17987	15478	21079	21678	78246
N1	42450	4776	2590	6330	0	56146
N2	194	16109	777	6994	486	24560
Others	50626	86940	34695	11559	1360	185180
Total	197858	360825	145434	85175	44458	833750



### 3) Site Assessment

- This is mainly based on non-soil factors.
- According to the location of the site the different factors can be selected.
- Numerical weight is given to each factor
- Total value will be determine the suitability of the proposed use.



**This is an example from Jo Daviess County in USA.**

**SITE ASSESSMENT FACTORS, VALUES, AND DESCRIPTIONS OF FACTORS.**

**SA-1.1. PERCENT OF LAND IN AGRICULTURE USE WITHIN ONE (1) MILE OF THE SITE BOUNDARIES**

95 to 100 percent.....	15
75 to 94.99 percent.....	12
50 to 74.99 percent.....	9
25 to 49.99 percent.....	6
10 to 24.99 percent.....	3
0 to 9.99 percent.....	0

SA-1.2. PERCENT OF LAND IN AGRICULTURE USE ADJACENT TO PERIMETER OF SITE

95 to 100 percent .....	25
75 to 94.99 percent.....	20
50 to 74.99 percent.....	15
25 to 49.99 percent.....	10
10 to 24.99 percent.....	5
0 to 9.99 percent.....	0

SA-1.3. SIZE OF PARENT PARCEL (FEASIBILITY FOR FARMING)

120 acres or more .....	15
80-119 acres .....	12
40-79 acres .....	10
20-39 acres .....	5
Under 20 acres .....	0

SA-1.5. FINANCIAL COMMITMENT TO AGRICULTURE ON ADJACENT SITES  
AS MEASURED BY EQUALIZED ASSESSED VALUATION

\$250,000 or more .....	25
\$150,000 to \$249,999 .....	20
\$100,000 to \$149,999 .....	15
\$50,000 to \$99,999 .....	10
\$25,000 to \$49,999 .....	5
\$0 to \$24,999.....	0

SA-2.1. DISTANCE FROM COMMUNITY SERVICES

Over 1.5 miles.....	15
1.5 to 1.01 miles .....	12
1.0 to .5 miles .....	10
.49 to .25 miles .....	5
.24 miles or less.....	0

Fire District Rating of requested site:

9-or above rating .....	15
8 rating .....	12
7 rating .....	10
6 rating .....	5
1-5 rating.....	0

SA-2.3. TRANSPORTATION ACCESSIBILITY

Private road .....	15
Unimproved township road.....	12
Improved township road .....	10
County highway.....	8
State highway.....	5
4-Lane highway (within 1 mile of interchange).....	3
Full range: bus, rail, highway .....	0

SA-2.6. AVAILABILITY OF PUBLIC WATER

None within 1.5 miles .....	10
Water line within 1.5 miles.....	8
Water line within 0.5 miles.....	6
Water line within 0.25 miles.....	4
Water line on site .....	0

SA-2.7. CONSISTENCY OF PROPOSED USE WITH THE COUNTY  
COMPREHENSIVE PLAN.

Inconsistent with plan .....	10
Consistent with plan.....	0

Summary Sheet  
Jo Daviess County's Point System for Assessing Farmland Conversion

Jo Daviess County, Illinois <u>Site Assessment Factors</u>	<u>Max Points Per Factor</u>	<u>Total</u>
<b>SA-1 FACTORS: Related to agricultural productivity or farm practices</b>		
1.1. Percent of land in agriculture (within 1 mile)	15	_____
1.2. Percent of agricultural land adjacent to perimeter of site	25	_____
1.3. Size of parent parcel (feasibility for farming)	15	_____
1.4. Average slope of site	10	_____
1.5. Commitment to agriculture adjacent to site	25	_____
<b>SA-2 FACTORS: Related to Development pressure, land conversion, or other public values</b>		
2.1. Distance from community services	15	_____
2.2. Fire District Rating Class	15	_____
2.3. Transportation accessibility	15	_____
2.4. Availability of central sewer	10	_____
2.5. Soil suitability for on-site disposal	25	_____
2.6. Availability of public water	10	_____
2.7 Consistency with County Comp. Plan (20 Points if no Municipal plan)	10	_____
2.8 Consistency with Municipal Comp. Plan	10	_____
Total Points – Site Assessment	<b>200</b>	=====
Total Points – Land Evaluation	<b>100</b>	=====
 <b>GRAND TOTAL</b>	 <b>300</b>	 _____



**Annex I**

The following criteria (8) were used for the assessment. Numerical values were given for each and every criterion based on the field observations. Every main criterion was given the value of 25 which was divided into sub factors. The magnitude of the value varies with the sub factor. All figures were added to get a total figure. If all the criteria get the maximum value (25) the total will be 200 (25x8). If the total figure is more than 100 the site was considered as suitable for the proposed use. If it is less than 100 then the site was considered as not suitable.

**Criteria and sub criteria**

**value**

**Value    Given**

**1) Existing land use in the site**

Housing.....	0	
Agriculture.....	5	
Forest.....	10	
Bare land.....	25	25

**2) Adjoining land uses. Percentage of lands used for agriculture**

100% lands used for agriculture	0	
75% lands used for agriculture	5	
50% lands used for agriculture	10	
25% lands used for agriculture	15	
Less than 24%	25	25

3) Availability of drinking water in the area at present

Pipe bone water available.....	0	
% of wells available within a 3 km radius		
100% .....	5	
75%.....	10	
25% or less.....	25	25

4) % of drying out of wells during the dry spell

100%.....	25	
75%.....	15	
50%.....	10	10
25% or less.....	5	

5) Quality of the well water at present

Very good.....	15	15
Good.....	10	
Moderate.....	5	
Poor.....	0	

6) Suitability of the site for agriculture

Highly suitable for agriculture	0	
Marginally suitable for agriculture	10	10
Not suitable for agriculture	25	

7) Suitability of the site for housing

Highly suitable for housing	0	
Marginally suitable for housing	10	10
Not suitable for housing	25	

8) Availability of infrastructure for the proposed use

Necessary infrastructure are available at the site	25	25
Moderately available	15	
Availability is low	5	








Total..... 145

Annex I: Matrix of Suitability Ranking for Tourism

Criteria Used		Maximum weight given through Matrix	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6
1.	Quality of land/Beauty of the View	10	10	10	10	10	10	10
2.	Accessibility (Roadway)	10	10	10	10	10	10	10
3.	Cost/Value for Money	10	10	10	10	10	10	10
4.	Security/Political Risk	10	10	10	10	10	10	10
5.	Availability of Accommodation/Facilities	10	10	10	10	10	10	10
6.	Weather/Climate	10	10	10	10	10	10	10
7.	Facilities/Infrastructure/Support	Low Medium High	10	10	10	10	10	10
Total			70	70	70	70	70	70
Suitability Rank:			Highly Suitable	Suitable	Moderately Suitable	Marginal	Not Suitable	Very Unsuitable

Source: Author's compilation based on literature on Tourism.

## Graphical presentation of suitability for grazing in Zimbabwe

physiographic unit	map unit	land suitability classification for extensive grazing				remarks
		S1	S2	S3	N	
mountains (volcanic)	MV1					too cold
uplands (volcanic)	UV1/2					too cold
sedimentary plains	PsU1/2					
stepped plateaux 1	LsV1P					
stepped plateaux 2	LsV2					





## LAND EVALUATION EXCERSISE

**1. Location:** Paranagama

**2. Climatologically Data;**

<b>Agro-ecological zone:</b>	<b>IM1</b>
<b>Mean Annual Rainfall:</b>	<b>2255 mm</b>
<b>75% expectancy of annual rainfall:</b>	<b>1400 mm</b>
<b>Mean Annual Temperature:</b>	<b>24°C</b>
<b>Length of Growing Period:</b>	<b>220 days</b>

**Elevation: 300-900 m**

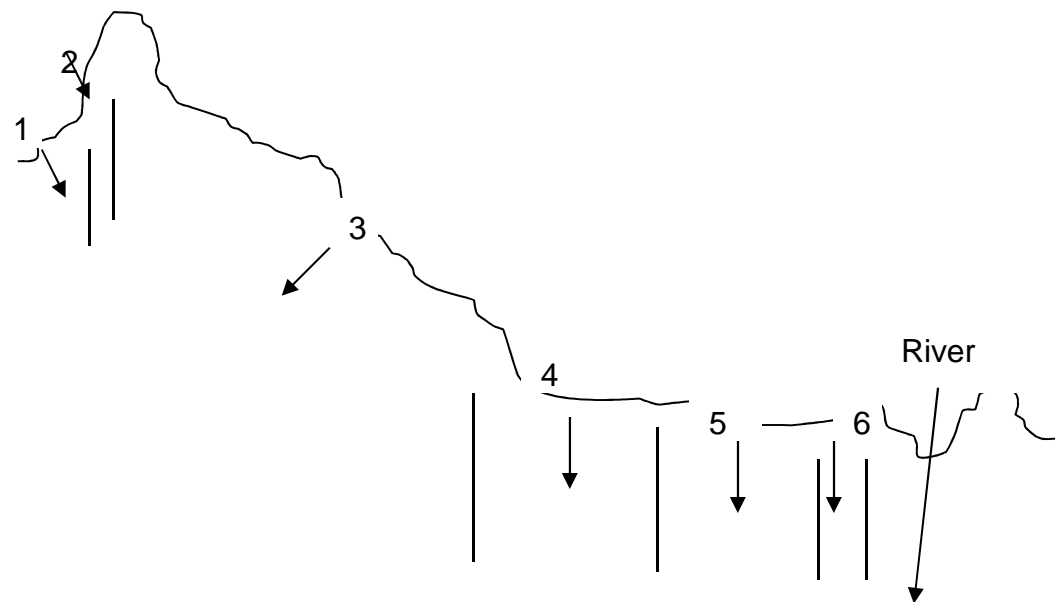
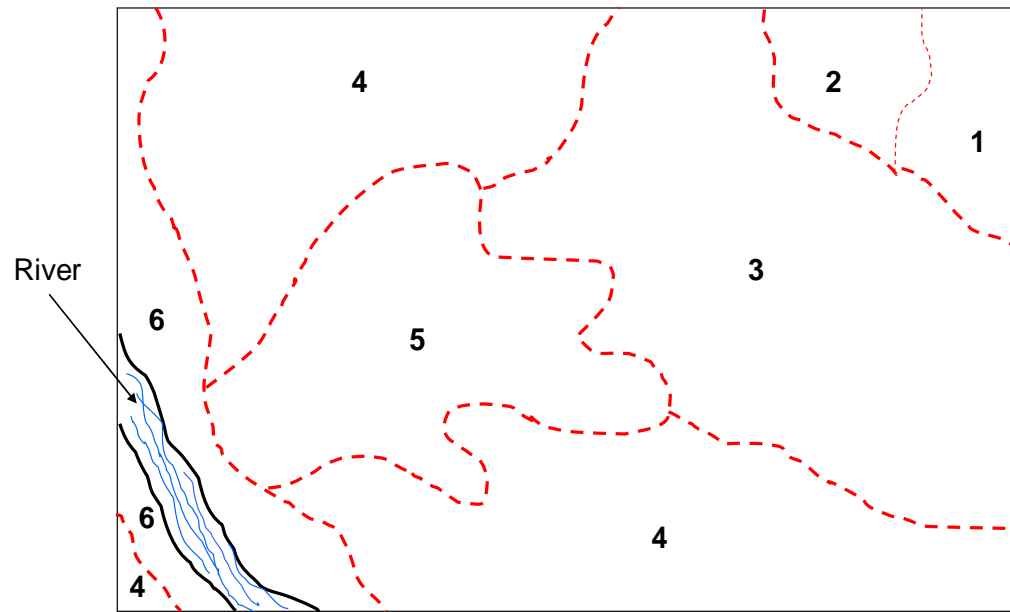
**3. Landform;**

- A mountainous area consisting of high mountain slope.
- Ridge and valley of medium amplitude.

**4. Present Land Use;**

**Under utilized scrub jungle.**





**Description of the land classification unit**

LAND UNIT PHYSIOGRAPHY	SLOPE %	SOIL DEPTH	TEXTURE	DRAINAGE	ROCKINESS	PH	FLOODING
1. ESCARPMENT	>70	<50CM	SL SCL	EWD	>30%	5.5	NO
2. MOUNTAIN RIDGE	60-70	50-120	L SCL	EWD	10-20	5.5	NO
3. ROLLING TO HILLY	20-25	>120	SCL	WD	NIL	5.5	NO
4. UNDULATING	5-8	>120	SCL	WD/ MWD	NIL	5.5	NO
5. VALLEY BOTTOM	0-2	>120	CL	PD	NIL	6.3	ONCE A YEAR
6. LEVEES	0-2	>120	SCL	ID	NIL	6.5	ONCE A YEAR

**Complete the following table using given data and determine the suitability of land units for given land uses.**

**Note: You also can develop different methods to match the land characteristics/qualities with crop needs. Think about it.....**



Land Quality	Land Characteristics	Land use requirements for Rubber				Land Units											
		S1	S2	S3	N	1	2	3	4	5	6						
1. Moisture availability	75% prob. rainfall (mm)	>2300	1900-2300	1400-1900	<1400	1400	S3	1400	S3	1400		1400		1400	S3	1400	
	Soil depth (cm)	>150	100-150	75-100	<75	<50	N	50-120	S2	>120		>120		>120		>120	
	Texture*					SL, SCL		L, SCL		SCL		SCL		SCL		S, LS	
	Drainage	WD	WD	MW, EWD	ID, PD	WD		WD	S1	WD		WD		PD		ID	
2. Oxygen availability in the root zone	Drainage class of soil	WD	WD	MW, EWD	ID, PD	WD		WD	S1	WD		WD		PD		ID	
3. Nutrient availability for crop growth	Soil depth	>150	100-150	75-100	<75	<50		50-120	S2	>120		>120		>120		>120	
	CEC																
	pH	5-6	4.5/6-6.5	4-4.5 6.5-7	<4->7	5.5		5.5	S1	5.5		5.5		6.5		6.5	
4. Condition for crop ripening and harvesting	Length of growing period	>330	300-330	270-300	<270	220		220		220		220		220		220	
	Mean annual Temperature	25-28	23-25	21-23	<21	24		24	S2	24		24		24		24	
5. Availability of land space for optimum planting density	% of rockiness of the soil surface	none	1-10	10-20	>20	>30		10-20	S3	no		no		no		no	
6. Flooding hazard	Frequency of flooding					No		no		no		no		1/yr		1/yr	
7. Erosion hazard	Slope percentage	0-16	17-30	30-60	>60	>70		60-70		20-25		5-9		0-2		0-2	
8. Soil workability	Top soil texture																
	% of rockiness	none	1-10	10-20	>20	>30		10-20	S3	no		no		no		no	
Overall suitability																	