

Visual Image Interpretation

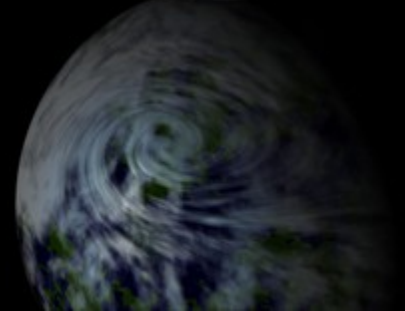
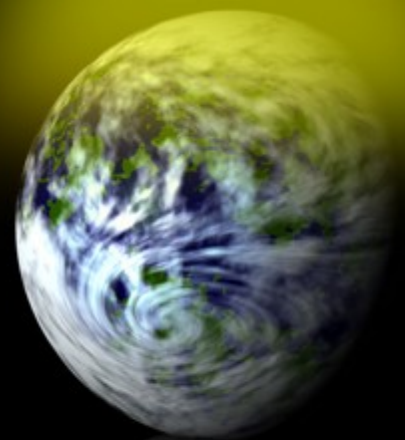


Neeraj Pandey TA GIS



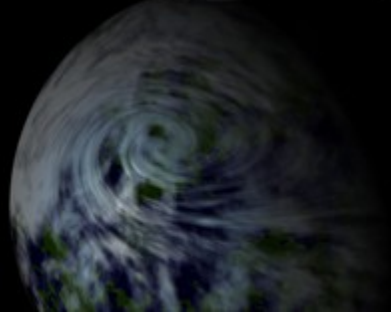
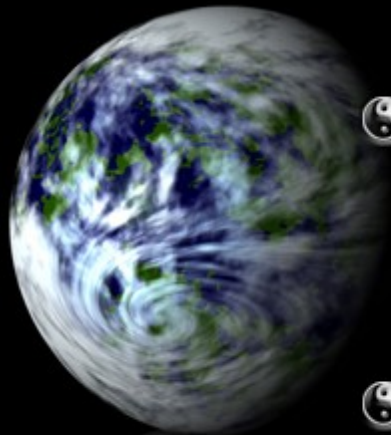
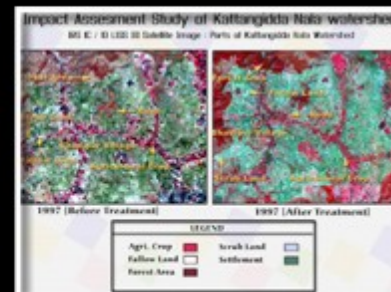
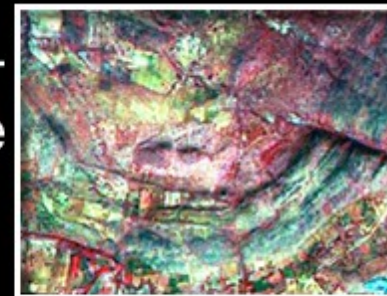
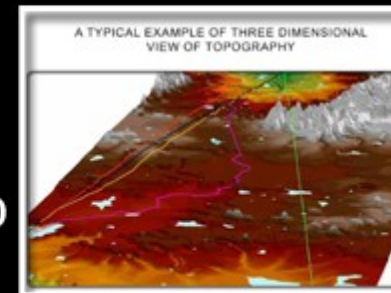
INTRODUCTION

- ★ V.I is defined as the art and science of examining the images for the purpose of identifying objects and judging their significance.
- ★ Interpreters study remotely sensed data and attempt through logical process to detect, identify, measure and evaluate the significance of environmental and cultured objects, patterns and spatial relationship.



BASIC REASONS

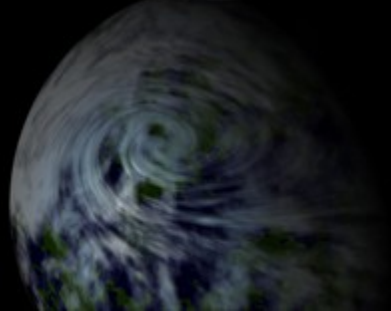
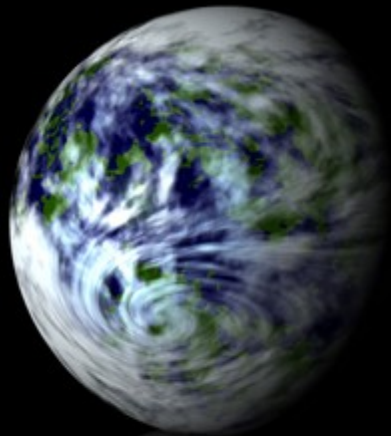
- ② Large area of the earth and surface form a perspective view
- ② Provide 3 D view.
- ② Characteristics of objects not visible to the human eye can be transferred.
- ② It provides the observer with a permanent record / representation of objective at any instant of time.
- ② Temporal studies.



INTERPRETATION ELEMENTS

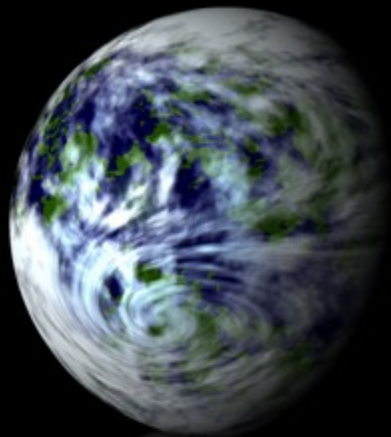
★ The interpretation elements are

- Size
- Shape
- Shadow
- Tone / Colour
- Texture
- Pattern
- Site
- Association



TONE / COLOUR

- ☯ Tone is each distinguishable variation from white to black
- ☯ Colour due to variation in hue, intensity and saturation
- ☯ Human eye can differentiate 20 to 30 shades of grey tones and more than a million colour



Tone



Beach sand

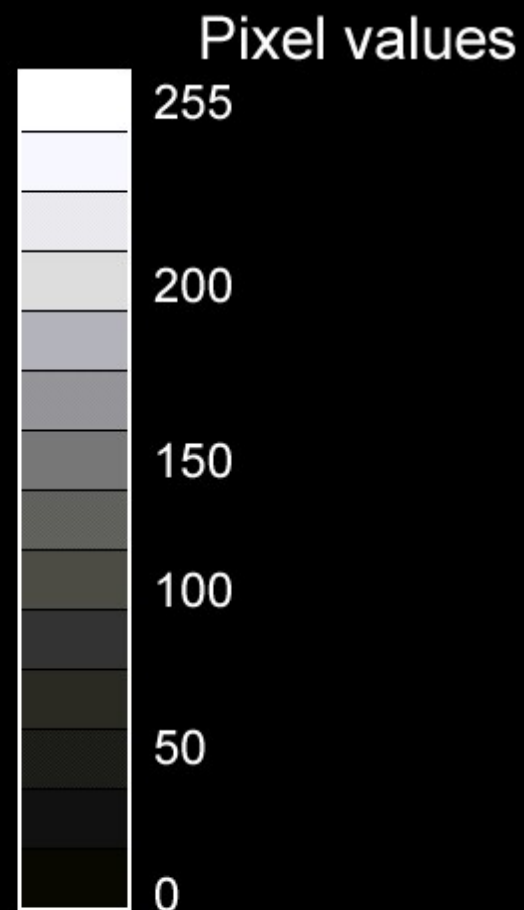
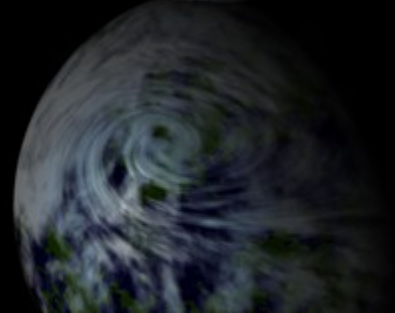
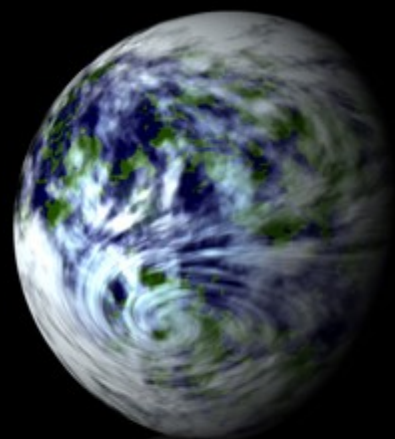


Colour



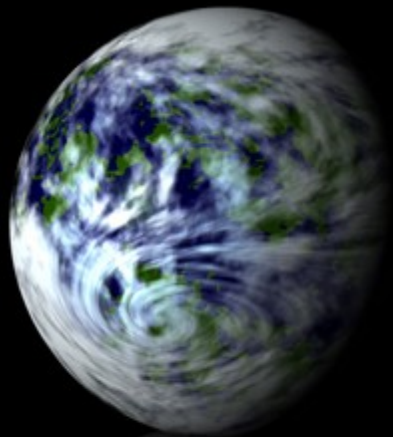
Levels of Grey values

Satellite images are transmitted in digital form to the ground station
e.g. each picture element (pixel) is expressed in 256 grey levels



TEXTURE

- ☯ Arrangement and frequency of tonal variation (visual smoothness or coarseness)
- ☯ Coarse textures - abrupt tonal variation
- ☯ Smooth textures - very little tonal variation
- ☯ Most important for radar imagery interp.



Coarse - forest



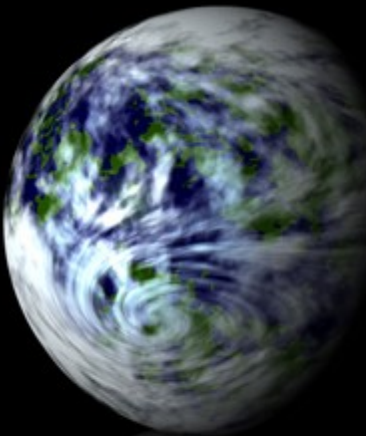
Fine - water



River and Forest

SHAPES

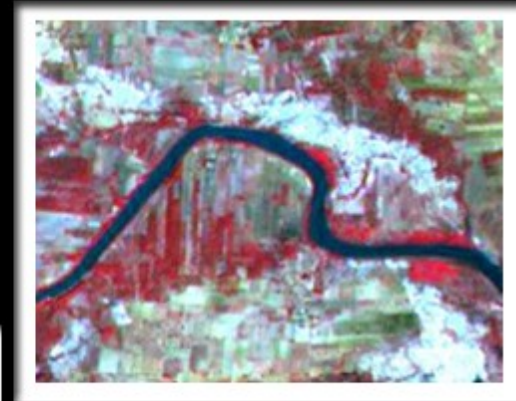
It refers to the outline of an object. Numerous components of the environment can be identified with reasonable certainty merely by their shape or forms. This is true with both natural (geological) and man made objects (industry).



Stadium



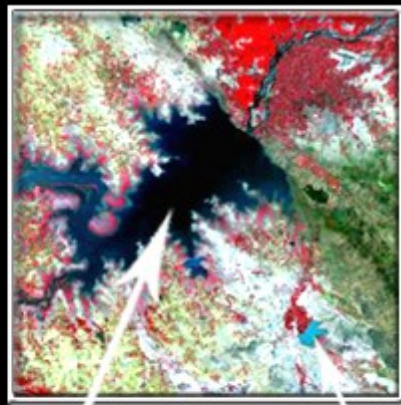
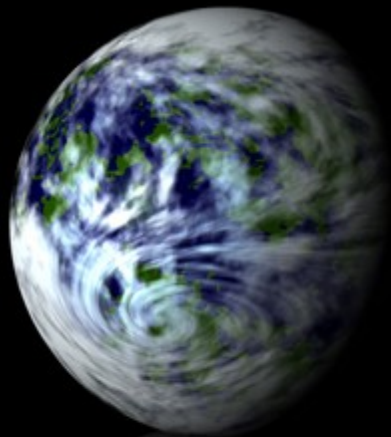
Buildings



River

SIZE

- ☯ Size is a function of scale.
- ☯ Relative to other objects and absolute size
- ☯ Relative scale (small, medium, large)
- ☯ Absolute scale (size clues)



Reservoir - tank



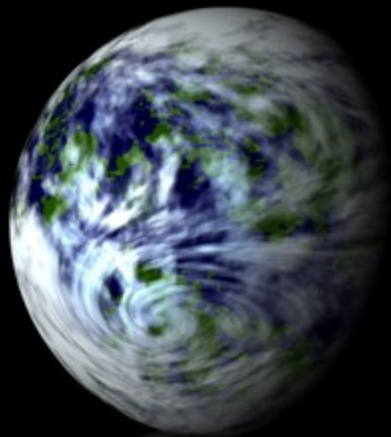
City



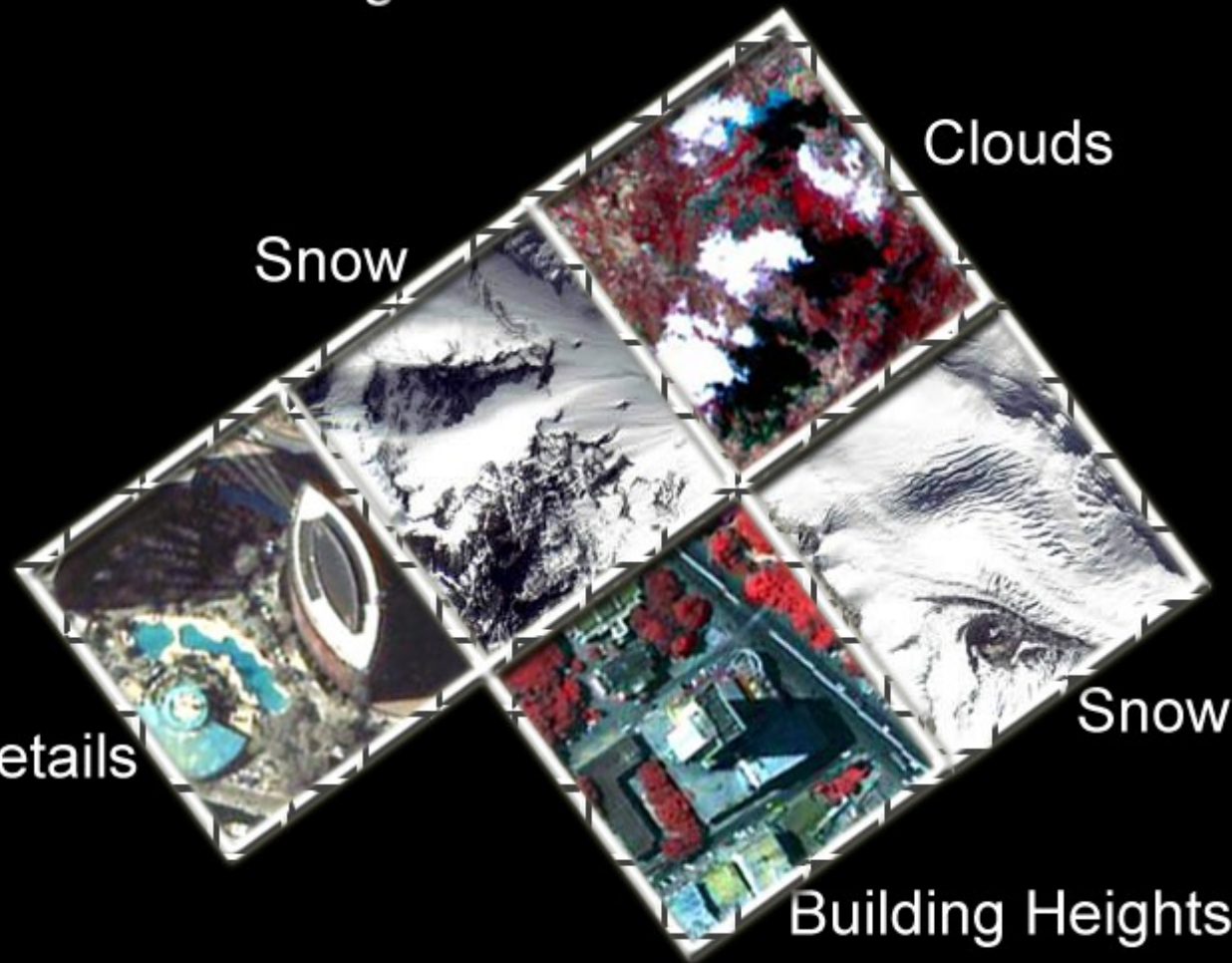
Village

SHADOW

- ☯ At times quite informative.
- ☯ To distinguish snow and cloud unfortunately deep shadow observe significant features.



Obscure Details



Snow

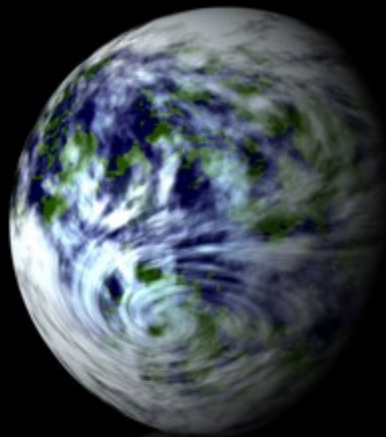
Clouds

Snow

Building Heights

PATTERN

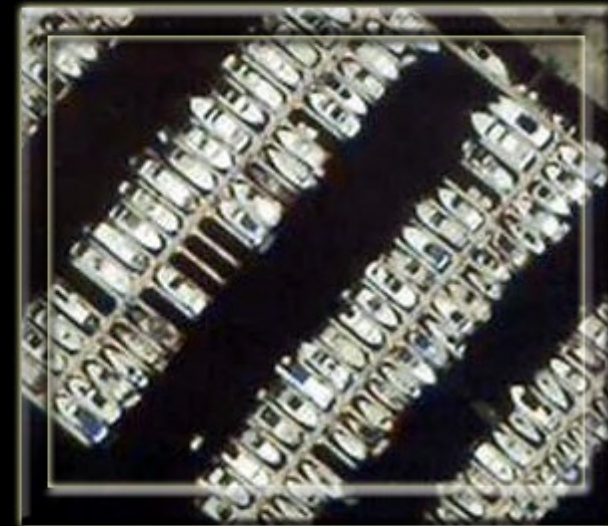
- ✓ Spatial arrangement of visibly discernible objects
- ✓ An orderly repetition of similar tones and textures will produce a distinctive and recognizable pattern.
- ✓ Orchards with evenly spaced trees,



Drainage



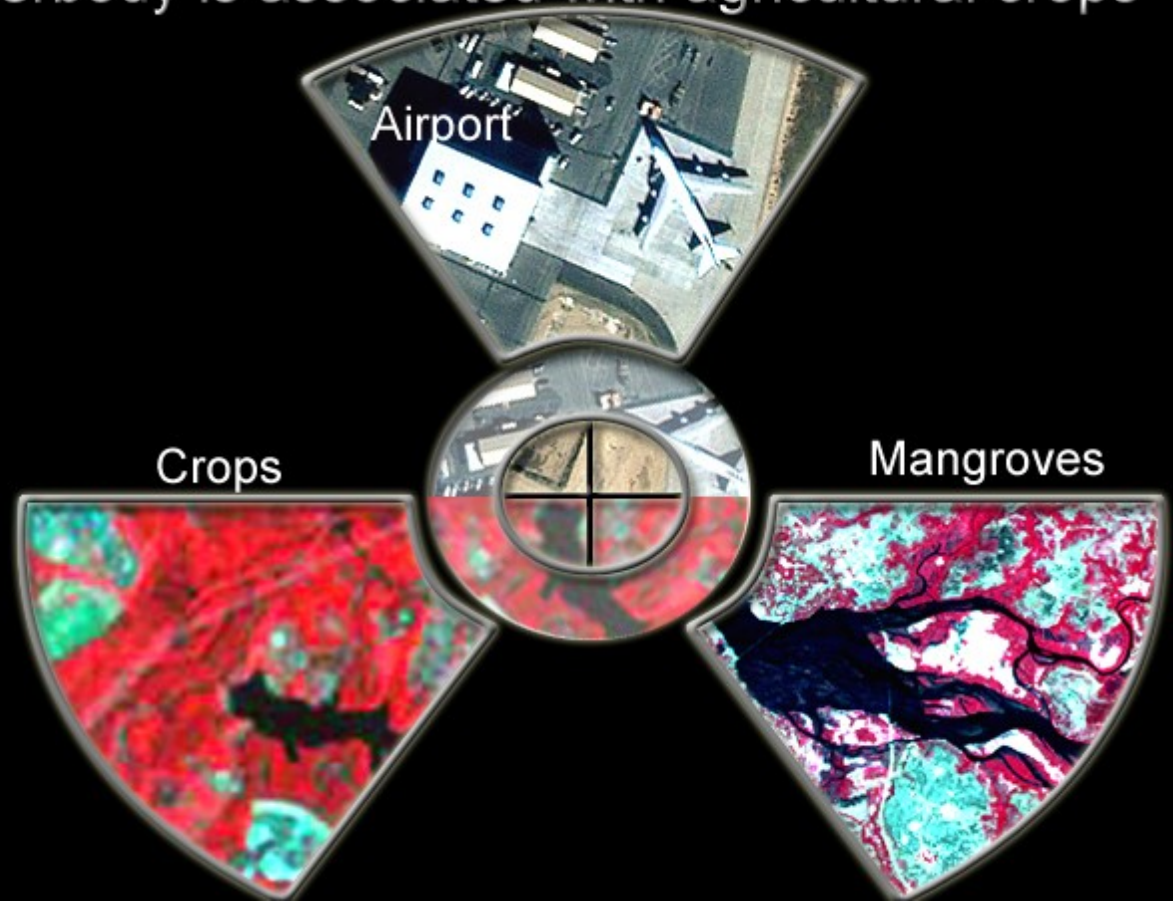
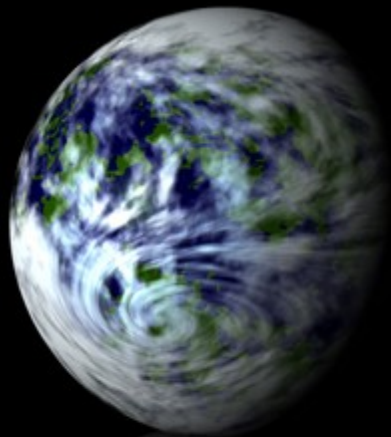
Settlements



Port

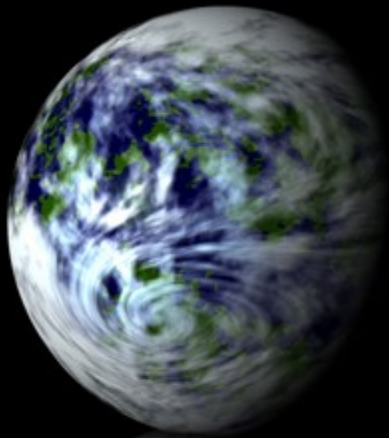
SITE OR ASSOCIATION

- ✦ features in proximity to the target of interest
Mangroves associated with waterbodies
- ✦ A waterbody is associated with agricultural crops



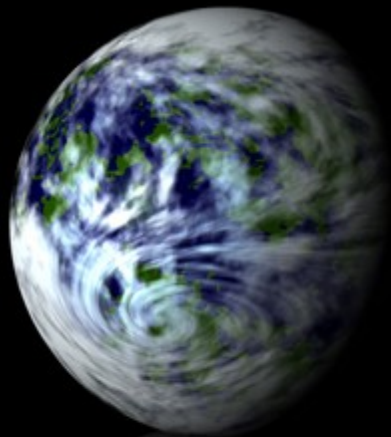
GEOTECHNICAL ELEMENTS

- ★ Features on the earth's surface such as land forms, vegetation, landuse, soil.
- ★ Study and analysis of these geotechnical elements information on lithology, structure, Ground Water etc may be derived.



DRAINAGE

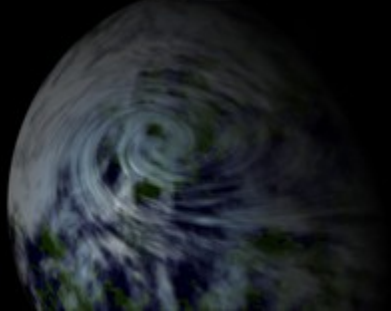
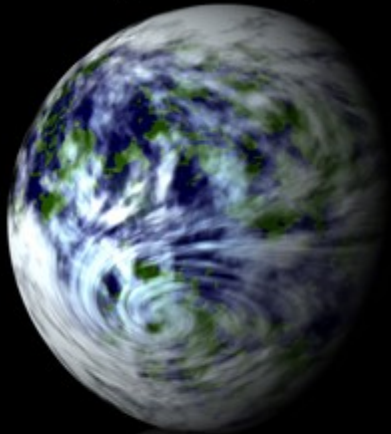
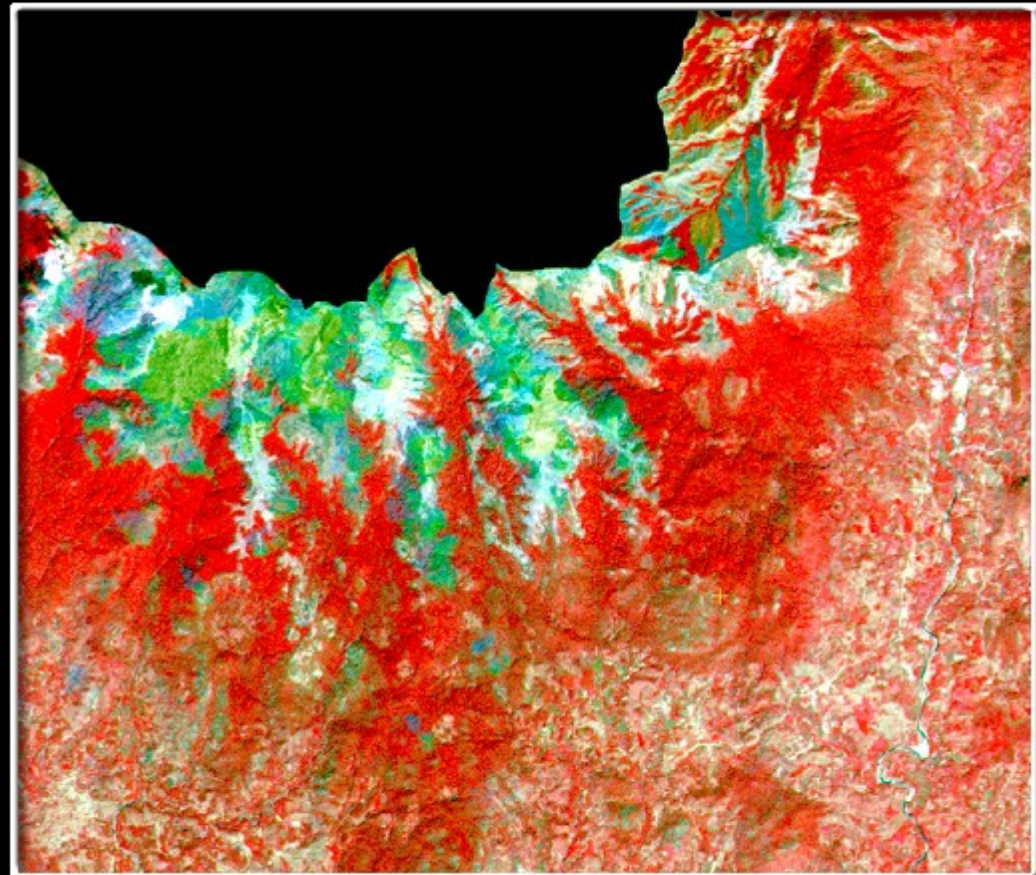
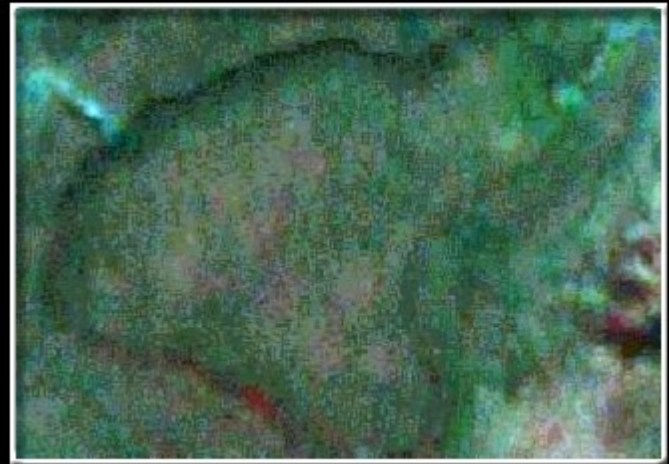
- ★ It include drainage pattern dendritic parallels
- ★ Drawing texture – coarse, fine



VEGETATION

It is controlled by

- ◇ Climate
- ◇ Altitude
- ◇ Geology
- ◇ Soil and
- ◇ Hydrological characteristics

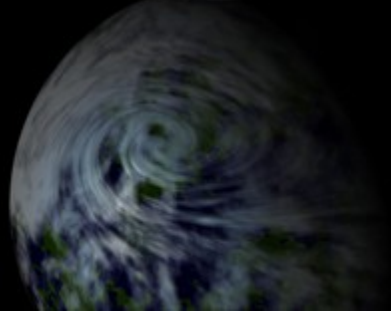
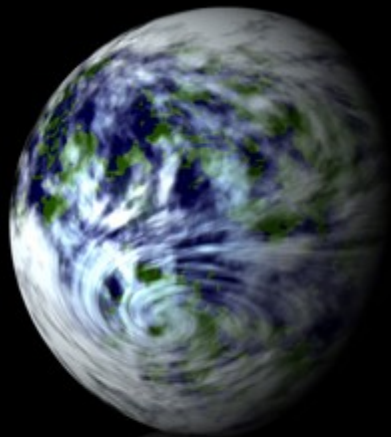
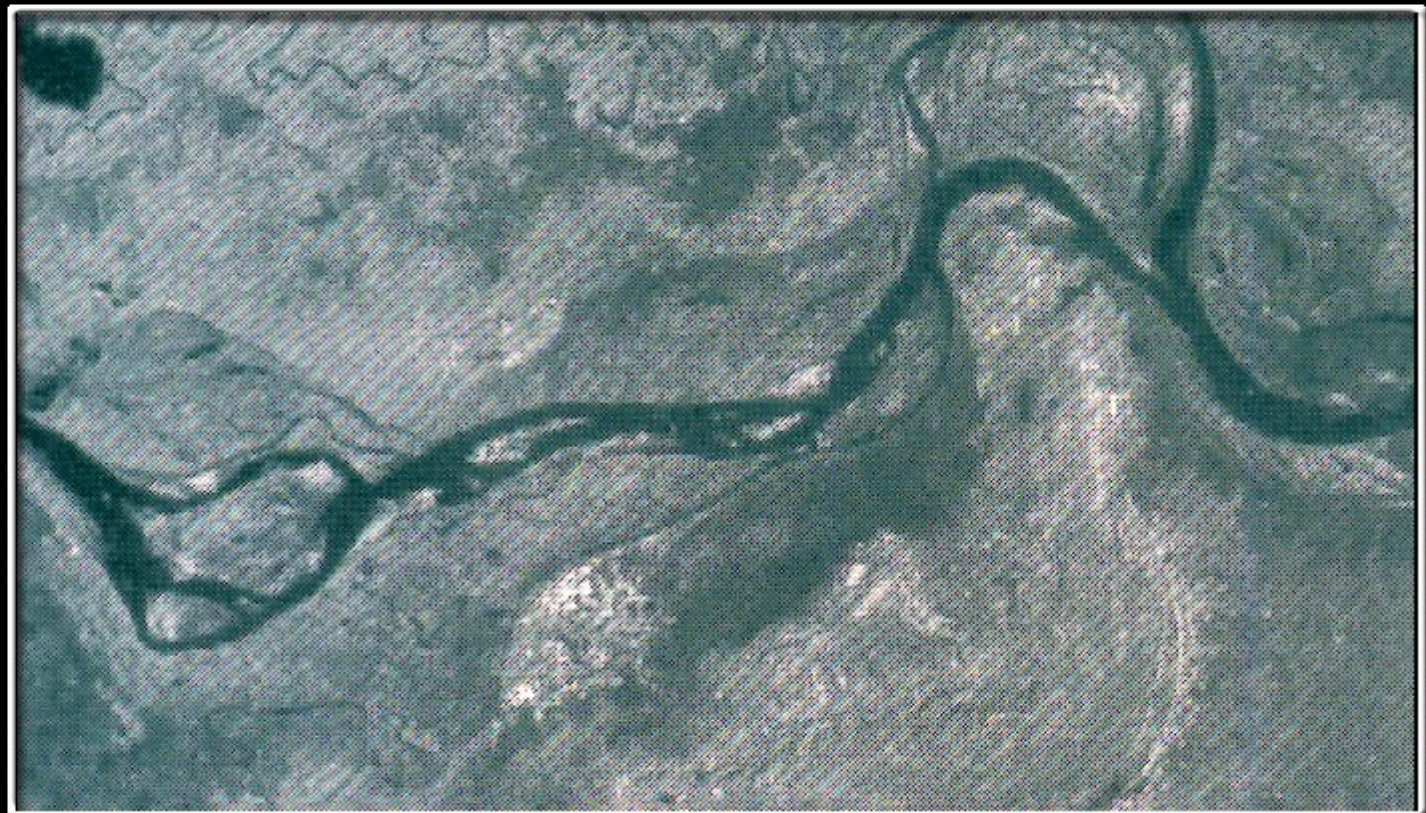


LAND FORM

Alluvial landform - Ox-bow lakes

Eolian landform - Sand dunes

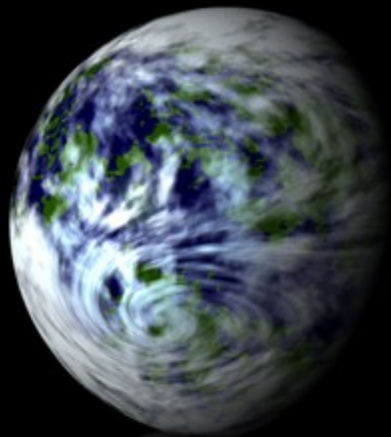
Erosional landform - Linear ridge and valley



.....Apart from these

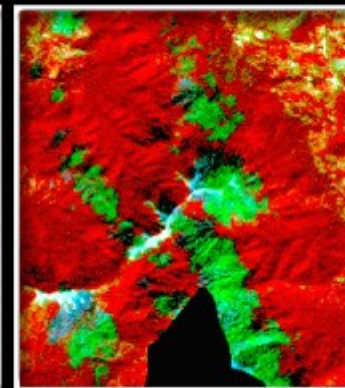
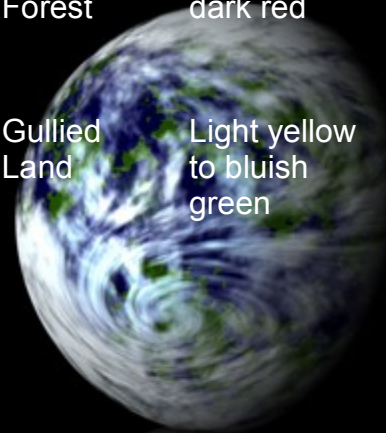
Prior Knowledge about

- ❁ Date / time of satellite data
- ❁ Season eg. Kharif / Rabi / Summer
- ❁ Weather conditions
- ❁ Characteristics of the area

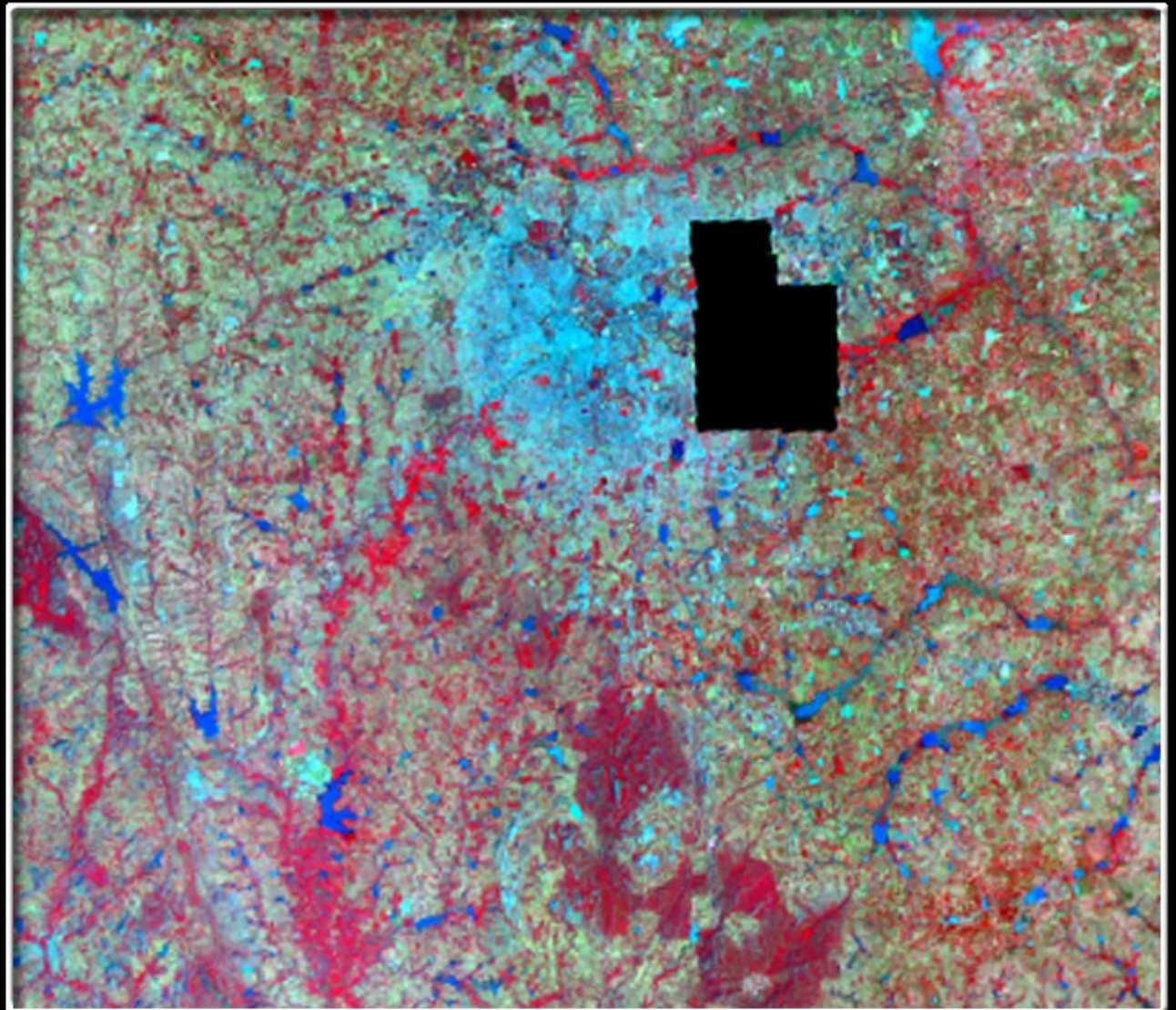
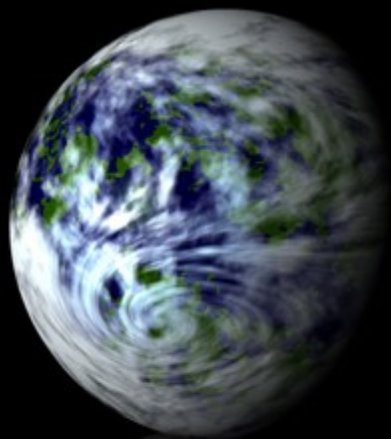


INTERPRETATION KEY

Category	Tone	Size	Shape	Texture	Pattern	Location	Association	Season
Built – up	Dark bluish green and bluish	Small to big	Irregular discontinuous	Coarse and mottled	Clustered to scattered	Plains	By agriculture lands, rivers, road and rail	Oct to March
Crop Land	Bright red to red	Varying in size	Regular to irregular	Medium to smooth	Contiguous	Plains, hills, slopes, valleys	Amidst irrigated	June – Sept Oct – Dec Feb – May
Evergreen Forest	Bright red to dark red	Varying in size	Irregular size	Smooth to medium	Contiguous to non contiguous	High relief	High relief	Jan – December Feb – May
Gullied Land	Light yellow to bluish green	Varying in size	Irregular broken	Very coarse	Dendrite to sub dendritic	Stream	Plain lands	Dec to March



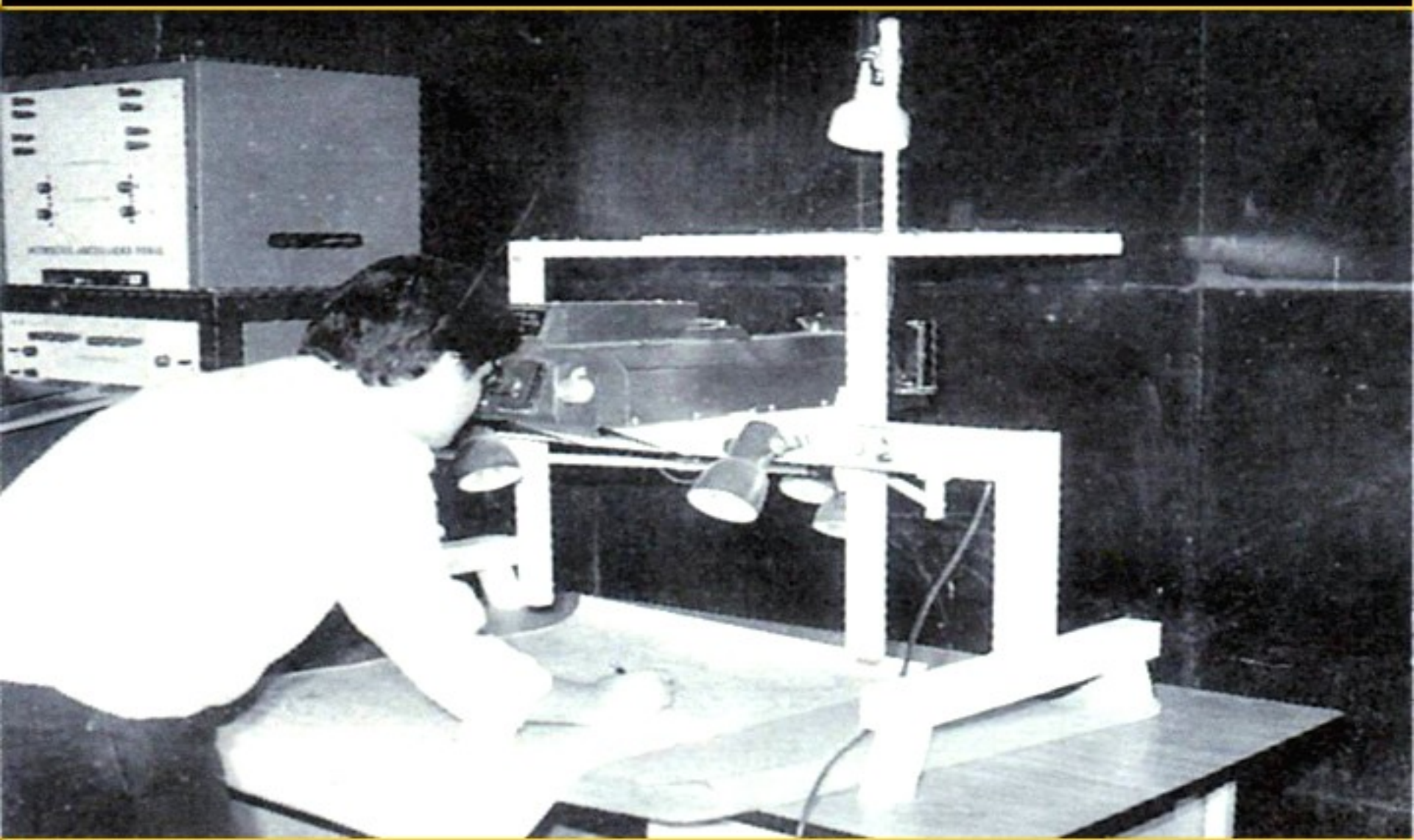
LISS III + PAN MERGED DATA



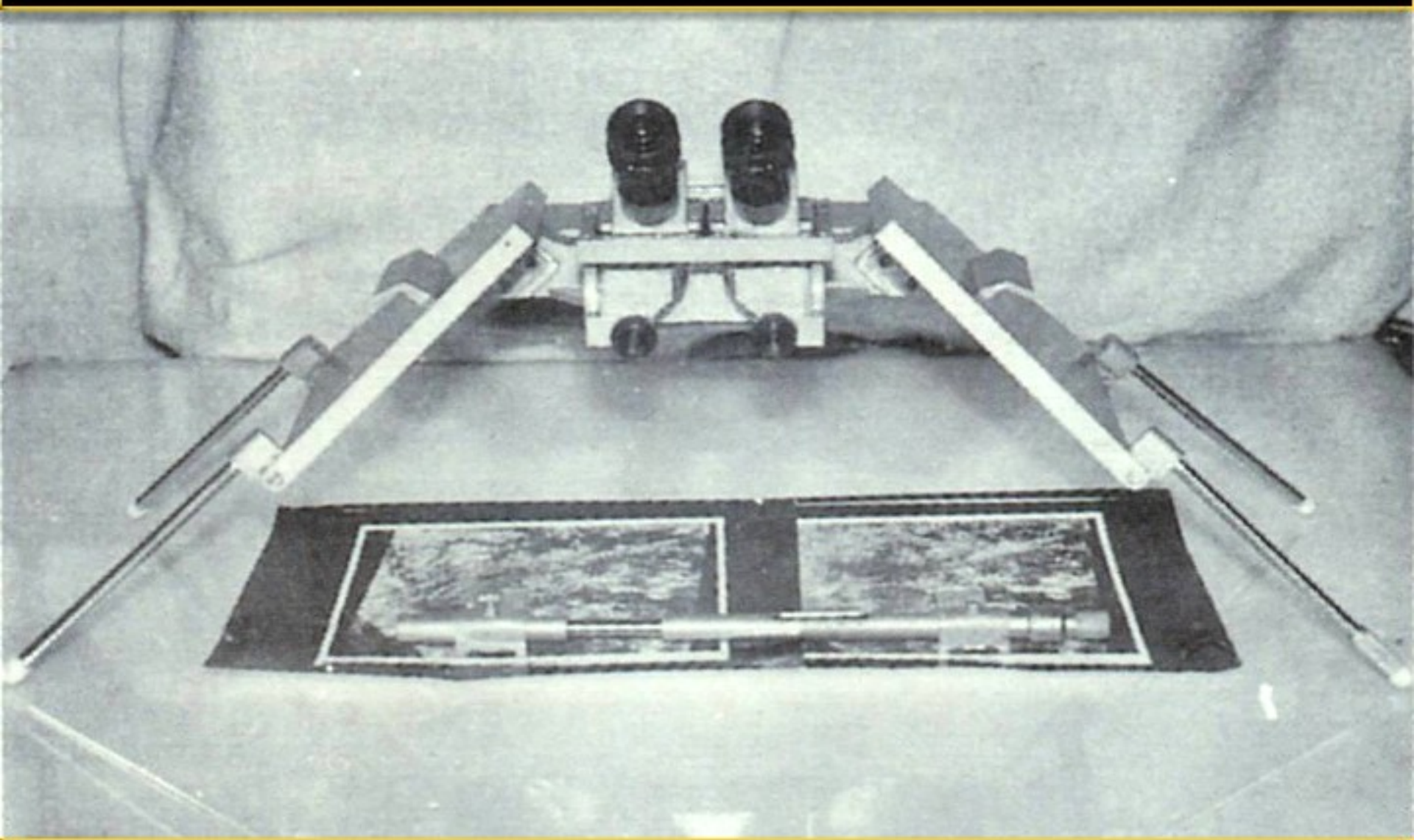
DYNASCAN



ZOOM TRANSFEROSCOPE



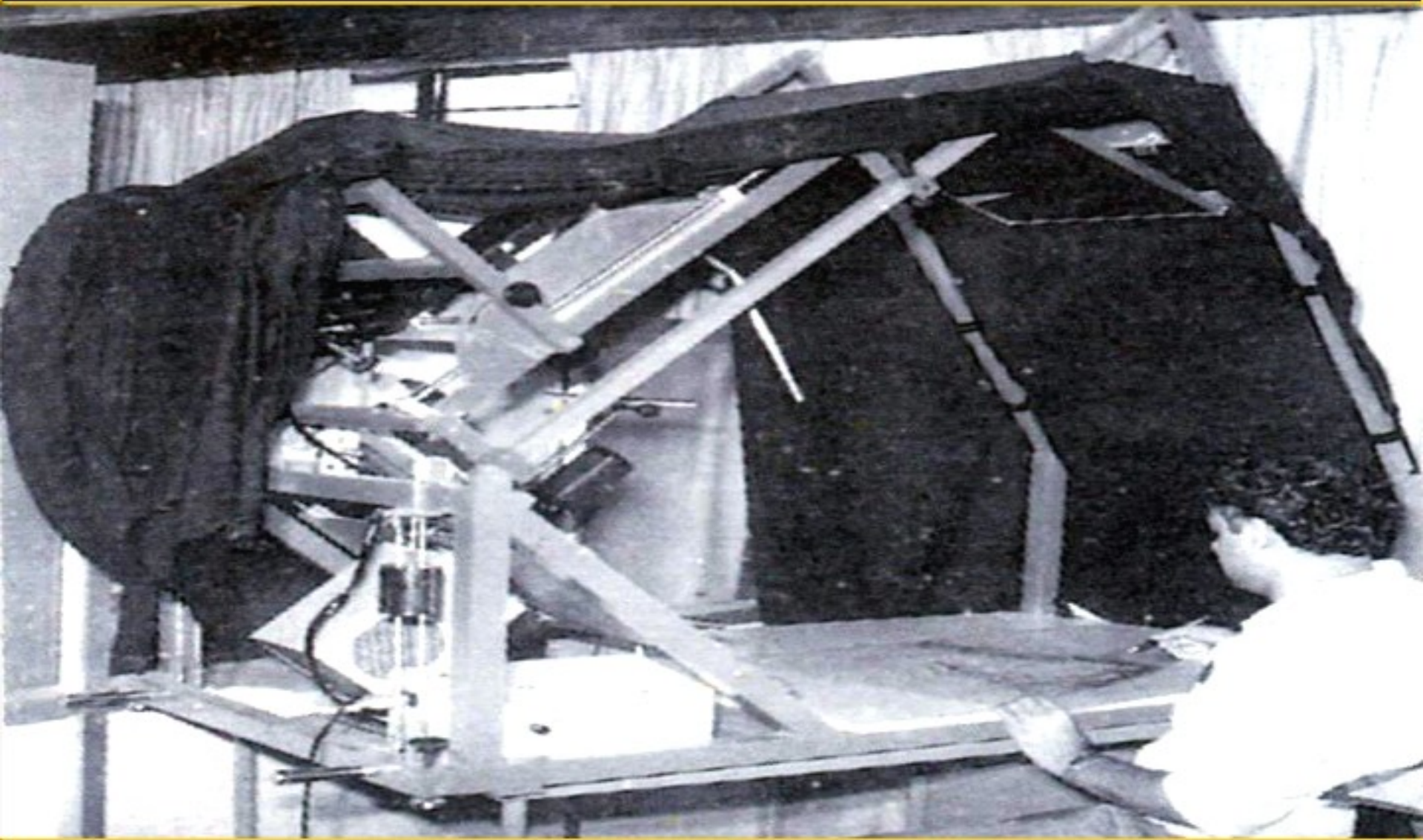
MIRROR STEREOSCOPE



MULTISPECTRAL ADDITIVE COLOR VIEWER



PROCOM



LIGHT TABLE



DIGITAL PLANIMETER



PREPARATION OF BASE MAPS

Extraction of permanent features from SOI toposheet Viz.,

- ③ Graticules with values
- ③ Road
- ③ Railway
- ③ Water bodies
- ③ Forest Boundary
- ③ Administrative Boundaries
- ③ Graticules with values
- ③ Major settlements

PREPARATION OF LAND USE / LAND COVER MAPS

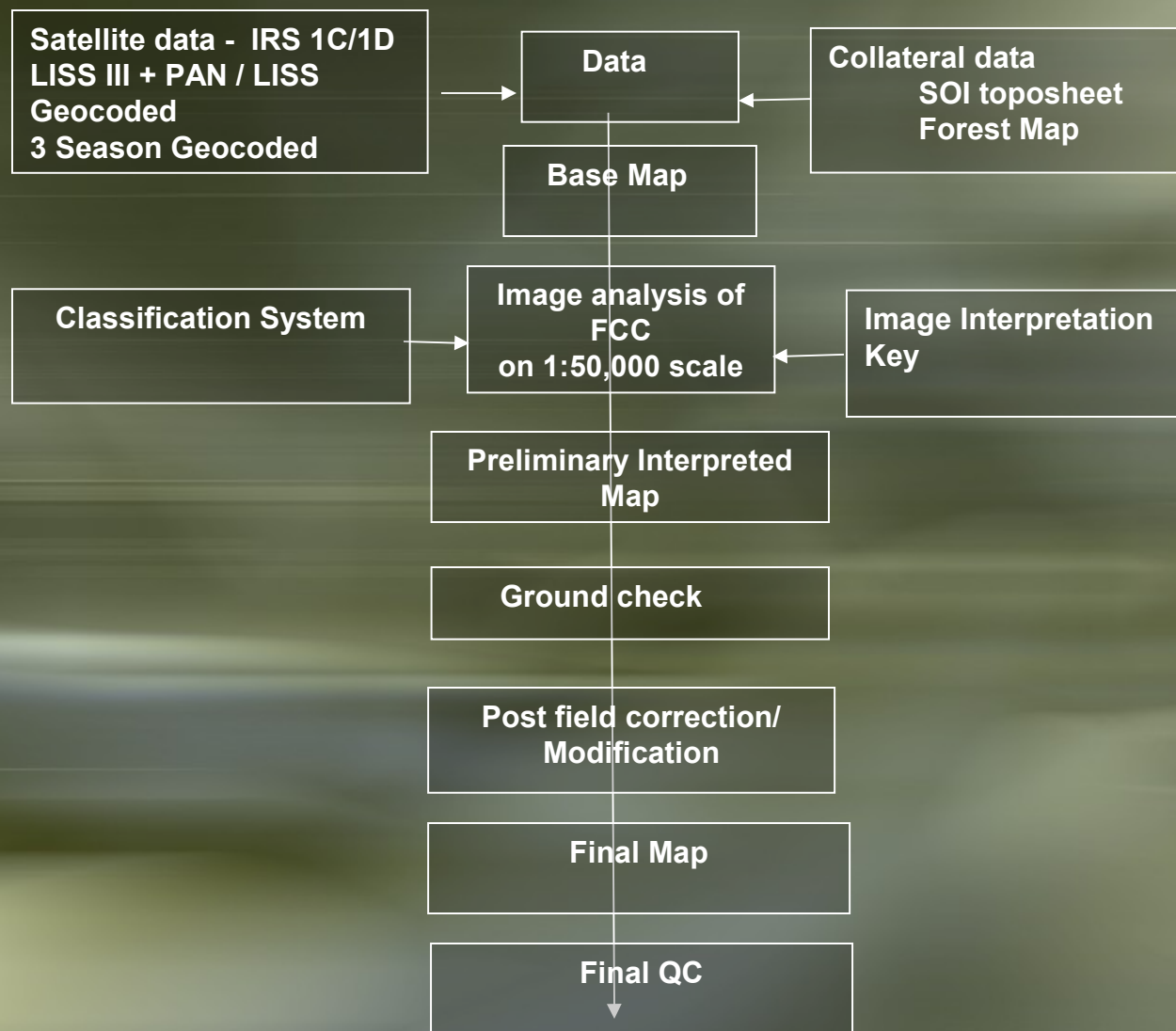
DATA PRODUCTS and SCALE of MAPPING

Landuse/ Landcover	Satellite Data Product	Scale of Mapping
I	Landsat MSS; IRS LISS I View Image	1:2,50,000 & smaller
II	Landsat TM, IRS LISS II, LISS III, SPOT MSS View Image	1:50,000 & smaller
III	SPOT PAN, IRS 1C/1D PAN View Image	1:50,000 to 1:25,000
IV	IRS 1C/1D LISS III + PAN 5.8m View Image	1:25,000 to 1:12,500
IV	IKONOS MS 4m View Image	1:10,000
IV	IKONOS PAN 1m, QuickBird 0.61m View Image	1:4000-1:3000

DATA REQUIRED

- **SOI Toposheets**
- **3 Season satellite imagery**
- **Collateral data**

FLOW CHART FOR PREPARATION OF LANDUSE\LANDCOVER MAPS



DES – LANDUSE CLASSIFICATION SYSTEM

1.Forest

2.Cropland

3.Cultivable wasteland

4.Uncultivable wasteland

5.Grassland

6.Tree & Groves

7.Current Fallow

8.Net Sown Area

9.Others

LAND USE / LAND COVER CLASSIFICATION SYSTEM

LEVEL - 1	LEVEL - 2	LEVEL - 3	SYMBOL		
1 Built – up land	1.1	Towns/Cities & Industries	01 &1a		
	1.2	Villages	02		
2 Agricultural Land	2.1	Crop land	2.1.1	Kharif	03
			2.1.2	Rabi	04
			2.1.3	Summer	4a
			2.1.4	Kharif + Rabi (Doublecropped)	05
	2.2	Fallow	06		
	2.3	Plantation	07		
	3 Forest	3.1	Evergreen/ Semi-evergreen	3.1.1	Dense
3.2.2				Open	09
3.2		Deciduous (Moist & Dry)	3.2.1	Dense	10
			3.2.2	Open	11
3.3		Scrub Forest	12		
3.4		Degraded Forest	13		
3.5		Forest Plantations	14		
3.6		Mangroves	15		

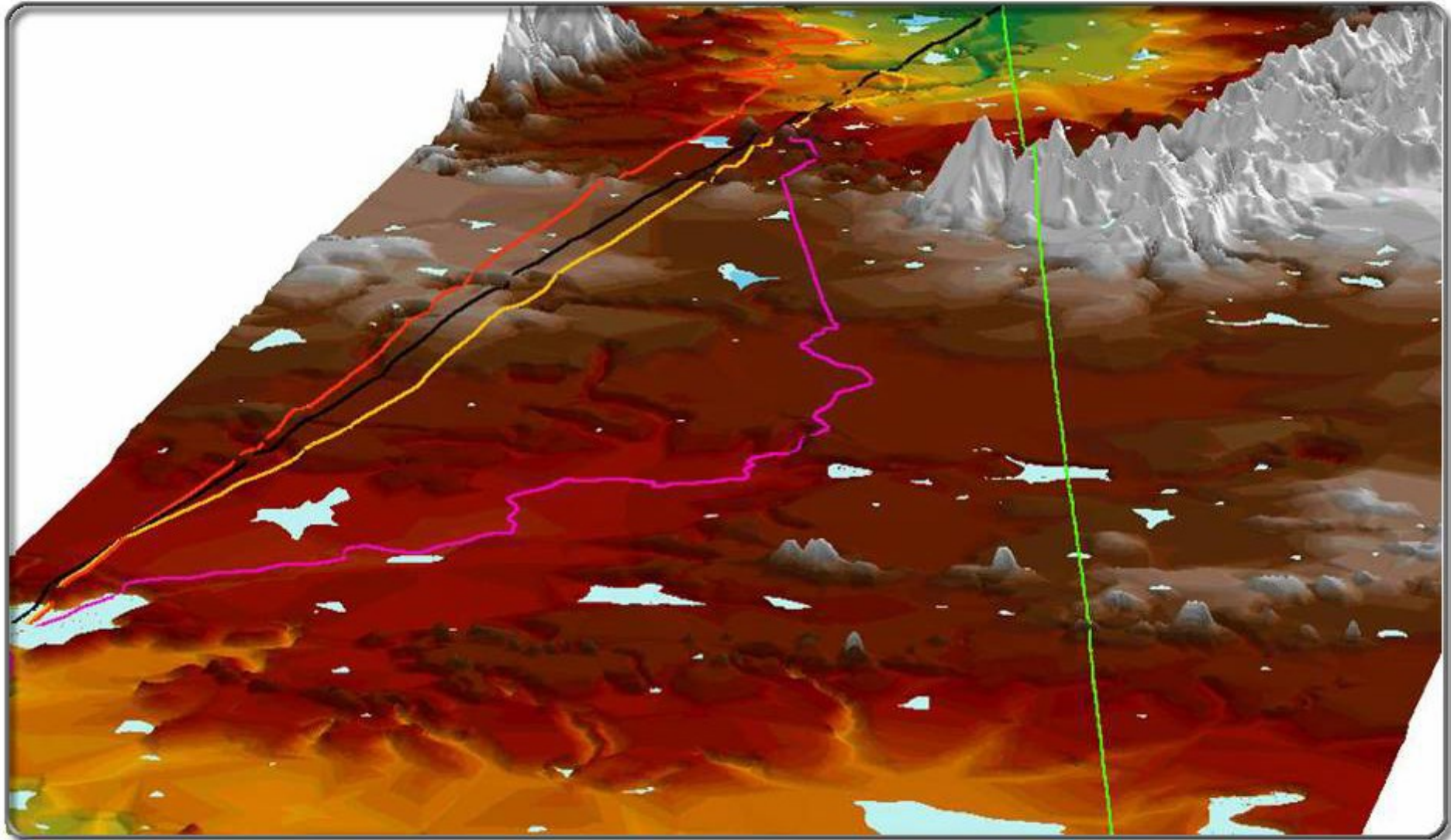
LAND USE / LAND COVER CLASSIFICATION SYSTEM

4	Wastelands	4.1	Salt Affected Land	16
		4.2	Waterlogged Land	17
		4.3	Marshy / Swampy Land	18
		4.4	Gullied / Ravinous Land	19
		4.5	Land with scrub	20
		4.6	Land without scrub	21
		4.7	Sandy area (Coastal & Desertic)	22
		4.8	Mining/ Industrial Wasteland	23
		4.9	Barren Rocky / Stony Waste/ Sheet Rock Area	24

LAND USE / LAND COVER CLASSIFICATION SYSTEM

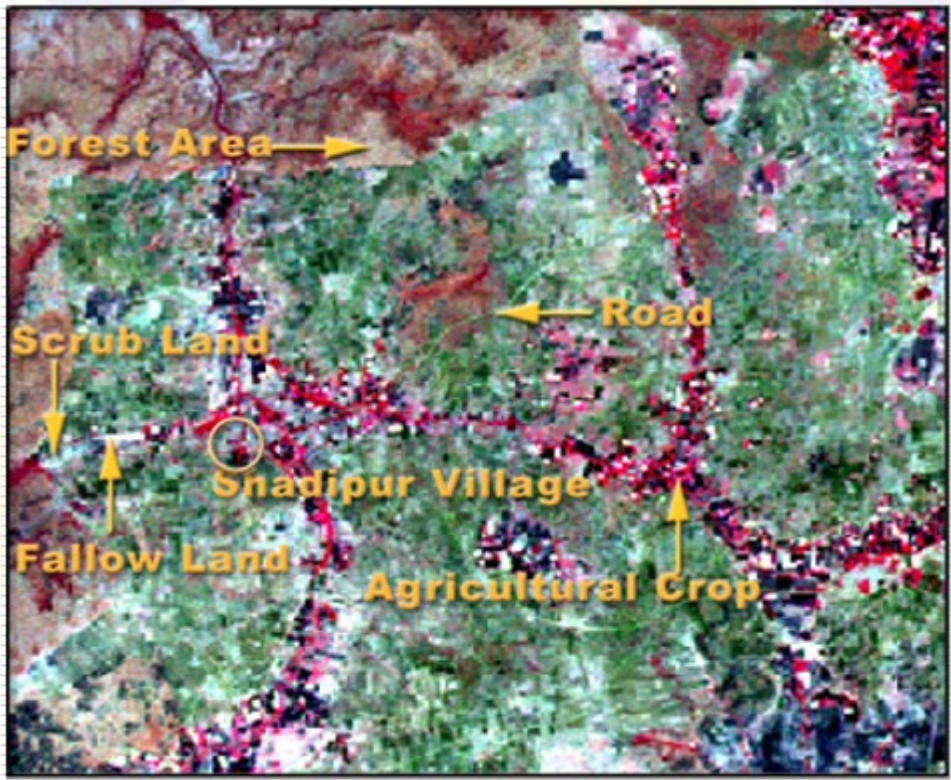
5	Water Bodies	5.1	River / Stream		-	
		5.2	Canals		-	
		5.3	Lake / Reservoirs / Tanks		25	
6	Others	6.1	Shifting Cultivation		26	
		6.2	Grassland/ Grazing land	6.2.1	Dense	27
				6.2.2	Degraded	28
		6.3	Salt Pans		29	
		6.4	Snow covered / Glacial Area		30	
		6.5	Prosophys Juliflora		31	
		6.6	Aquaculture Pond		32	
		6.7	Habitation With Vegetation		33	
		6.8	Mixed Vegetation		34	
6.9	Tree Groves		35			

A TYPICAL EXAMPLE OF THREE DIMENSIONAL VIEW OF TOPOGRAPHY

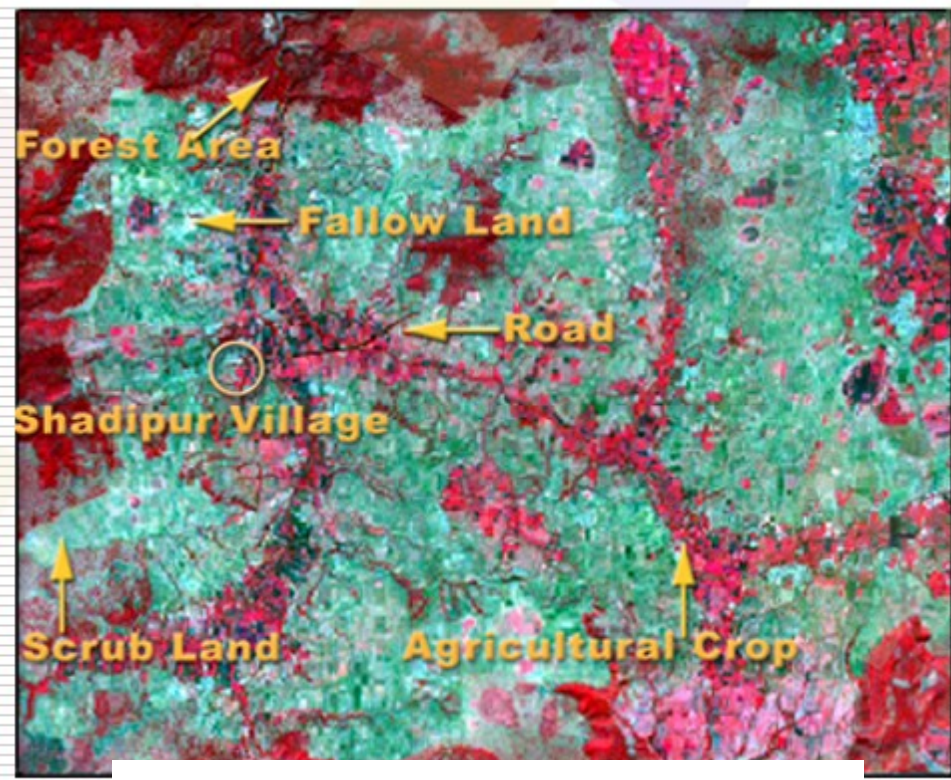


Impact Assessment Study of Kattangidda Nala watershed

IRS IC / 10 LISS III Satellite Image : Parts of Kattangidda Nala Watershed

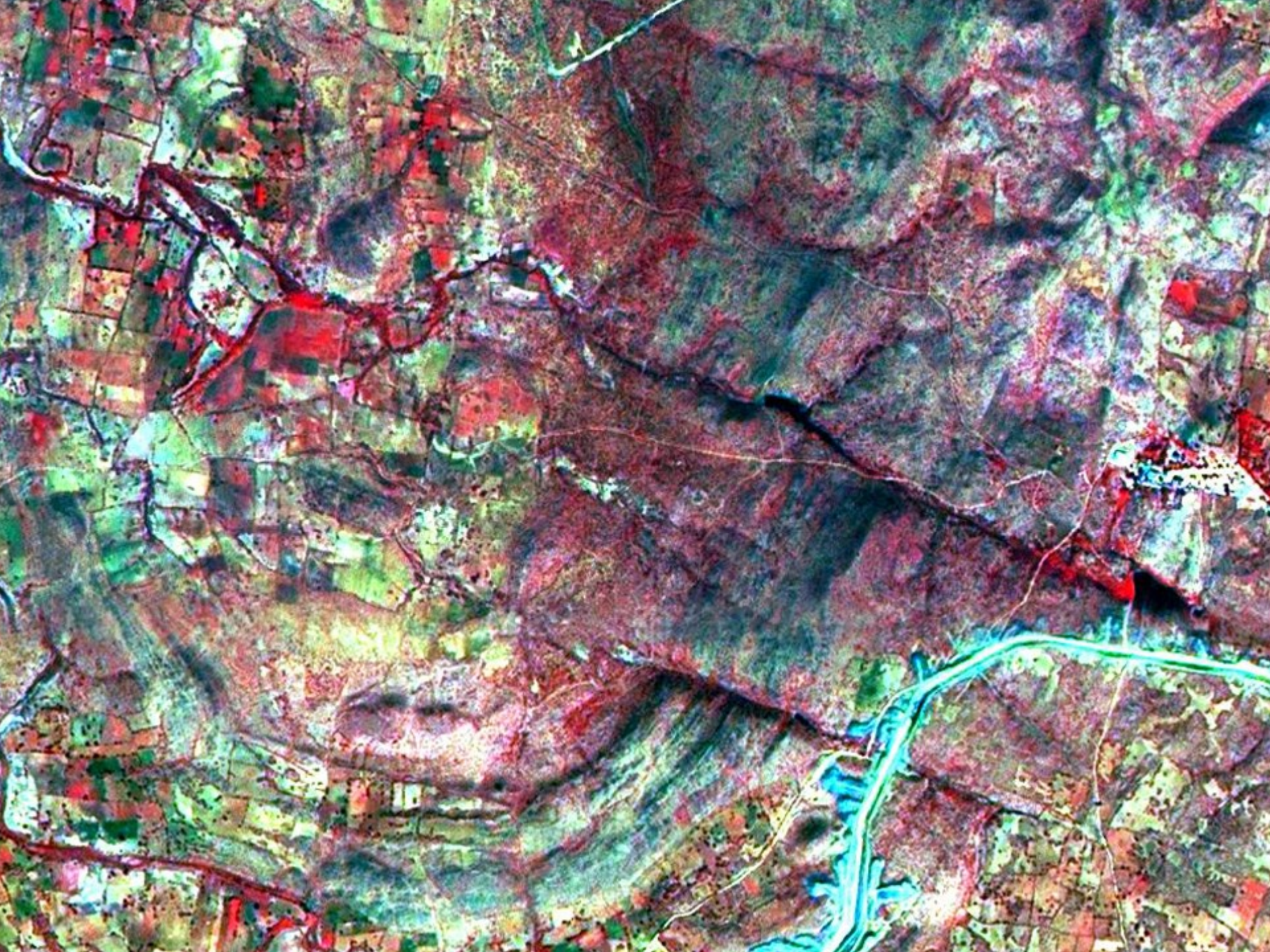


1997 [Before Treatment]



2001 [After Treatment]

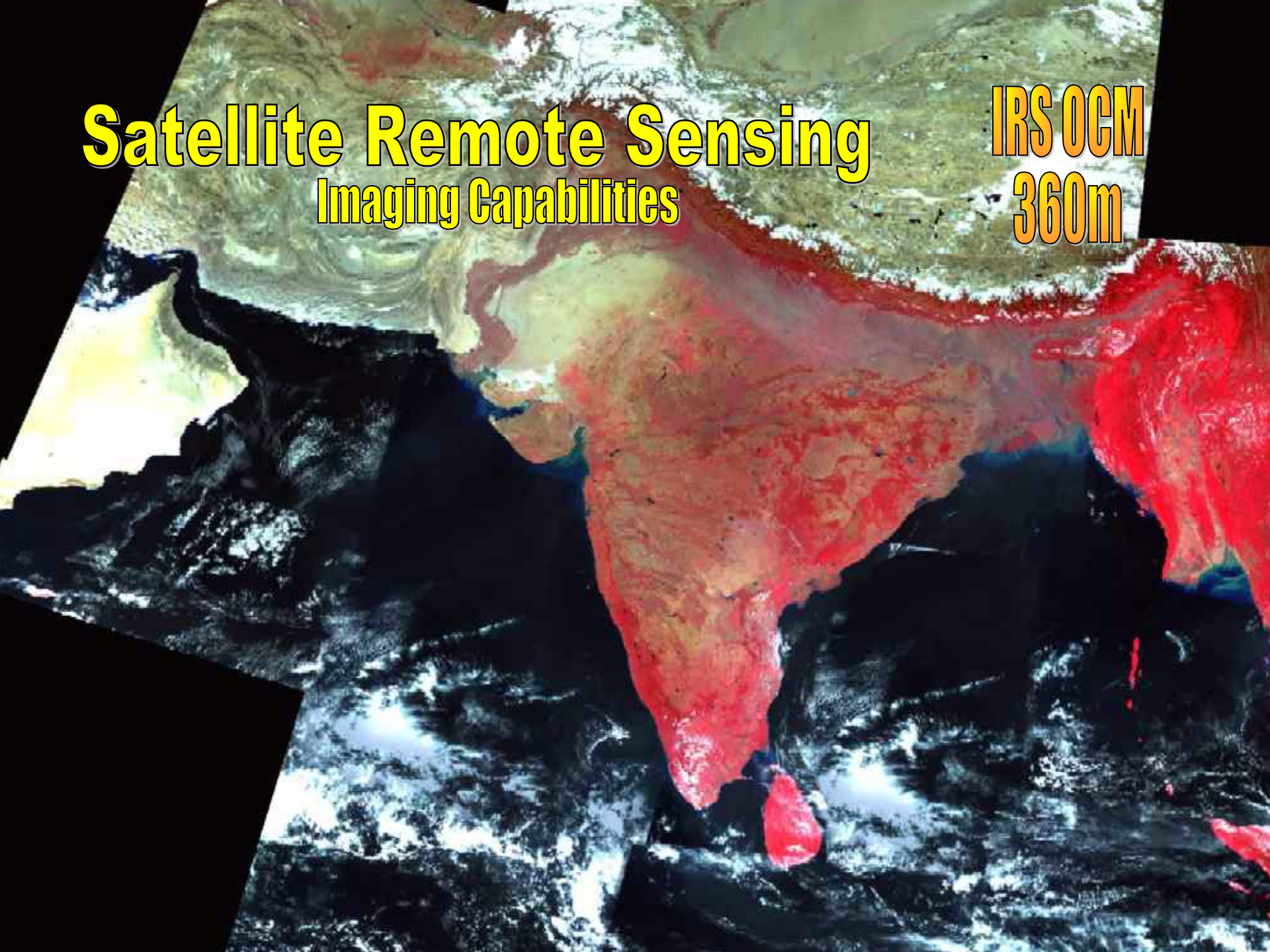
LEGEND			
Agri. Crop		Scrub Land	
Fallow Land		Settlement	
Forest Area			



Satellite Remote Sensing

Imaging Capabilities

IRS OCM
360m



A lush green forest with a waterfall cascading over rocks in the foreground. The scene is filled with dense foliage and vibrant green leaves. The waterfall is the central focus, with white water splashing over dark, wet rocks. The overall atmosphere is serene and natural.

Thank You
Thank You