Deforestation in India: From a Forest, Water and Peoples Perspective

Presenter: Marimuthuram Mahendran

Introduction

- Two of 24 global biodiversity hotspots are in India
- Western Ghats and Eastern Himalayas
- Socio- economic, political and ecological consequences
- Western Ghats showed a loss of 25.6% in total forest cover (Jha *et al*, 2000).
- Decrease in open forest by 33.2% (Jha *et a*l, 2000).
- Western and Eastern Himalayas constitute 30% forests in India.
- FSI reports steady increase in forest cover
- Laurence *et al* shows that this data is misleading (Laurence *et a*l, 2010).

Forest culture and its erosion.

- ‘Forests have nurtured India's mind and India's civilization’ – Tagore
- Indian culture was cradled by Forests (Vedic era and times Buddha)
- Forests were central in civilizational evolution
- Aranya Samskriti
- Scientific research and cultural writings emerged from forests.
- Erosion – colonial methods of management
- Teak, Sal and coniferous trees – British Empire.
- Destruction of forests and the culture that conserved it.

(Romila.T, 2001).

Conflicts over forests

- First Phase - met the needs of British Empire
- Second Phase – Post colonial – rapid industrialization
- Third Phase – Social forestry and Waste land Development Programs
- Fourth Phase :
  - International Finance
  - Biomass conversion to petroleum products
  - Transnationalization of Forests

Conflicts over water

- Inter state conflicts
- State planned mining and timber extraction (downstream)
- State planned agricultural production
- Hydro electric power projects (ex. Kabini project)
- States plans benefit the economically powerful groups.
- Increases rich – poor gap – access to water resources.

Case Study

Analyzing deforestation rates, spatial forest cover changes and identifying critical areas of forest cover changes in North-East India during 1972 – 1999.

Nikhil Lele. P.K.Joshi

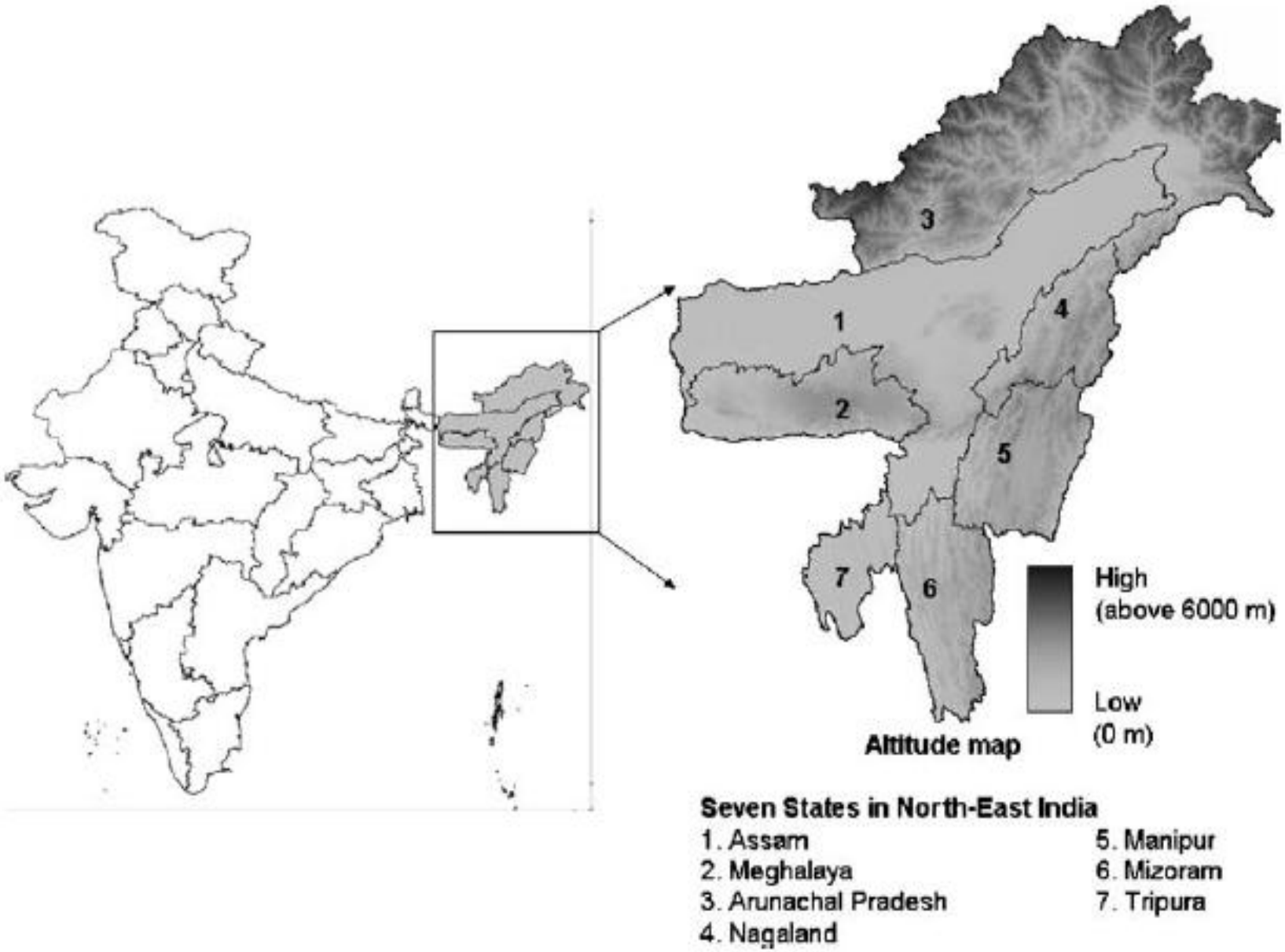


Fig. 1 Location map of North-East India with showing digital elevation map of the region

(Nikhil & Joshi, 2009)

Questions

- What are the deforestation rates, spatial forest cover changes and critical areas of forest cover changes in North-East, India during 1972-1999?

- What are the factors influencing forest cover changes in North-East India?

(Nikhil & Joshi, 2009)

Approach

- Temporal forest cover datasets obtained from NRSA and FSI.
- Landsat MSS data in the time intervals 1972-75 and 1980-82 , 1:250,000 scale.
- This scale, the region was mapped in multiple tiles of 1˚x1˚ acquired, scanned, geo-referenced and converted (digital).
- ERDAS Imagine 8.7, ArcGIS 8.3 was used to import into geo-spatial environment.
- Variables:

  - Open (40-10% canopy density)
  - Closed (>40% canopy density)

$$\text{Deforestation rate} = \frac{(\log F_{t2} - \log F_{t1}) \times 100}{t2 - t1}$$

(Nikhil & Joshi, 2009)

Table 1 Forest cover in the North-East India 1972–1999

State	1972		1982		1987		1989		1993		1999	
	Area (km^2)	Area %	Area (km^2)	Area %	Area (km^2)	Area %	Area (km^2)	Area %	Area (km^2)	Area %	Area (km^2)	Area %
Arunachal Pradesh	51,438	61.54	52,104	62.34	69,002	82.3	68,757	82.1	68,621	81.9	68,045	81.25
Assam	21,055	26.81	19,796	25.21	24,832	33.2	24,751	31.6	24,061	30.7	27,714	35.33
Manipur	15,090	67.49	13,572	60.70	17,685	80	17,685	79.2	17,558	78.6	16,926	75.81
Meghalaya	14,390	63.98	12,458	55.39	15,645	69.8	15,875	70.8	15,714	70.1	15,584	69.48
Mizoram	13,860	65.72	11,971	56.76	18,170	86.2	18,853	89.4	18,576	88.1	17,494	82.98
Nagaland	8,154	49.33	8,095	48.97	14,399	86.8	14,321	86.4	14,291	86.2	13,345	80.49
Tripura	6,330	60.40	5,138	49.03	5,535	50.08	5,535	52.8	5,538	52.8	7,065	67.38
Entire North-east	13,0317	51.09	123,134	48.28	165,268	65.39	165,777	65.41	164,359	64.43	166,173	65.14

Table 2 Deforestation rates for during 1972 to 1999 for total forest cover changes in the North-East India

State	Year 1972–1982	Year 1982–1987	Year 1987–1989	Year 1989–1993	Year 1993–1999
Arunachal Pradesh	−0.056	−0.0061	0.077	0.021	0.061
Assam	0.268	−0.00492	0.070	0.307	−1.023
Manipur	0.460	−0.00575	0.00	0.078	0.265
Meghalaya	0.626	−0.00495	−0.316	0.110	0.060
Mizoram	0.636	−0.00906	−0.801	0.160	0.434
Nagaland	0.032	−0.01251	0.117	0.022	0.495
Tripura	0.906	−0.00162	0.00	−0.005	−1.762
Entire NE	0.246	−0.00639	−0.066	0.093	−0.079

(Nikhil & Joshi, 2009)

Fig. 3 Areas of forest cover dynamics in the north-eastern region

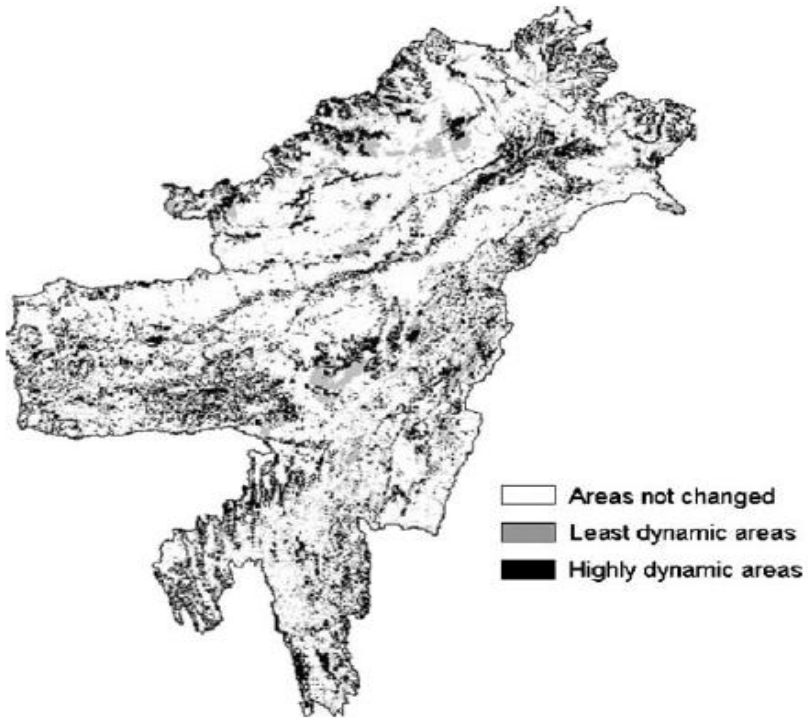
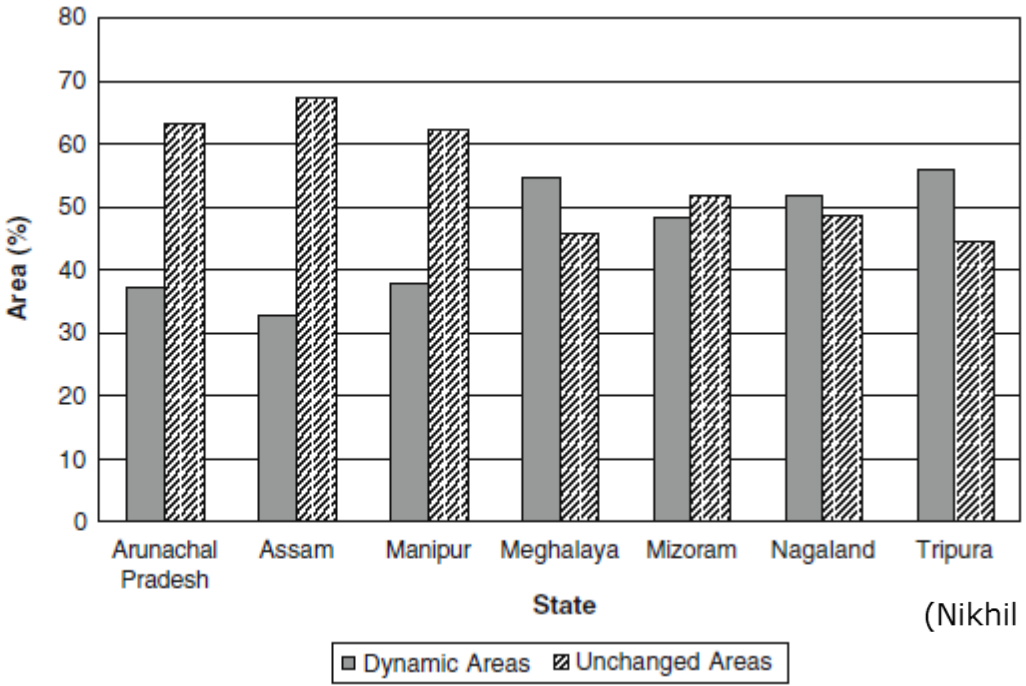


Fig. 4 Dynamic and unchanged areas in north-eastern states

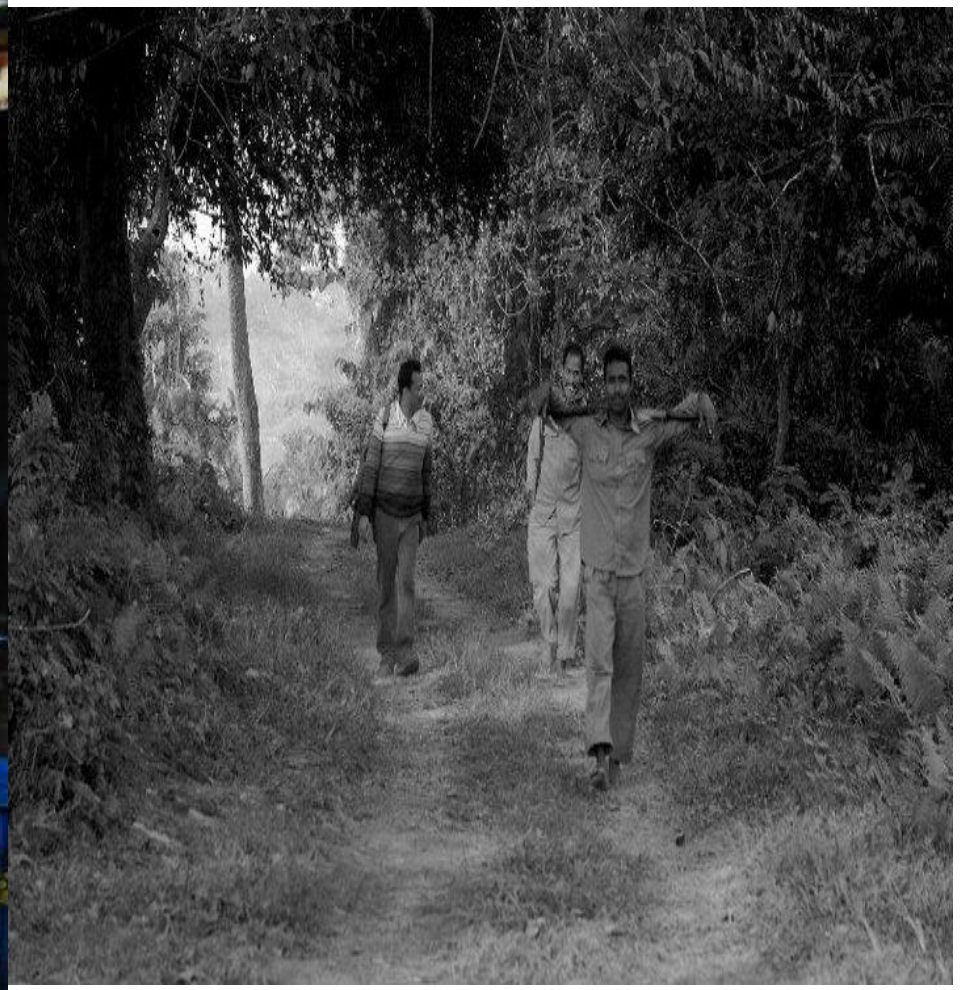


(Nikhil & Joshi, 2009)

Conclusion

- Meghalaya, Mizoram, Nagaland and Tripura have dynamic areas of forest cover due to human interference.
- Reason: Conversion of forest to shifting cultivation or permanent agriculture, extensive mining.
- Arunachal Pradesh, Assam and Manipur have lower dynamic areas and an overall gain in forest cover.
- Reason: Strict measures to protect reserve forests ,allowing regrowth of forest in the lands (jhum).
- Arunachal Pradesh, primary forest cover remained unchanged.
- Reason: Complexity of the terrain and high altitudes

(Nikhil & Joshi, 2009)



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