

Spatial Analyses of Forest Cover at District Level in Uttar Pradesh, India

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Abstract

In this paper spatial analyses of Forest cover at District level was calculated and mapped in Uttar Pradesh. Study is based on secondary data collected from official website of Government of India. Forest area comprises very dense forest, mod dense forest and opens forest. Forest cover was classified in five categories based on Natural Breaks (Jenks) scheme. First with forest cover more than 15 Percent, second with forest cover 9.25 to 14.99 Percent, third with forest cover 3.95 to 9.24 Percent, fourth with forest cover 3.78 to 3.94 Percent and fifth with forest cover less than 3.78 Percent. Result shows eight districts belong to first category, four districts belong to second category, ten districts belong to third category, twenty districts belong to fourth category and twenty five districts belong to fifth category.

Keywords: Forest cover, Spatial analyses, Uttar Pradesh

1. Introduction

A forest is a large area of land covered with trees or other woody vegetation.[1] Hundreds of more precise definitions of forest are used throughout the world, incorporating factors such as tree density, tree height, land use, legal standing and ecological function.[2] According to the widely used United Nations Food and Agriculture Organization definition, forests covered four billion hectares (15 million square miles) or approximately 30 percent of the world's land area in 2006.[3]

In 2002, forestry industry contributed 1.7% to India's GDP.[4] Forests constitute about 6.8% of the total geographical area of the Uttar Pradesh. The terai and bhabhar area in the Gangetic Plain have most of the forests. The Vindhyan forests consists mostly of scrub.

After a separate state of Uttarakhand was carved out of Uttar Pradesh, the forest cover of the state had decreased by 40 percent. Uttar Pradesh's forest cover, which stood at 14,127 square km in 2007, has gone up to 14,341 sq km, as per the survey carried out in November 2009. The survey has also recorded a substantial rise in the density of the forest cover, thanks to campaigns launched by department of Social Forestry and Department of Forest. In terms of percentage, this may not appear really great, yet it reflects a positive trend. The green cover in the state has registered marginal increase from 5.86 percent to 5.95 percent of the state's total area. While the national average of green cover is 21 percent. Even though the rise is marginal, it is quite significant considering the fact that green cover is gradually going down in most parts of the country due to immense population pressure. [5]

2. Materials and Methods

2.1. Study Area

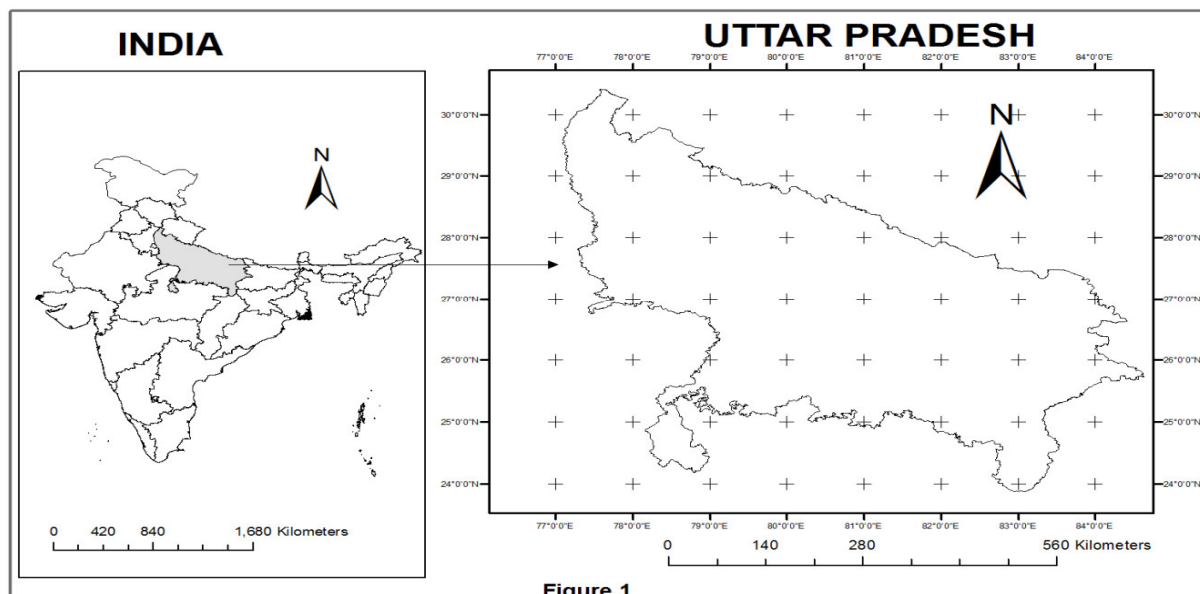


Figure 1

Uttar Pradesh, with a total area of 243,290 square kilometres, is India's fourth largest state in terms of land area. It is situated on the northern spout of India and shares an international boundary with Nepal. The Himalayas border the state on the north but the plains that cover most of the state are distinctly different from those high mountains. The larger Gangetic Plain region is in the north; it includes the Ganges-Yamuna Doab, the Ghaghra plains, the Ganges plains and the Terai. The smaller Vindhya Range and plateau region is in the south. [6]

It is characterised by hard rock strata and a varied topography of hills, plains, valleys and plateaus. The Bhabhar tract gives place to the terai area which is covered with tall elephant grass and thick forests interspersed with marshes and swamps. The sluggish rivers of the bhabhar deepen in this area, their course running through a tangled mass of thick undergrowth. The terai runs parallel to the bhabhar in a thin strip. The entire alluvial plain is divided into three sub-regions. [7]

Uttar Pradesh has a humid subtropical climate and experiences four seasons. [8] The winter in January and February is followed by summer between March and May and the monsoon season between June and September.[9] Summers are extreme with temperatures fluctuating anywhere between 0 °C and 50 °C in parts of the state.[10] The Gangetic plain varies from semiarid to sub-humid. The mean annual rainfall ranges from 650 mm in the southwest corner of the state to 1000 mm in the eastern and southeastern parts of the state.[11]

2.2. Materials

Data: Secondary data collected from official website of government of India.

Software: ArcGIS 10.1, Excel

2.3 Methodology

Study is based on secondary data collected from official website of Government of India. Forest area comprises very dense forest, mod dense forest and opens forest. Forest cover was classified in five categories based on Natural Breaks (Jenks) scheme. First with forest cover more than 15 Percent, second with forest cover 9.25 to 14.99 Percent, third with forest cover 3.95 to 9.24 Percent, fourth with forest cover 3.78 to 3.94 Percent and fifth with forest cover less than 3.78 Percent.

3. Result

Result shows eight districts belong to first category (Table 1), four districts belong to second category (Table 2), ten districts belong to third category (Table 3), twenty districts belong to fourth category (Table 4) and twenty five districts belong to fifth category (Table 5).

Table 1 Districts with forest cover more than 15 Percent

SN	Districts	Area Km ²	Very Dense	Mod Dense Forest	Open Forest	Total F Km ²	Percent
1	Sonbhadra	6788	45	870	1626	2541	37.43
2	Chandauli	2549	6	194	365	565	22.17
3	Pilibhit	3499	340	157	200	697	19.92
4	Mirzapur	4521	0	323	543	866	19.16
5	Chitrakoot	3092	0	358	203	561	18.14
6	Balrampur	2981	225	188	116	529	17.75
7	Lakhimpur Kheri	7680	409	475	435	1319	17.17
8	Maharajganj	2952	239	113	109	461	15.62

Source : <https://data.gov.in>

Table 2 Districts with forest cover 9.25 to 14.99 Percent

SN	Districts	Area Km ²	Very Dense Forest	Mod Dense Forest	Open Forest	Total F Km ²	Percent
1	Lucknow	2528	0	116	185	301	11.91
2	Lalitpur	5039	0	128	442	570	11.31
3	Saharanpur	3689	0	175	200	375	10.17
4	Bijnor	4561	45	235	142	422	9.25

Source : <https://data.gov.in>

Table 3 Districts with forest cover 3.95 to 9.24 Percent

SN	Districts	Area Km ²	Very Dense Forest	Mod Dense Forest	Open Forest	Total F Km ²	Percent
1	Etawah	2311	0	44	142	186	8.05
2	Agra	4027	0	67	209	276	6.85
3	Bahraich	3439	145	158	122	424	6.17
4	Shravasti	3439	145	157.5	121.5	424	6.165
5	Unnao	4558	0	26	224	250	5.48
6	Jalaun	4565	0	65	179	244	5.35
7	Hamirpur	4282	0	66	108	174	4.06
8	Sultanpur	4436	0	15	162	177	3.99
9	Jhansi	5024	0	33	167	200	3.98
10	Bulandshahr	2910	0	33	82	115	3.95

Source : <https://data.gov.in>

Table 4 Districts with forest cover 3.78 to 3.94 Percent

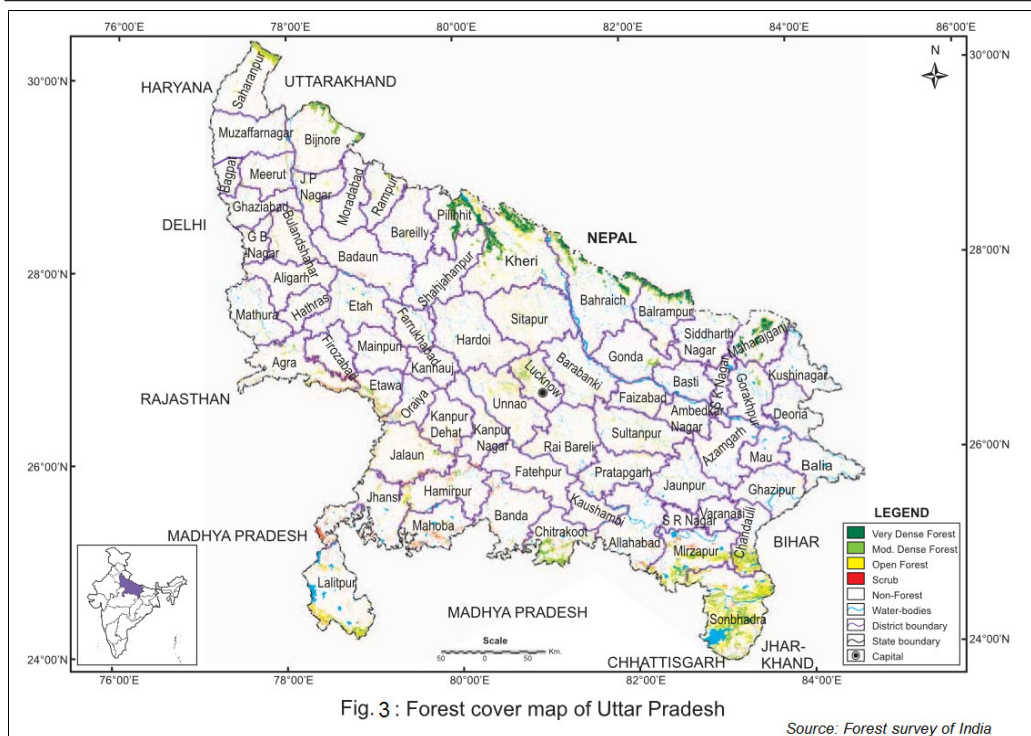
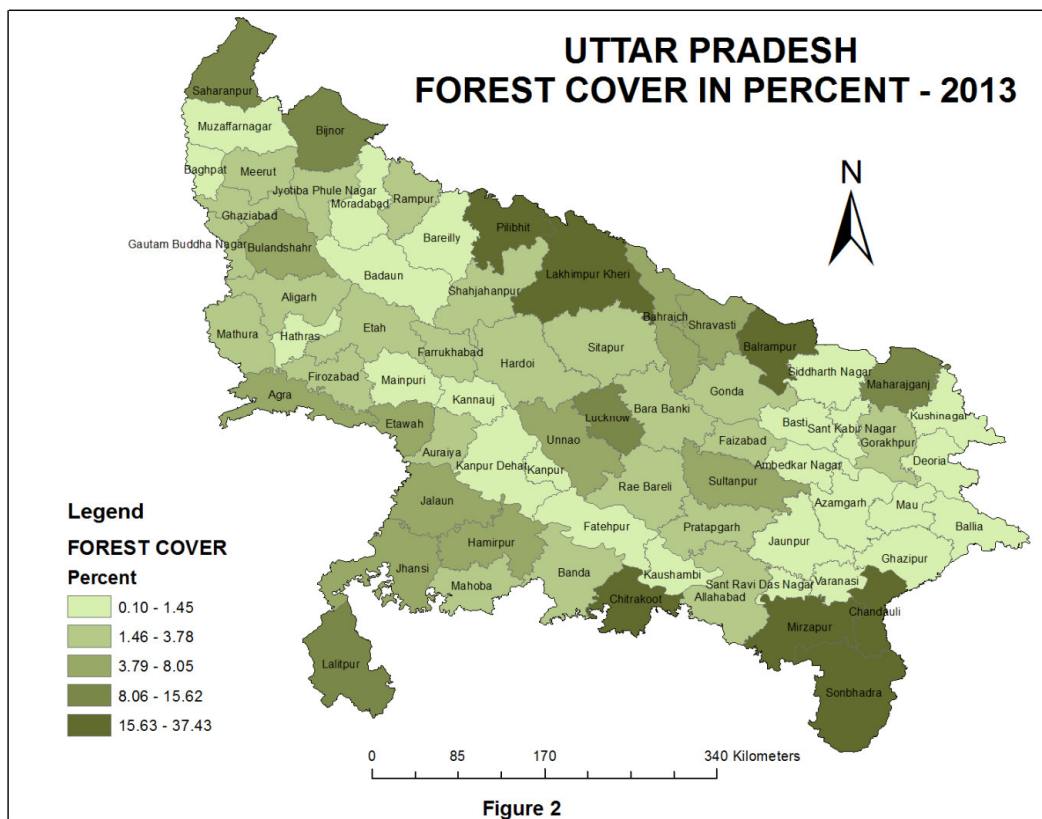
SN	Districts	Area Km ²	Very Dense Forest	Mod Dense Forest	Open Forest	Total F Km ²	Percent
1	Jyotiba Nagar	2249	0	24	61	85	3.78
2	Sitapur	5743	0	14	199	213	3.71
3	Auraiya	2015	0	8	61	69	3.42
4	Mahoba	2884	0	22	73	95	3.29
5	Rampur	2367	4	26	47	77	3.25
6	Shahjahanpur	4575	23	63	36	122	2.67
7	Gonda	4003	0	60	47	107	2.67
8	Meerut	2590	0	34	32	66	2.55
9	Faizabad	2174	0	5	50	55	2.53
10	Pratapgarh	3717	0	25	68	93	2.50
11	GBN	1442	0	12	23	35	2.43
12	Banda	4532	0	26	77	103	2.27
13	Etah	4446	0	9	90	99	2.23
14	Rae Bareli	4609	0	5	93	98	2.13
15	Farrukhabad	2181	0	13	33	46	2.11
16	Hardoi	5986	0	7	114	121	2.02
17	Firozabad	2361	0	4	43	47	1.99
18	Gorakhpur	3321	0	40	24	64	1.93
19	Bara Banki	4402	0	4	79	83	1.89
20	Ghaziabad	2590	0	18	31	49	1.89
21	Allahabad	5137	0	27	68	95	1.85
22	Aligarh	3650	0	7	59	66	1.81
23	Mathura	3340	0	5	55	60	1.80

Source : <https://data.gov.in>

Table 5 Districts with forest cover less than 3.77 Percent

SN	Districts	Area Km ²	Very Dense Forest	Mod Dense Forest	Open Forest	Total F Km ²	Percent
1	Ambedkar Nagar	2337	0	2	32	34	1.45
2	Siddharth Nagar	2895	0	9	30	39	1.35
3	Kannauj	2093	0	0	28	28	1.34
4	Baghpat	1321	0	5	12	17	1.29
5	Kaushambi	2124	0	7	20	27	1.27
6	Jaunpur	4038	0	11	40	51	1.26
7	Hathras	1840	0	1	22	23	1.25
8	Kushinagar	2906	0	3	32	35	1.20
9	Fatehpur	4152	0	7	38	45	1.08
10	Bareilly	4120	0	7	37	44	1.07
11	Muzaffarnagar	4008	0	14	27	41	1.02
12	Ghazipur	3377	0	1	30	31	0.92
13	Kanpur Dehat	3088	0	6	49	55	0.88
14	Kanpur	3088	0	6	49	55	0.88
15	Badaun	5168	0	12	30	42	0.81
16	Varanasi	1528	0	1	11	12	0.79
17	Ballia	3349	0	0	25	25	0.75
18	Moradabad	3718	0	5	21	26	0.70
19	Basti	2688	0	5	13	18	0.67
20	Azamgarh	4234	0	1	26	27	0.64
21	Deoria	2538	0	1	14	15	0.59
22	Mainpuri	2760	0	1	13	14	0.51
23	Mau	1713	0	0	7	7	0.41
24	Sant Kabir Nagar	1646	0	0	2	2	0.12
25	Sant Ravi Das	1015	0	0	1	1	0.10

Source : <https://data.gov.in>



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