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BUNDELKHAND REGION: A GEOGRAPHICAL ANALYSIS OF LAND USE DYNAMICS

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Abstract

The substantial increase of population in India has put enormous pressure on its land and other natural resources. The land man ratio is decreasing and will continue to intensify further in future. The demand for land is enormous and it results in large scale land transformations. The changes in land use have significant impact on livelihood of population as well as on ecological conditions of the areas. This paper therefore, attempts to examine the land use dynamics of Bundelkhand region of Uttar Pradesh as a whole as well as among its districts during the period of 2000-01 to 2010-11 and its implications on ecology and livelihood of people by budgeting different categories of land use. In Bundelkhand region, in spite of the inhospitable physical conditions, agriculture is the single most important activity in sustaining livelihoods of people. But, the study reveals that the agricultural land is continuously being transformed to non-agricultural uses as there is decrease of 49,556 hectares of land in agricultural sector while in non-agricultural sector, there is an increase of 35,286 hectares during 2000-01 to 2010-11. The study also highlights that during the same period, the share of agricultural workers also declined from 72.1 per cent to 69.4 per cent. The land use change has direct impact on the livelihood of the people in the region.

Introduction

Survival of humans largely depends on resources which primarily come from land. Marsh (1864) pointed out that earth's ability to provide many ecosystem services upon which humans depend, is rapidly exhausting. This change is unabated and in recent times the pace of land transformation has further accelerated. The changes in land use are largely attributed to increase in population which creates demand for more and more land.

The landscape is modified and gets degraded by many of human activities. Degradation of land resources also degrades

our life support system, which is a cause of concern as land is finite as well as essential resource for our future generations. Two important trends have been noticed first, the total land area dedicated to human uses (e.g. settlement, agriculture, forestry etc.) has grown significantly and second, increasing production of goods and services has intensified both use and control of land. Much of earth's habitable surface is dedicated to human use, mostly for production of food and fiber. Therefore, global area of forests and woodlands has declined by about 30 per cent, while world croplands have increased by 450 per cent since the 18th century (Richards, 1990).

Significantly, these changes have been more pronounced in the last 50 years. Interestingly, during this recent period of rapid transformation, tropical regions, especially Asia, is experiencing the highest rates of change (Houghton et al., 1991). In Indian context, land use/cover change analysis also has great importance, because of the pressure on land due to growing population (Rao and Pant, 2001). India occupies 2.4 per cent of world's land area, carries more than 1200 million people over its land (18 per cent of the world population). Great physical diversity and large population has significant bearing on land use/cover of the country. The increasing population is putting pressure on forest and agricultural land. Significantly, 85 per cent of India's cultivable land is in agricultural sector but with transformations in economic sector there is an increasing trend of its conversion to non-agricultural sectors.

India being an agrarian country and, land being one of the most basic natural resource, is always subject of debate regarding its effective use. Studies have shown that there is a tendency for land shifts to the agricultural sector, but in recent years, increase is also found in fallow lands which further transform into cultivable wastes (Pandey and Tewari, 1987). Several studies have highlighted the phenomena of land transformation, and pointed that rapid pace of economic development along with growth of population, urbanization and industrialization exert tremendous pressure on the limited natural resource base of the country. The changes in land use over time have important implications; the pre-eminent being the effect on ecology and economic activities which ultimately affect the quality of people's lives. A complete land use budgeting can reveal the dynamics of land use change and their implications on ecology, livelihoods and developments. In the light of the above, the present study pertaining to land use dynamics of Bundelkhand region has been taken up.

Objectives

The objectives of the present study are:

- to examine the land use dynamics by budgeting the land use changes in Bundelkhand region for the period from 2000-01 to 2010-11;
- to evaluate the trends of land transformation in Bundelkhand region; and
- to assess the implications of land use change on ecology and livelihood in Bundelkhand region.

Study Area

Bundelkhand region consists of 13 districts spreading over two states of Uttar Pradesh and Madhya Pradesh. The present study pertains to seven districts of Bundelkhand region, which lie in the state of Uttar Pradesh (Fig. 1). Bundelkhand region of Uttar Pradesh comprises of two divisions, viz. Chitrakoot and Jhansi and a total of seven districts, namely, Banda, Chitrakoot, Hamirpur, Mahoba, Jalaun, Jhansi and Lalitpur. The region spreads over an area of 29,418 km², which constitutes roughly 12 per cent of total area of the state (Table 1). Total population of the region as per the Census of 2011 was 9.6 million, which was less than 5 per cent of the total population of the state. Among the districts, Jhansi is the most populated district, while Mahoba is the least populated district in the region. The region recorded 18.8 per cent growth of population during 2001-11 and this was lower than the growth (20.23 per cent) witnessed by the state as a whole. The density of population is 325 persons per km². The region lies between the Indo-Gangetic plain to the north and Vindhya Range to the south. The resource base of the region is poor and insufficient to sustain the human and livestock population. Productivity of the resources such as land, water, forest and livestock is also low and a significant part of the land is barren and rocky. The region also suffers from low and unreliable rainfall and extreme climatic

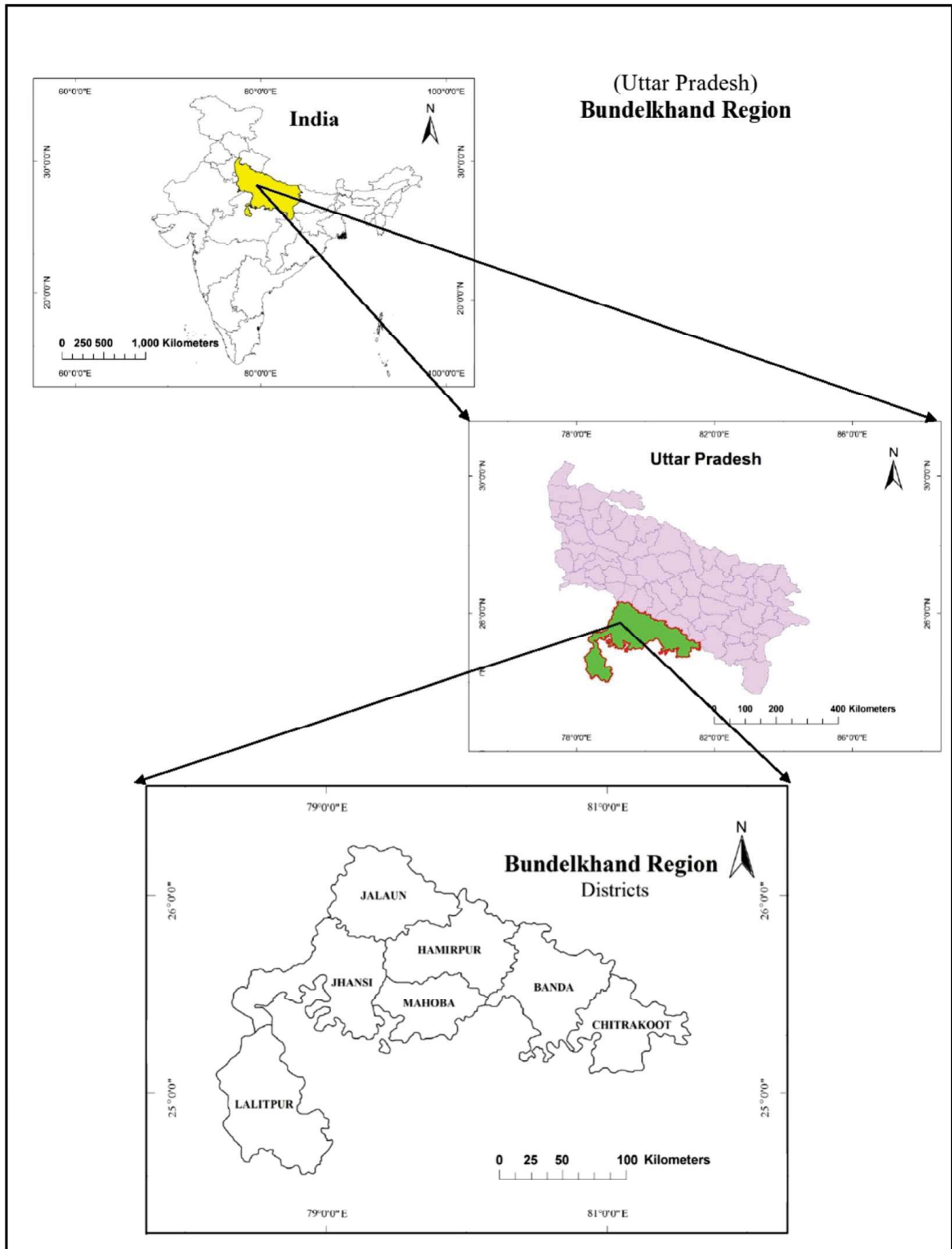


Fig. 1

Table 1
Bundelkhand Region: Area and Demographic Profile, 2011

District	Area (km ²)	Population (lakh)	Decadal Variation of Population* (2001-11)	Density of Population per km ²	Sex Ratio	Urban Population (Per cent)
Banda	4408	17.99	17.05	408	863	15.32
Chitrakoot	3216	9.91	29.43	308	879	9.71
Hamirpur	4021	11.04	5.80	275	861	19.00
Jalaun	4565	16.89	16.19	370	865	24.79
Jhansi	5024	19.98	14.54	398	890	41.70
Lalitpur	5039	12.21	24.94	242	906	14.36
Mahoba	3144	8.75	23.64	279	878	21.16
Bundelkhand	29417	96.81	18.80	325	877	20.86
Uttar Pradesh	240924	1998.12	20.23	829	912	22.27

Source: Census of India, 2011 * Per cent

conditions. The average rainfall of the region as a whole is around 750 mm, which is much below the state average. Variations in rainfall are quite significant across districts in the region. The region suffers from deficiency of rainfall and drought conditions are a common phenomenon. The typical qualities of soil and extreme climatic conditions also affect the productivity of forest based products, horticulture, agricultural crops and even livestock mainly due to shortage of adequate water and fodder. In spite of the inhospitable land and climate, the dependence on agriculture remains high as the industrial base of the region is very poor.

Data and Methodology

For the present study, district level data were compiled from the land use archives for two time periods i.e. 2000-01, and 2010-11. The study is based on secondary datasets which were collected from publications of the official agricultural and economic statistics; Land use Statistics, published by Directorate of Economics and Statistics, Ministry of Agriculture, Government of India.

The land use statistics in India are generally reported as R = Total reported area which is further classified as: F_r = Area under forests; P = Area under permanent pastures; M = Area under miscellaneous tree crops and

grooves; B = Barren lands; W = Culturable wastelands; F_c = Current fallows; F_o = Fallow lands other than current fallows; C = Net sown area and N = Area under non-agricultural uses.

In the first accounting total reporting area consisting of forest, permanent pasture, land under miscellaneous tree and groves, culturable waste land, current fallows, other fallow land, net sown area and land under non-agricultural uses was linearly summed up as under:

$$R = F_r + P + M + B + W + F_c + F_o + C + N$$

The dynamics of land-use shifts was examined with the help of a simple identity of linearly additive land use changes. The net change in reporting area is counted by calculating the changes in different land use classes as under:

$$\Delta R = \Delta F_r + \Delta P + \Delta M + \Delta B + \Delta W + \Delta F_c + \Delta F_o + \Delta C + \Delta N$$

This study further categorizes the total land endowment (reporting area) into three broad sectors i.e. ecological sector (E), agricultural sector (A) and non-agricultural sector (N) as under:

$$\Delta R = \Delta E + \Delta A + \Delta N$$

The ecological sector comprising several minor sectors was further divided into two sub-sectors, viz. the enviable ecology (EE) and unenviable ecology (UE) as under:

$$\Delta E = \Delta EE + \Delta UE$$

The changes of enviable ecological

sector consist of changes in forest, permanent pasture and land under miscellaneous tree and groves, while, unenviable ecology represents changes in land under barren and un-cultivable uses (Fig. 2).

The study assumes that land use shifts have ecological implications. For example, if the land transformation takes place from unenviable to enviable ecology, then it would have favourable ecological effects but if the land of enviable ecology shifts to unenviable ecology then it may result in adverse impact on ecology. Even land use dynamics within enviable ecology may also have ecological implications. If land shifts from permanent pasture and miscellaneous tree and groves to forest, this change is considered to have positive ecological implications. On the other side, negative ecological implications would be inflicted if the forest land is converted into permanent pastures.

$$\Delta EE = \Delta F_r + \Delta P + \Delta M$$

$$\Delta UE = \Delta B$$

The agricultural sector also consists of four sub-land use classes i.e. cultivable waste land, other fallows, current fallows and land under net sown area. The net change in agricultural sector, if positive (+ ΔA), it will be at the cost of ecological sector which means that it draws land from forest, permanent pastures and land under miscellaneous tree and groves. When the net change in agricultural sector is negative (- ΔA), the land use shift may occur to either the ecological sector (enviable/unenviable ecological sector) or non-agricultural sector or both. The shift of land from agricultural sector to unenviable ecological sector would have adverse impact on the agricultural sector. Land transformations within the agricultural sector have important implications depending upon the dynamics of change among the classes. If there is a positive change to the agricultural sector (+ ΔA), and also an increase in the net sown area (+ ΔC), this situation would be in favour of agricultural sector and considered as desirable change.

Even if there is negative net change (- ΔA), but positive change in net sown area (+ ΔC), the dynamics is considered favourable for agricultural sector and assumed as desirable land use dynamics as the cropped area is increasing. But, a decrease in net sown area (- ΔC) by shift of cultivated land towards fallow and culturable waste land have negative impact on agricultural sector. Further, this situation would require larger investments and efforts to reclaim such waste land.

$$\Delta A = \Delta W + \Delta F_c + \Delta F_o + \Delta C$$

The non-agricultural sector consists of land under non-agricultural land uses. This sector is another critical sector of land use change. An increase in land under non-agricultural sector can be in three ways; it may occur at the cost of ecological sector or agricultural sector and even drawing land from both. If the land under enviable ecological sector transformed into non-agricultural sector, this will have adverse effects for the ecology. Thus, better land utilization is assumed to be when non-agricultural sector draws land from unenviable ecological sector. Similarly, increases in non-agricultural sector gaining land from agricultural sector may also be detrimental as this may result in food shortage.

$$\Delta N = \Delta N$$

Results and Discussion

Land Use Dynamics in Ecological Sector

In 2010-11, about 10 per cent area was under the enviable ecological sector and 4 per cent under unenviable ecological sector (barren land) (Table 2). Thus, only 14 per cent of total reporting area is under the total ecological sector. During the last 10 years, there was no appreciable change in enviable, unenviable and also in ecological sector in Bundelkhand region. Similar condition prevailed in the entire state of Uttar Pradesh. The district level analysis reveals that in Chirtakoot district, a decrease (3 percentage points) was recorded in the ecological sector, but land under enviable ecological sector was decreased to 2.76

Bundelkhand Region		
Dynamics of Land Use Change in Different Sectors		
Changes in reported area (ΔR)	Changes in ecological sector (ΔE)	Changes in forest (ΔF_r)
		Changes in permanent pasture land (ΔP)
Changes in agricultural sector (ΔA)	Changes in ecological sector (ΔEE)	Changes in miscellaneous tree crops and groves (ΔM)
		Changes in barren lands (ΔB)
		Changes in cultivable wastelands (ΔW)
		Changes in current fallows (ΔF_c)
		Changes in fallow lands other than current fallows (ΔF_o)
Changes in non-agricultural sector (ΔN)	Changes in non-agricultural sector (ΔNE)	Changes in net sown area (ΔC)
		Changes in non-agricultural sector (ΔN)

Fig. 2

Source: Compiled by Authors

Table 2
Bundelkhand Region: Land Use Dynamics in Ecological Sector during 2000-01 and 2010-11 (Area in Hectares).

District	Land Utilization Reporting Area		Forest		Permanent Pastures and other Grazing Lands		Tree Crops and Groves		Enviably Ecology		Unenviably Ecology		Ecological Sector	
	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11
Banda	453467	438949	5008	5421	400	379	1263	1589	6671	7389	12038	11093	18709	18482
Chitrakoot	325909	338897	89248	59767	59	48	2237	26043	91544	85858	21590	20973	113134	106831
Hamirpur	415948	390865	23520	24473	314	460	745	764	24579	25697	9467	9283	34046	34980
Jalaun	454434	454434	25640	28178	123	152	3120	1633	28883	29963	12688	11298	41571	41261
Jhansi	499393	501327	33638	34400	634	729	623	1030	34895	36159	31794	31545	66689	67704
Lalitpur	509436	509791	76160	76158	3471	2643	1750	698	81381	79499	17701	14053	99082	93552
Mahoba	327429	327429	16213	16213	398	513	242	640	16853	17366	8357	8211	25210	25577
Bundelkhand	2986016	2961692	269427	244610	5399	4924	9980	32397	284806	281931	113635	106456	398441	388387
Uttar Pradesh	24468	24293	1677	1657	70	65	345	354	2092	2076	632	487	2708	2563
			6.85	6.82	0.29	0.27	1.41	1.46	8.55	8.55	2.58	2.00	11.07	10.55

Source: Directorate of Economics and Statistics, Ministry of Agriculture, Government of India.
Figures in bold are percentages.

percentage points while in unenviable ecological sector, the decrease was insignificant. This result signifies that in Chitrakoot district, the land use dynamics is mostly unfavourable in ecological sector. This is because high share (10 percentage points) of forest land was transformed to other sectors; on the other hand, there was 7 percentage points increase in land under miscellaneous tree crops and grooves. In other six districts of Bundelkhand region, the change was not significant (less than 1 percentage point) in ecological sector.

In the years, 2000-01 and 2010-11, the share of enviable and (barren land) unenviable ecological sectors is higher in the Bundelkhand region than the state average. This indicates greater eco-friendly land use distribution in enviable ecological sector in Bundelkhand region rather than its state's average. Similarly, due to higher share of (barren land) unenviable ecological sector in this region, vulnerability is higher than the state of Uttar Pradesh. In the sub-sector of enviable ecology, the share of forest land is high (8.26 per cent) in the region which is higher than state average of 6.82 per cent in 2010-11. The share of barren land of unenviable ecological sector was maximum in Jhansi district (6.29 per cent) followed by Chitrakoot district (6.19 per cent), while Mahoba district has the lowest share (Table 2). The share of the enviable ecological sector is highest in Chitrakoot district (25.33 per cent) followed by Lalitpur district (15.59 per cent), while Banda district has the lowest share (1.68 per cent).

Land Use Dynamics in Agricultural Sector

Despite poor physical conditions, land under agricultural sector is higher in Bundelkhand region as compared to other sectors. However, the region has recorded a declining trend in agricultural land. Table 3 shows a decrease of agricultural land both in Bundelkhand region as well as in the entire state of Uttar Pradesh. In Bundelkhand region,

a marginal decrease of 1.05 percentage points (78.13 per cent in 2010-11 from 79.18 per cent in 2000-01) was recorded in agricultural land. The state as a whole also reported 1.08 percentage points decrease in agricultural land during the same period. This indicates that there are similarities between Bundelkhand and Uttar Pradesh regarding agricultural land use dynamics despite varied physical and human conditions. However, it may be noted that Banda district has recorded an addition of agricultural land (1 percentage point), while in the rest of six districts; there is a reduction in share of agricultural land. Highest decrease of agricultural land was found in Hamirpur district during the study period. Banda district also has highest share of agricultural land (90.63 per cent) while Chitrakoot district (59.39 per cent) had the lowest share of agricultural land (Table 3).

Within agricultural sector, net sown area accounts for the largest share (68.06 per cent) of total reporting area which is almost equal to state average (Table 3). At state level, there is a negative change in the share of net sown area during the study period, while Bundelkhand region has recorded marginal increase in the net sown area during this period. Banda district has reported highest share in net sown area, while Chitrakoot district recorded the lowest as it was in case of agricultural sector as a whole. Lalitpur district, recorded 10 percentage points increase in net sown area followed by 5 percentage points witnessed by Banda district among all the districts of study area.

In comparison with the state of Uttar Pradesh, Bundelkhand's performance is also positive in culturable waste land, current fallows and other fallows. Within agricultural sector, this region reported decrease of land share under culturable waste land, current fallows and other fallows except of net sown area. But in Uttar Pradesh, land has been added in current fallows and deducted from net sown area. These results indicate that in Bundelkhand region, the process of land

Table 3
Bundelkhand Region: Land Use Dynamics in Agricultural and Non-agricultural Sectors during 2000-01 and 2010-11 (Area in Hectares).

District	Culturable Waste Land		Current Fallow		Fallow Lands & other than Current Fallows		Net Area Sown		Agriculture Sector			Area under Non-Agricultural Uses		
	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11	2000-01	2010-11
Banda	12151	11551	36138	22491	16715	13919	339657	349867	404661	397828	30097	31687	30097	31687
	2.68	2.63	7.97	5.12	3.69	3.17	74.90	79.71	89.24	90.63	6.64	7.22	6.64	7.22
Chitrakoot	11724	11116	4325	14487	6694	5345	174067	170656	196810	201267	15965	30799	15965	30799
	3.60	0.33	1.33	4.27	2.05	1.58	53.41	50.36	60.39	59.39	4.90	9.09	4.90	9.09
Hamirpur	5312	4391	16058	22437	4503	3306	324935	292912	350808	323046	31094	32839	31094	32839
	1.28	1.12	3.86	5.74	1.08	0.85	78.12	74.94	84.34	82.65	7.48	8.40	7.48	8.40
Jalaun	3947	2145	22656	22193	7004	6307	344938	343574	378545	374219	34318	38954	34318	38954
	0.87	0.47	4.99	4.88	1.54	1.39	75.90	75.60	83.30	82.35	7.55	8.57	7.55	8.57
Jhansi	15685	15188	38813	44000	7454	6965	329931	323287	391883	389440	40821	44183	40821	44183
	3.14	3.03	7.77	8.78	1.49	1.39	66.07	64.49	78.47	77.68	8.17	8.81	8.17	8.81
Lalitpur	80919	59101	18838	2047	24152	12290	253219	301288	377128	374726	33226	41513	33226	41513
	15.88	11.59	3.70	0.40	4.74	2.41	49.71	59.10	74.03	73.51	6.52	8.14	6.52	8.14
Mahoba	11390	10221	10121	13904	4785	5022	238053	234003	264349	263150	37870	38702	37870	38702
	3.48	3.12	3.09	4.25	1.46	1.53	72.7	71.47	80.73	80.36	11.57	11.82	11.57	11.82
Bundelkhand	141128	103713	146949	141559	71307	53154	2004800	2015587	2364184	2314013	223391	258677	223391	258677
	4.73	3.50	4.92	4.78	2.39	1.79	67.14	68.06	79.18	78.13	7.48	8.73	7.48	8.73
Uttar Pradesh	542	425	1060	1211	648	536	17015	16709	19265	18881	2474	2844	2474	2844
	2.22	1.75	4.33	4.98	2.65	2.21	69.54	68.78	78.74	77.72	10.11	11.71	10.11	11.71

Source: Directorate of Economics and Statistics, Ministry of Agriculture, Government of India.
 Figures in bold are percentages.

utilization is better than the state land use dynamics.

Land use Dynamics in Non-agricultural Sector

There is an increasing trend in agricultural land in Bundelkhand region as well as in Uttar Pradesh but the share of land under non-agricultural sector is higher in the state than the region (Table 3). The district level analysis reveals that Mohoba district reported the highest share of non-agricultural land (11.8 per cent) which is followed by Chitrakoot district which has recorded highest increase in area under non-agricultural land during the study period.

Land use dynamics and its implications

In this section, the study analyses inter-sectoral land transformation and its possible impacts on ecological balance, agricultural development and progress of non-agricultural activities. Table 2 shows a decrease of 2875 hectares and 7179 hectares of land in the enviable and unenviable ecological sector, respectively. Thus, the total decrease in the ecological sector is 10,054 hectares. The decrease of enviable and unenviable ecological land may be attributed to the transformation of land from these sectors to non-agricultural sector. But Bundelkhand region has also recorded decline in total reported area during the study period. If we ignore the decrease of land in reported area, then the shift from enviable and unenviable ecological sector is towards non-agricultural sector. The shifting of land from enviable ecology to non-agricultural use would have adverse ecological effects. This situation also prevails in Chitrakoot and Lalitpur districts. The study highlights that in the districts of Banda, Chitrakoot, Jalaun and Lalitpur, land is shifting from unenviable ecological sector to non-agricultural sector. The land transformation from barren land (unenviable ecology) to non-agricultural land would have no adverse effects on ecology and

this trend is a sign of better land utilization.

The present study reveals that in Bundelkhand region, 49,556 hectares of agricultural land has been transformed to non-agricultural sector drawing land mostly from ecological sector. The district level analysis corroborates that agricultural land is converted to non-agricultural activities in all the districts with an exception of Chitrakoot district. From Fig. 3 it is clear that Hamirpur district reported highest decrease of agricultural land followed by Banda and Jalaun districts. But Chitrakoot district is the exception with increase of agricultural land as well as non-agricultural land (Fig. 3).

If the net change in the agricultural sector is negative, the deducted land from agricultural sector may have shifted to ecological or non-agricultural sector or both. From the data it is observed that share of agricultural workers decreases from 77.9 per cent in 1991 to 69.4 per cent in 2011 in Bundelkhand region (Table 4). As per Census of 2011 data, 69 per cent of main workers and 74 per cent of marginal workers are engaged in agricultural activities whether as cultivators or agricultural labourers (Table 5). This strengthens the argument that although share of agricultural workers is decreasing, agriculture is still the single most important activity in sustaining livelihoods of people. Decreasing trends of land under agriculture and agricultural workers during the study period suggests positive association between share of agricultural land and share of agricultural workers. Thus, conversion of agricultural land to non-agricultural land has adverse impact on agricultural growth and production.

Conclusions

The study concludes that land transformation from agricultural to non-agricultural uses has affected both the ecology and livelihood of population in the study area. During the last 10 years, no significant change in enviable and unenviable ecological sectors

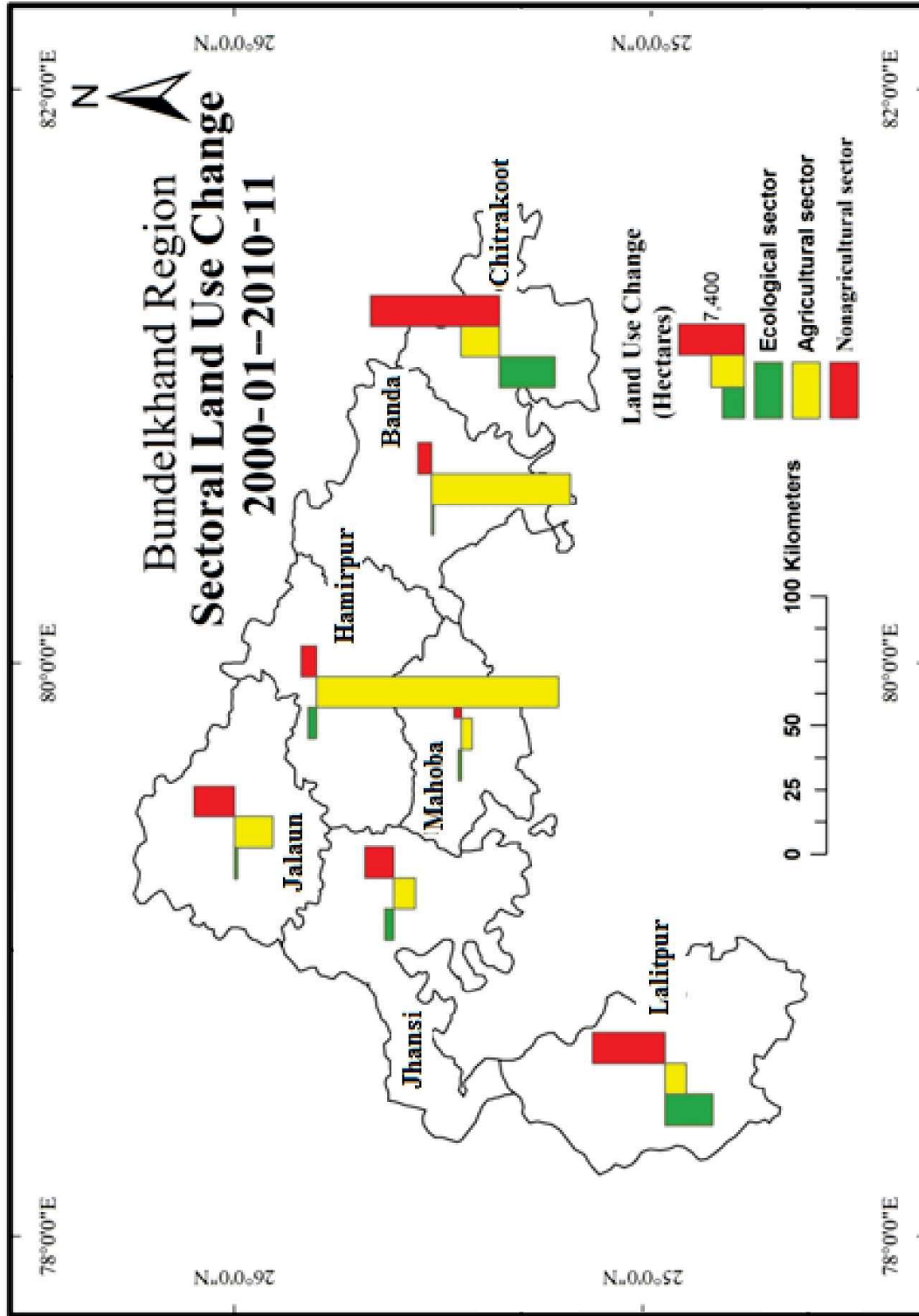


Fig. 3

Source: Compiled by Authors

Table 4
Bundelkhand Region: Share of Main Workers Engaged with Agricultural Activity during 1991-2011
 (Per cent)

District	1991	2001	2011
Banda	85.9	75.0	73.9
Chitrakoot	NA ¹	84.6	77.9
Hamirpur	81.7	72.2	68.7
Jalaun	78.4	69.5	69.6
Jhansi	62.1	55.2	56.5
Lalitpur	81.4	75.5	77.9
Mahoba	NA ²	72.1	68.3
Bundelkhand	77.9	72.1	69.4
Uttar Pradesh	NA³	62.1	56.7

¹On 6 May 1997, Chitrakoot district was carved out from the erstwhile Banda district comprising its Karwi and Mau tehsils. So, in 1991 census data on Chitrakoot district is not available.

²This district was carved out from the erstwhile Hamirpur district on 11 February 1995 by separating the erstwhile Mahoba tehsil from it. So, in 1991 census data on Mahoba district is not available.

³In 1991 Uttar Pradesh was part of Uttar Pradesh. Thus, the data of 1991 census on Uttar Pradesh has been excluded to avoid data violation.

Source: *Census of India, 1991, 2001 & 2011.*

Table 5
Bundelkhand Region: Share of Economically Active People Engaged with Agricultural Activity, 2011

District	Main Workers			Marginal Workers		
	Total Workers	Total Agricultural Labourers & Cultivators	Share of Agricultural Labourers & Cultivators (Per cent)	Total Workers	Total Agricultural Labourers & Cultivators	Share of Agricultural Labourers & Cultivators (Per cent)
Banda	483232	357431	73.97	218457	167782	76.80
Chitrakoot	282614	220300	77.95	111583	90489	81.10
Hamirpur	290375	199530	68.71	153280	112233	73.22
Jalaun	420266	292728	69.65	200498	146920	73.28
Jhansi	560041	316629	56.54	254873	160324	62.90
Lalitpur	357033	278156	77.91	146318	120778	82.54
Mahoba	238712	163121	68.33	110964	81545	73.49
Bundelkhand	2632273	1827895	69.44	1195973	880071	73.59
Uttar Pradesh	44635492	25326330	56.74	21179223	13670781	64.55

Source: Census of India, 2011

has been noticed in Bundelkhand region. During the study period (2000-01 and 2010-11), the shares of enviable and unenviable ecological sectors are found to be higher in the Bundelkhand region than the state average. It indicates fair land use distribution in enviable ecological sector in the study region.

There is no appreciable difference between Bundelkhand region and Uttar Pradesh regarding agricultural land use dynamics. Within agricultural sector, Bundelkhand region reported decrease in the share of land under culturable waste land, current fallows and other fallows except of net sown area, which has marginally increased. At state level, also a negative change in the share of net sown area, during the study period, has been noticed. These results indicate that in Bundelkhand region, despite of the poor physical conditions, there is an increase in net sown area showing poor state of secondary and tertiary sectors.

Despite the inhospitable physical conditions, agriculture is the single most important activity in sustaining livelihoods of people in Bundelkhand region. This is the main reason, due to which the people of Bundelkhand region are suffering from insecurity of livelihood. The situation is getting worse as agricultural land is being transformed to non-agricultural land uses. The share of agricultural workers is also decreasing mainly due to out migration of workers from the study area.

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