

LAND SIZE CLASS CATEGORIES WISE CHANGE IN LAND USE PATTERN IN BIRBHUM DISTRICT – A BLOCK LEVEL ANALYSIS

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Abstract

The main purpose of the present study is to reveal land use pattern change across land size class categories at the block level in Birbhum district during 1995-96 to 2015-16. For achieving the above mentioned purpose, the present study is divided into three parts. The first part deals with introduction. While in second part, the analysis of individual land size class wise land use pattern like total area, net sown area, net cultivable land, culturable waste land, fallow land other than current fallows, current fallows and net sown area is made. Conclusions are made in third part.

Introduction

Land is the important natural resource which supports evolution and development of all types of life on land. Land use is any kind of permanent or cyclic human intervention on the environment to satisfy human needs and the land use capability or land suitability. The concept of land use is related to the use of land for which land is put in a certain region for a given period of time. Land use studies, are important, as they are aimed to explain the occurrence of different use of different areas. They are generally aim of explaining the constant interaction between available land resources on the one hand and human needs and efforts on the other. Land use, thus, is an expression of permanent struggle in which human efforts are applied to the land resources for the satisfaction of human needs. According to Lillesand and Kiefe, "The term land use relates to the human activities associated with specific piece of land features present on the earth surface". Land is a gift given by the nature to the mankind; hence, it is the basic resources of human society. Land use is also related to conservation of land from one major use to another general use (Nanvati, 1951). Shafi (1956) surveyed 12 villages of Eastern Uttar Pradesh which can be regarded as milestone. 'Land use is the surface utilization of all developed and vacant land on a specific point at a given time

and space. This leads one back to the village farm and the farmer to the fields, garden pastures, fallow land and forests and to the isolated farm steam (Freeman T.W. 1968). Vannzetti (1972) says, Land use is the result of combination of natural and cultural factors. In 20th International Geographical Congress held at London (1966), it was suggested that any technique which is adopted for rural land use planning should aim at recording the existing use of land in first instance, followed by mapping of land capability or land potential at the next stage (Shafi,1960). Land use means use of lands for different purposes like agricultural, forests, industrial, residential, recreational etc at a point of time of a place (Sohal, 1979). Land is the basic resource for human society and land use is the surface utilization of all developed and vacant lands on specific point at a given time and space. It is a systematic arrangement of various classes of land on the basis of certain similar characteristics, mainly to identify and understand their fundamental utility-intelligently and effectively in satisfying the needs of human society (Vaidya, 1997). The study of land use pattern is of prime concern to geographers to know the relationship between man and natural environment. Land use is an important aspect of geographical studies and progress of an area can be measured to a certain degree by the way which its land is used and maintained (Rao, 1986). The land use pattern indicates the spatio - temporal sequence of area under different uses. It also indicates that net available land for cultivation which is an important factor since it is the base for agricultural planning (Arsud, 2000). The change in any form of land use is largely related either with the external forces and the pressure built-up within system (Bisht and Kothiyari, 2001). Land use shifts are caused by external and internal drivers and have been influenced by many traditional and modern resource management practices (Campbell et al.2005). Analysing the land use changes and understanding the subsequent trends of change contribute to present complex dynamics of land cover and is important for policy making, planning and implementing of natural resource management (Loannis and Meliadis, 2011, Knorr & et al., 2011, Reddy and Gebreselassie, 2011).

The term land use refers to the utilization of land in a particular area. The type of land, the area having, how much of land being utilized under cultivation, and how much still is not in use for cultivation. With increase in population, the main concern of the geographers, planners, economists etc. is to grow more and more crops and for this, maximum utilization of land is the best possible way to fulfill the basic needs of the people. So each type of should

be classified (Kolar,2000). Whereas, Gregor (1970) has stated that land use of an area is the cumulative outcome of historical events, the interaction of economic forces with the natural environment and the values of society. Despite the significant influence of the natural environment on the original distribution of the use of the geographical areas, subsequent adjustments of land use to ecology and clearly evident.

Statement of the Problem:

After independence, there have been considerable changes in all the parameters of agriculture. With increasing population and the increasing demand of food it is necessary to provide viable solutions. Agriculture has been intensified to a very great extent but this intensification of agriculture brings with it several challenges like soil fertility, low productivity with passing time etc. Cultivable land has become exceptionally fragmented, which is a huge issue for the country as a whole. Small land holdings are unviable and marginal and small farmers are always in debt.

More than 73 % of land belongings in Birbhum belong to small and marginal farmers and the average land size holdings is 0.71 hectares which makes it difficult for application of advanced technology in the farmers' fields. Paddy is the major crop of the district which covers a major portion of the total cropped area. Other crops like wheat, oilseeds, vegetables etc. dominate. Due to high dependence on chemical fertilizers the soil fertility is declining and along with it the production which in turn may affect the income of the farmers. Birbhum already faces the problem of an undulating topography and dryness which adversely affects agriculture. The western parts of Birbhum are more under undulating topography. This district is highly dependent on monsoon for their agriculture, but the monsoon being erratic with seasonal rivers pose hindrance in overall agricultural production. Birbhum is one of the backward districts of West Bengal. The undulating topography and the dryness of the district make it a hindrance towards agriculture, even though the backbone of the economy is agriculture. The backwardness of this district is due to several technological, socio-economic, political, administrative and environmental factors.

Objectives

- I. To study the land use pattern change across land size class categories at the block level from 1995-96 to 2015-16;

- II. To show changes in land use pattern at block level, the data of land use for all the blocks of the district during 1995-1996 and 2015-2016.

Data Base

The data used in this study are completely taken from secondary sources. All of the data has been taken from the Agricultural Census of India authorised by the Government of India. The map of Birbhum was taken from the District Statistical handbook. The information provided regarding the location and topography under the study area section has also been taken from the District Statistical Handbook and the District Human Development Report.

Methodology

For studying the changes in trends and pattern of general land use in Birbhum, the data of land use of the years 1995-96 to 2015-16 from agricultural census has been taken and then graphically represented.

For studying the changes in land use pattern at block level, the data of land use for all the 19 blocks of the district has been taken of the years 1995-1996 and 2015-2016. The change has been calculated by simply subtracting the base year from the current year and then graphically represented.

The changes under land size category wise land use pattern had been studied by collecting the data under various land size class i.e., marginal, small, semi medium, medium, large and all classes of the years 1995-96 and 2015-2016. Then the base year has been subtracted from the current year and graphically represented.

Study Area:

The district of Birbhum lies between $23^{\circ} 32' 30''$ N to $24^{\circ} 35' 00''$ N and $87^{\circ} 05' 25''$ E to $88^{\circ} 01' 40''$ E. Birbhum is the northern most district of Burdwan division. It is located on the west boundary of the state of West Bengal. Birbhum is a part of 'Rahr Bengal'. The area is bounded by the river Ajay in the south and Dumka and Jamtara districts of the state of Jharkhand on the west and north. The district consists of 19 blocks which are BolpurSriniketan, Illambazar, Labhpur, Khoyrasol, Md. Bazar, Nalhathi I, Nalhathi II, Muraroi I, Muraroi II, Rampurhat I, Rampurhat II, Rajnagar, Suri I, Suri II, Sainthia, Dubrajpur, Mayureshwar I, Mayureshwar II, and Nanoor. It shares 5.12 percentage of land area of the state of West Bengal.

The population of Birbhum according to 2011 Census is 3502404 out of which 62% Of the total population consists of Hindus and 37% Muslims. The majority of the population is rural population which consists of about 87.17 % of the total population. This is one of the districts in West Bengal which has a notable ST population of 242484. The sex ratio is 956 females for every 1000 males.

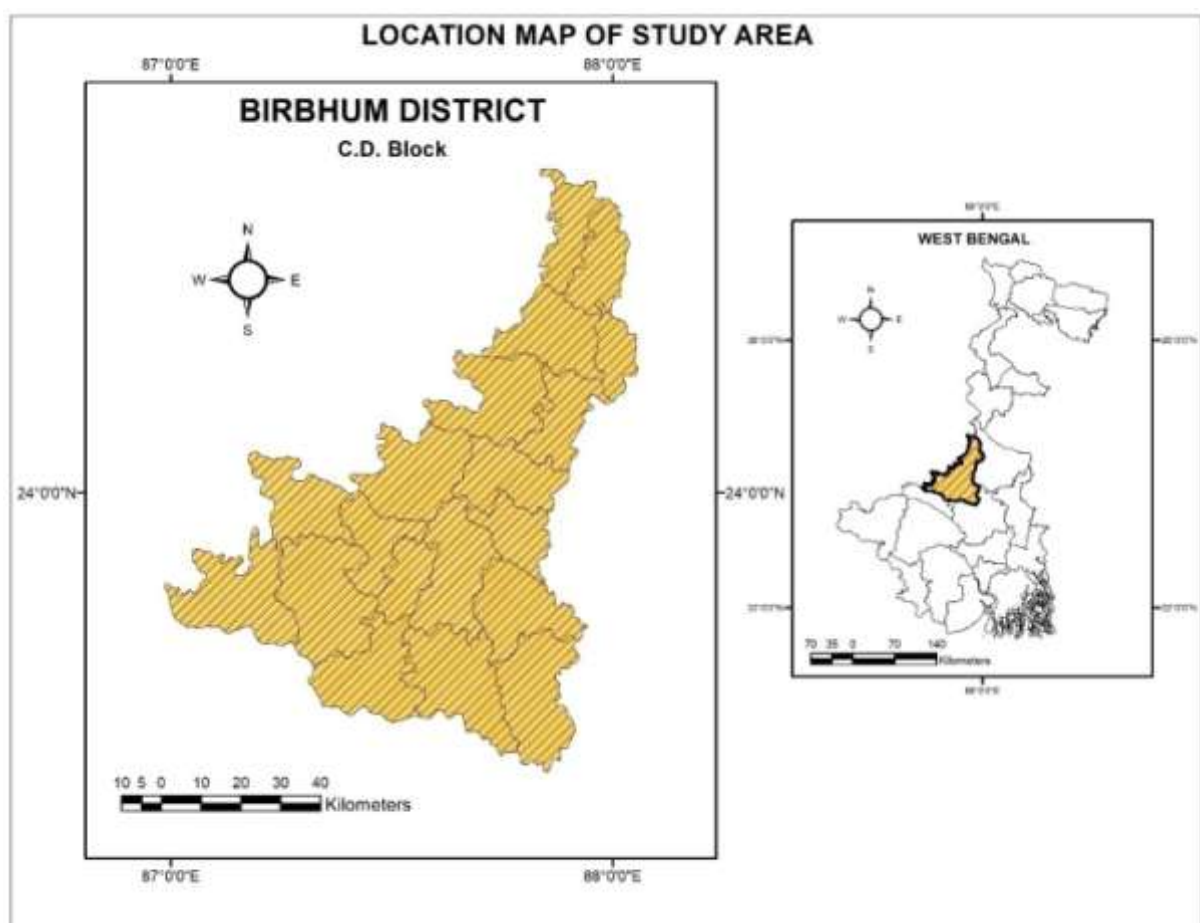


Fig. 1

Results & Discussion:

Total Area (TA)

Total area includes all the cultivated and uncultivated land under an operational holding. It comprises the farm buildings owned by the farmers and also their houses. Total area will consist of the area of a complete geographic unit at a particular point.

Table 1 shows that there is a declining trend in total area from 1995-96 to 2015-16. According to Agricultural Census the total area reduced from 309577 to 303868 hectares. From Figure 2, it is seen that Illambazar, Khoyrasol, Mayureshwar I, Mayureshwar II, Labhpur, Nalhati-II, Rajnagar, Rampurhat I, Rampurhat II, Suri II has positive growth in total area, Nalhati II being the block having the highest growth in total area. Other blocks recorded decrease in twenty years. From Table 4, land size category wise reveals that only under marginal and semi-medium category the total area has increased from 1995-1996 to 2015-2016. It records 111825 hectares in 1995-96 and 127285 hectares under total area in 2015-2016.

Table 1: Trends and Patterns of Land Use in Birbhum District, 1995-96 to 2015-16

Types of Land Use	1995-96	2000-01	2005-06	2010-11	2015-16
Total Area	309577	306431	305214	304558	303868
Net Sown Area	307378	304118	303926	291158	301570
The Area Under Current Fallow	893	1007	329	11307	2034
Net Cultivated Area	308271	305125	304255	302465	303603
Other Uncultivated Land Excluding Fallow Land	360	323	182	383	265
Fallow Land Other Than Current Fallows	152	329	194	431	0
Culturable Waste Land	336	58	92	36	0
Total Uncultivated Land	848	710	469	850	265
Land Not Available For Cultivation	458	596	491	1244	0

Source: Agricultural Census, Government of India

Net Sown Area (NSA)

This represents the total area sown with crops and orchards and area sown more than once in the same year is counted only once. Net Sown Area shows a declining trend overall, there is seen a huge dip in the year 2010-11, this may be due to 303926 hectares of land was

recorded in the year 2005-06 and the lowest was recorded in 2010-11 with 291158 hectares. It again showed a slight increase from 2010-11 to 2015-16. There was an increase in Net Sown area in 1951-71 was because of promising policies in agriculture. In the late 1970's due to the green revolution the yield of crop was increased tremendously and almost led to negligible change in Net Sown Area. From Table 2 and 3, it is seen that among the Net Sown Area, Illambazar, Khoyrasol, Labhpur, Mayureshwar I, Mayureshwar II, Nalhati II, Rajnagar, Rampurhat I, Rampurhat II, Suri II reported positive growth from 1995-96 to 2015-16. Nalhati II (12602 hectares) recorded the highest positive growth. Agricultural Census recorded 308721 hectares under the entire district in 1995-96 and then 303693 hectares in 2015-16, the entire district showed negative growth under Net Sown Area.

Under Land size category wise change marginal (15501 hectares) and semi medium (4307 hectares) has shown positive growth. In 1995-96 the area under marginal land size was recorded 111227 hectares and in 2015-16 the area was recorded 126728 hectares. Under semi-medium category 70699 hectares was recorded in 1995-96 and then it increased to 75006 hectares in 2015-16. The other land size wise categories recorded negative results.

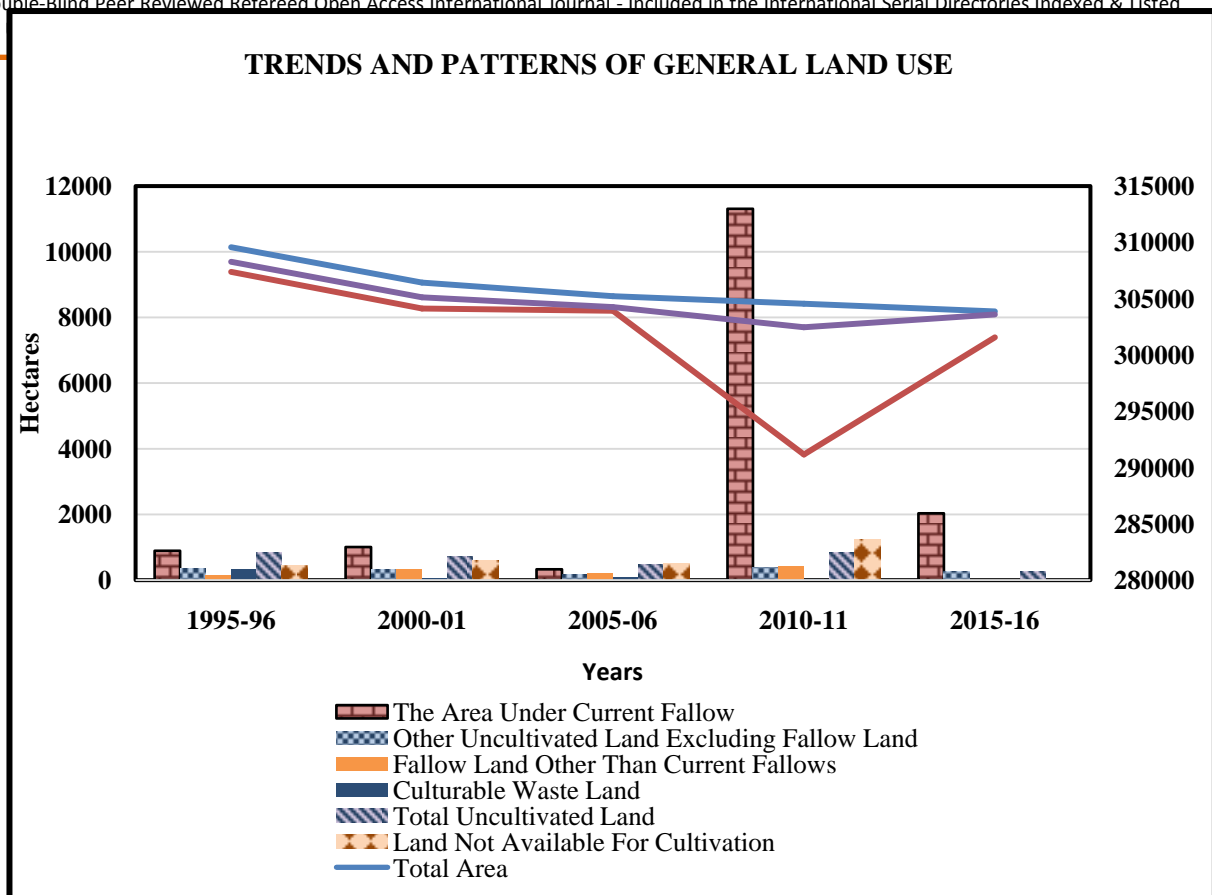


Fig. 2

Area under Current Fallows (AUCF):

This includes all the area, which have been cropped but have not been cultivated under during the reference year. The Table 1 shows that there has been an increase from 1995-96 (893 hectares) to 2001-01 (1007 hectares), again from Fig 2 it is seen that there has been a dip and the lowest negative change has been recorded in 2005-06 (329 hectares). Again it is seen an increase from 2010-11 (11307 hectares) and again a decrease in 2015-16 (2034 hectares).

The district has shown positive change (56.10 hectares), from 893 hectares in 1995-96 to (2034 hectares) in 2015-16. Among all the blocks, Khoyrasol, Muraroi I, Nanoor and Suri I has shown negative change under area under current fallow and the other blocks have recorded positive change. Under land size category wise change marginal, small, semi-medium and all classes have recorded positive change while the other class category of medium and large has shown negative change.

Table 2: Land Use Pattern at Block Level in Birbhum District, 1995-96 (Area in absolute hectares)

LAND USE PATTERN AT BLOCK LEVEL IN BIRBHUM DISTRICT,1995-96										
Sl.No	Blocks	Total Area	Net Sown Area	Area Under Current Fallow	Net Cultivated Area	Other Uncultivated Land Excluding Fallow Land	Fallow Other Than Current Fallow	Culturable Waste Land	Total Uncultivated Land	Land Not Available For Cultivation
1	Bolpur-Sriniketan	31444	31169	140	31309	0	0	116	116	19
2	Dubrajpur	21190	21105	17	21122	27	0	38	65	3
3	Illambazar	16266	15871	113	15984	116	34	25	175	107
4	Khoyrasol	14396	14302	66	14368	8	20	0	28	0
5	Labhpur	19312	19275	2	19277	13	19	3	35	0
6	Mayureshwar-I	14908	14895	8	14903	0	5	0	5	0
7	Mayureshwar-II	15276	15252	8	15260	0	0	0	0	16
8	Md. Bazar	15934	15805	45	15850	0	18	50	68	16
9	Muraroi-I	15331	15052	73	15125	34	50	65	149	57
10	Muraroi-II	13986	13911	6	13917	2	0	0	2	67
11	Nalhati-I	16700	16533	90	16623	31	0	16	47	30
12	Nalhati-II	6704	6652	0	6652	48	0	0	48	4
13	Nanoor	25170	24893	265	25158	0	0	0	0	12
14	Rajnagar	9547	9544	3	9547	0	0	0	0	0
15	Rampurhat-I	14893	14881	4	14885	5	0	0	5	3
16	Rampurhat-II	13875	13866	2	13868	7	0	0	7	0
17	Sainthia	23243	23178	14	23192	28	0	19	47	4
18	Suri-I	10865	10669	36	10705	36	4	1	41	119
19	Suri-II	10537	10525	1	10526	5	2	3	10	1
	District	309577	307378	893	308271	360	152	336	848	458

Source: Agricultural Census, Government of India, 1995-96

Table 3: Land use Pattern at Block Level in Birbhum District, 2015-16 (Area in absolute hectares)

LAND USE PATTERN AT BLOCK LEVEL IN BIRBHUM DISTRICT,2015-16										
Sl.No	Blocks	Total Area	Net Sown Area	Area Under Current Fallow	Net Cultivated Area	Other Uncultivated Land Excluding Fallow Land	Fallow Other than Current Fallow	Culturable waste Land	Total Uncultivated Land	Land Not Available for Cultivation
1	Bolpur-Sriniketan	20708	20520	180	20700	8	0	0	8	0
2	Dubrajpur	19759	19550	201	19750	9	0	0	9	0
3	Illambazar	17205	17005	190	17195	10	0	0	10	0
4	Khoyrasol	14945	14885	60	14945	0	0	0	0	0
5	Labhpur	20570	20417	145	20562	7	0	0	7	0
6	Mayureshwar-I	18281	18187	89	18277	4	0	0	4	0
7	Mayureshwar-II	16472	16417	50	16467	5	0	0	5	0
8	Md. Bazar	13918	13867	51	13918	0	0	0	0	0
9	Muraroi-I	11294	11287	7	11294	0	0	0	0	0
10	Muraroi-II	11851	11776	67	11843	8	0	0	8	0
11	Nalhati-I	14231	14119	112	14231	0	0	0	0	0
12	Nalhati-II	12141	12062	79	12141	0	0	0	0	0
13	Nanoor	24066	23877	180	24058	8	0	0	8	0
14	Rajnagar	12353	12064	112	12175	178	0	0	178	0
15	Rampurhat-I	15934	15785	143	15927	6	0	0	6	0
16	Rampurhat-II	14630	14604	26	14630	0	0	0	0	0
17	Sainthia	22238	21961	267	22228	10	0	0	10	0
18	Suri-I	10604	10562	33	10595	8	0	0	8	0
19	Suri-II	12670	12624	42	12666	4	0	0	4	0
	District	303868	301570	2034	303603	265	0	0	265	0

Source: Agricultural Census, Government of India, 2015-16

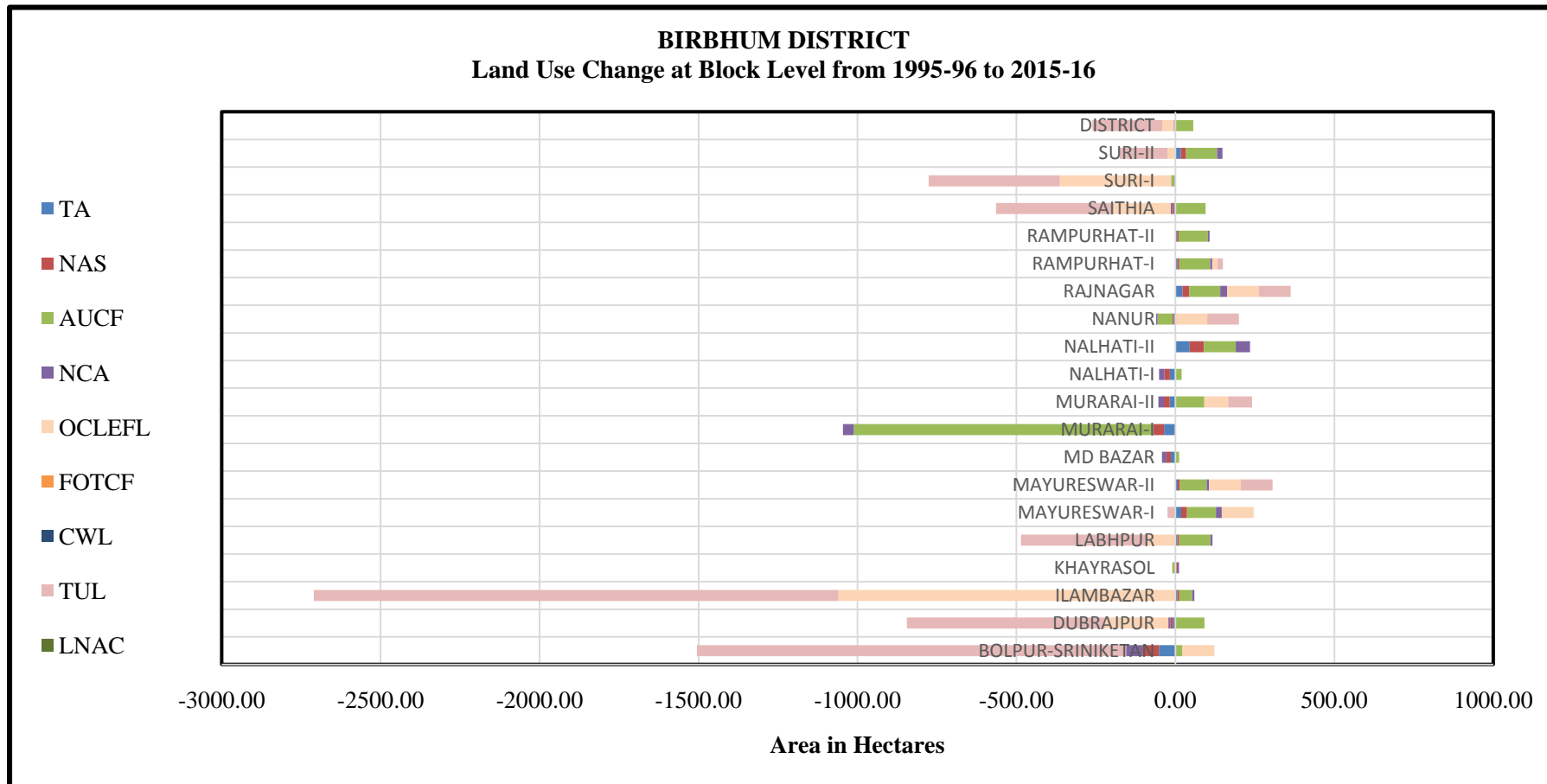


Figure: 3

Table 4: Land Size Category Wise Land Use Pattern in Birbhum District, 1995-96 and 2015-16

LAND USE BY SIZE CLASSES 1995-96									
Land size class (Ha)	Total Area	Net Sown Area	Area Under Current Fallow	Net Cultivated Area	Other Uncultivated Land Excluding Fallow Land	Fallow Other Than Current Fallow	Culturable Waste Land	Total Uncultivated Land	Land Not Available for Cultivation
Marginal	111825	111227	207	111434	96	69	122	287	104
Small	106153	105428	431	105859	90	42	92	224	70
Semi-medium	71170	70699	148	70847	131	30	51	212	111
Medium	19070	18766	103	18869	43	11	71	125	76
Large	1359	1258	4	1262	0	0	0	0	97
All Classes	309577	307378	893	308271	360	152	336	848	458
LAND USE BY SIZE CLASSES 2015-16									
Land size class (Ha)	Total Area	Net Sown Area	Area Under Current Fallow	Net Cultivated Area	Other Uncultivated Land Excluding Fallow Land	Fallow Other Than Current Fallow	Culturable Waste Land	Total Uncultivated Land	Land Not Available for Cultivation
Marginal	127285	126728	553	127281	4	0	0	4	0
Small	95107	93878	1230	95107	0	0	0	0	0
Semi-medium	75256	75006	250	75256	0	0	0	0	0
Medium	5679	5659	1	5660	19	0	0	19	0
Large	540	299	0	299	241	0	0	241	0
All Classes	303868	301570	2034	303603	265	0	0	265	0

Source: Agricultural Census, Government of India, 1995-96 and 2015-16

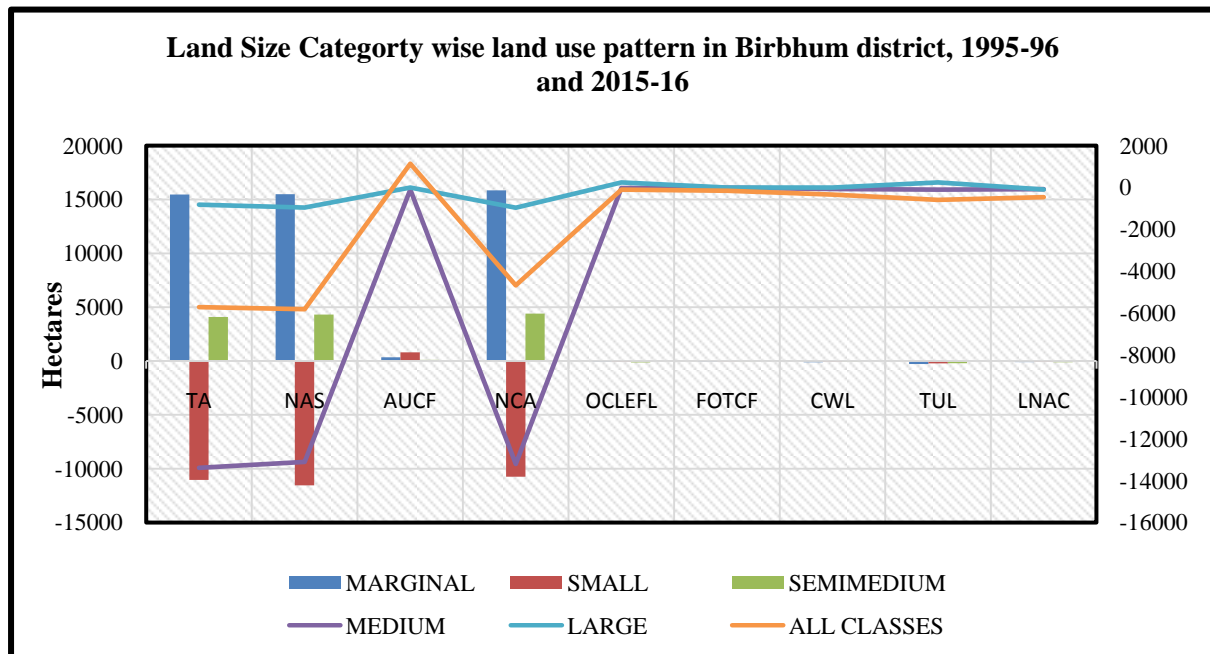


Figure: 4

Net Cultivated Area (NCA)

Net cultivated area refers to the actual cultivable area in an area. It includes net sown area under current fallows with reference year. From figure 3 it is evident that there has been a declining trend in net cultivated area in Birbhum district over twenty years.

The net cultivated area in the entire district has undergone negative change from 1995-96 to 2015-16. Out of 19 blocks, only Illambazar, Khoyrasol, Labhpur, Mayureshwar I, Mayureshwar II, Nalhati II, Rajnagar, Rampurhat I, Rampurhat II, Suri I has shown positive changes with Nalhati II showing the highest positive change from 6652 hectares to 12141 hectares in 2015-16, and the other blocks recorded negative. Under land size category wise change, the only positive changes are seen under marginal (15847 hectares) and semi-medium (4409 hectares) categories.

Other Uncultivated Land Excluding Fallow Land (OULEFL)

It includes two types of land category:

Permanent pastures and other grazing lands: this includes all grazing lands whether its permanent pastures or meadows or not. Village common grazing lands would be excluded in this category.

Land under miscellaneous tree crops: This includes all kind of cultivable land which is out to use for some other cultivation but not sectored under net sown area. Land put under miscellaneous trees, bamboo bushes and other groves for fuel which are not under "Orchards".

From Table 1 and Figure 2, it is seen that the area under this category had been declining steadily from 1995- 96 (360 hectares) to 2005-06 (182 hectares), then there has been recorded a slight increase to (383 hectares) in 2010-11 and then again it declines to (265 hectares) in 2015-16. From table 2 and 3 it has been seen that BolpurSriniketan, Mayureshwar I, Mayureshwar II, Muraroi II, Nanoor, Rampurhat I and Rajnagar, these seven blocks out of nineteen has shown positive change and other blocks recorded negative growth.

From Table 4 it has been recorded that only the large category has shown positive change and all the others negative change even under all classes the change is negative.

Fallow other than Current Fallow (FLOTCF)

This includes all the land, which are taken are taken up for cultivation but are currently out of cultivation for a period of not less than five years and more. The reason for keeping such land is likely to be poverty of the cultivators, inadequacy of water etc. It is also seen that the district as a whole has a negative change. The only blocks show either no change in the blocks or negative change from 1995-96 to 2015-16. From table 4, it has been recorded negative growths under all of the land size categories and no change under large class category. It has been also seen that from 1995-96 (152 hectares) has decreases to (0 hectares) in 2015-16 under this category.

Culturable Waste Land

This includes land available for cultivation, whether taken up or not taken up for cultivation once, but not cultivated during the last five years or more in succession including the current year for some reason or the other. Such land may be either fallow or covered with shrubs and

jungles which are not put to any use. They may be accessible or inaccessible and may lie in isolated blocks or within cultivated holdings.

From figure 4, it shows a steady decline in CWL, from 336 hectares in 1995-96 to 0 in 2015-16. There has been no growth at all in the twenty years.

Total Uncultivated Land (TUL)

It is the area arrived at by deducting the total cultivable area from the total reported area. From table 4, it is found that there has been an overall declining pattern under total uncultivated area, from 848 hectares in 1995-96 to 265 hectares in 2015-16. Mayureshwar II, Muraroi II, Nanoor, Rajnagar, and Rampurhat recorded positive growth and all the other blocks have shown negative growth. The district in all has recorded negative growth (table 2 & 3). According to land size class, only large land size class has shown positive change and the other land size classes have recorded negative change.

Land not available for Cultivation (LNAC):

Forest: This includes all land classified either as forest under any legal enactment, or administered as forest, whether State-owned or private, and whether wooded or maintained as potential forest land. The area of crops rose in the forest and grazing lands or areas open for grazing within the forests remain included under the "forest area".

Area under non-agricultural use: This includes all land occupied by buildings, roads and railways or under water, e.g. rivers and canals, and other land put to uses other than agriculture.

Under this category there is inclination from 1995-96 (458 hectares) to 2005-06 (491 hectares) and again then it shows a rise in 2010-11 to 1244 hectares, but then it showed rapid decline to 0 hectares in 2015-16. Table 4 shows absolutely no growth under this category in none of the blocks. Under land size class wise category i.e. from table 4 and figure 4 it shows negative change in all of the land size class.

Conclusion:

The land utilization activities depend on various factors like topography, climate, physiological conditions, climate etc. The study showed that the land utilisation activities on various land size classes are highly concentrated only on the marginal, small and semi-medium. The large class size land use has decreased from agricultural activities, though already it was very less but whatever activity had been taking place that too has drastically gone down during the past two decades.

Changes have been occurred in all land size class categories. Under total area positive growth have ensued in marginal and semi-medium land size class categories and negative growth found in all remaining three land size class categories during the study period. Marginal and semi-medium land size class categories showed positive growth and other class showed negative growth. Apart from that all other land use pattern showed negative growth in different land size class categories in Birbhum district during 1995-96 to 2015-16.

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