

Spatio-Temporal Variation of Land Use Pattern in West Bengal

Sakil Ansari¹ & Shamsul Haque Siddiqui²

¹ Research Scholar

² Professor

Department of geography, AMU, Aligarh.

Abstract: Land use refers to the utilization of land by man for specific activities to fulfil their needs over a given time scale. The study regarding land use pattern is of prime concern as it involves the concepts of optimizing the land use potential, land evaluation, and land use planning. This study examines the changes in land use both spatially and temporally between the periods of 2000-01 to 2014-15 in West Bengal. Data are obtained from existing secondary sources for the period of 2000-01 and 2014-15. Arc GIS is used to draw pie charts to show the regional variation of the utilization of different categories of land, and simple statistical methods are used for displaying the changes therein. It has been observed that the total reporting area of West Bengal has decreased by 3600 hectares from 2000-01 to 2014-15. All the nine categories of land use experience negative growth in terms of area cover except Area under non-agricultural use, which shows positive growth (27486 hectares increased). Thus, it can be concluded that a shift of land use from agricultural towards non-agricultural uses has been observed in West Bengal.

Keywords: Land Use Pattern, Agricultural Planning, Compound Growth Rate (CGR), Land Utilization.

Introduction:

Land is a primary resource of human society which assists the evolution and development of human, social, economic, and cultural progress. Land use refers to the utilization of land by man for specific activities to fulfil their needs over a given time scale. It is a dynamic concept as the degree of changes in a particular type of land use category leads to the variation to other categories of land utilization. Land utilization denotes the use made of the land by man, as surveyed and mapped in a series of recognized categories. The primary uses of land are for crops, forest, pasture, mining, transportation, gardening, residential, recreational, industrial, commercial and uncultivable waste, barren and fallow land, etc. (Mandal, 1982). According to Singh and Dhillon (1984); "Land use in an area is the cumulative outcome of historical events, the interaction of economic forces with the natural environment, and the values of society." Thus, land use analysis is a very significant aspect of studies in agricultural geography. The aspect of land use analysis is represented in the land-use maps, which are prepared with the help of land use survey. Land use maps are recognized as necessary tools to prepare land capability and land classification maps.

The spatio-temporal sequence of land use pattern indicates the area under different land use categories. Any changes in land use are caused mainly by urban expansion, industrialization, and infrastructural development. The study of land use pattern is of prime concern as it involves the concepts of optimizing the land use potential, land evaluation, and land use planning. Changes in the utilization of land

have been occurring since the beginning of human civilization. But in recent years this phenomenon gets the momentum, particularly in developing countries like India. It leads to the crucial issue for the researcher to do planning for better utilization. Hence, a study on the spatio-temporal variation of land use pattern in the state of West Bengal is an essential academic undertaking.

Objectives:

The main objectives of the present study are-

1. To examine the degree of changes of land use pattern in West Bengal from the period 2000-01 to 2014-15.
2. To calculate the rate of growth of the area in different land use categories in West Bengal.
3. To point out the principal factors affecting the variation in the share of area under different land use classes.

Study Area:

The state of West Bengal is located in the eastern part of India lying between 21° 25' 24" North to 27°13' 15" North latitudes and 85°48' 20" East to 89°53' 04" East longitudes. It spreads over an area of 88,752 sq. Km. (account 2.7 per cent land of the country). The state is bounded by Nepal and Bhutan in the north, the state of Bihar and Jharkhand in the west and Bay of Bengal in the south. In the east, it is bordered by Assam and Bangladesh. According to 2011 census, West Bengal is the fourth-most populous state of

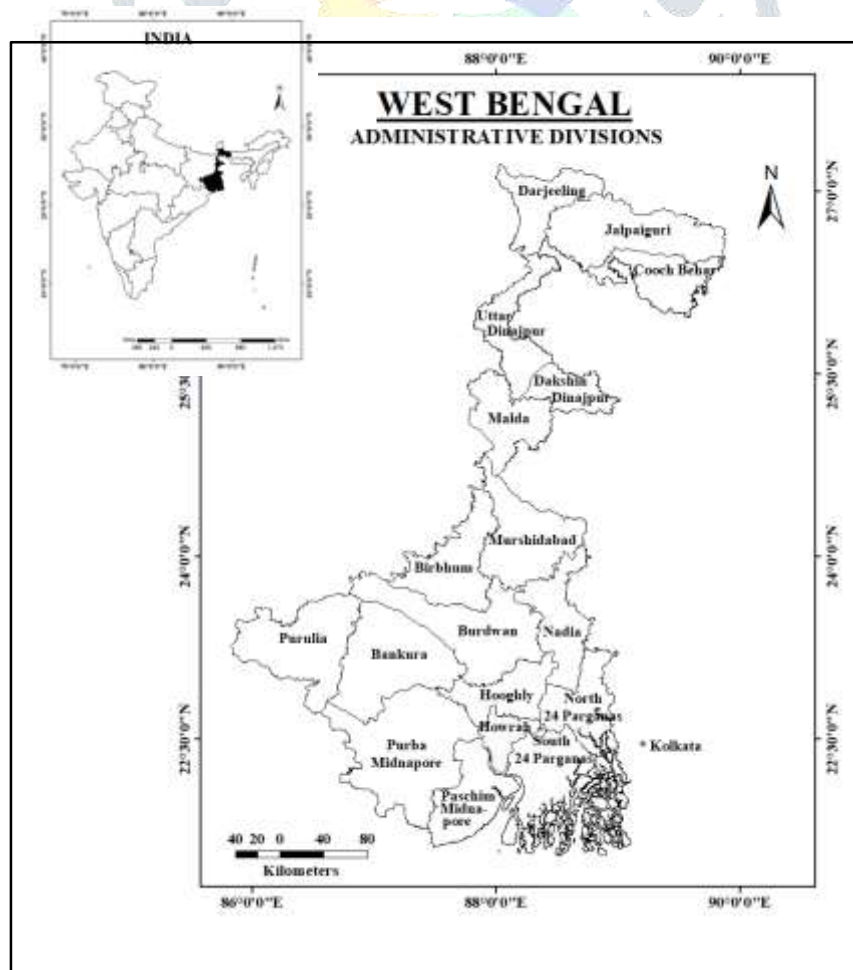


Fig 1- Locational Map

India with a population of 91,276115 persons, out of which the rural population accounts for 62,183113 persons, and the urban population is 29,093002 persons. The state ranks second among the states in terms of population density, which is 1029 persons per sq. Km (Census 2011). There are nineteen districts in West Bengal namely, Darjeeling, Jalpaiguri, Cooch Behar, Uttar Dinajpur, Dakshin Dinajpur, Malda, Murshidabad, Birbhum, Burdwan, Nadia, North 24-Parganas, South 24-Parganas, Hooghly, Bankura, Purulia, Purba Midnapore, Paschim Midnapore, Howrah, and Kolkata. This region experiences a tropical Savanna climate in the southern portions while the northern part enjoys the humid subtropical type of environment.

Database & Methodology:

The study is based on the secondary sources of data collected from Statistical Abstract 2015, published by the Bureau of Applied Economics and Statistics, Government of West Bengal for the year 2000-01 and 2014-15. Arc GIS is used to draw pie charts to show the regional variation of the utilization of different categories of land, and simple statistical methods are used for displaying the changes therein. To enhance the study with more accurate geographical identity, Annual Compound Growth Rate (CGR) technique has been used to show the growth rate between the data of 2000-01 and 2014-15 in the study area. CGR has been worked out using the following formula-

$$CGR = (E_v/I_v)^{1/t} - 1$$

Where, CGR= Compound Growth Rate per annum

E_v = End value

I_v = Initial Value

t = Number of Years

Result & Discussion

Level of changes in Land Use Pattern:

The land use pattern in the study area is shown by the area under different land use categories and their relative percentage to the total reporting area in West Bengal in general and districts in particular during the agricultural year 2000-01 and 2014-15. The land use data are classified into five major categories, and these five categories are further sub-classified into standard nine-fold classes (See annexure-2). The growth rate of all the land use categories has been calculated by applying Compound Growth Rate (CGR) per annum.

1. Area Under Forest:

All the lands that are classified under any legal enactment owned by either the state or private, whether wooded or maintained as potential are defined as forest area. The forest area in West Bengal is

limited and concentrates regionally. Of the total reporting area, 1190.44 thousand hectares area (13.70 per cent) was under forest in 2000-01, which is decreased to 1173.67 thousand hectares (13.52 per cent) in 2014-15. The Compound Growth Rate per annum in the Area under Forest is -0.10. The increasing pressure of population and conversion of forest land into agricultural land and settlement purposes are the leading cause for the decreases in the area under forest category. The district-wise area under forest shows that the highest percentage of forest area was found in South 24 Parganas (44.12 per cent) in 2000-01. It was followed by Darjeeling (38.28 per cent), Jalpaiguri (28.75 per cent), and Bankura (21.56 per cent). In 2014-15, again the highest percentage of forest area was noticed in South 24 Parganas (44.93 per cent) followed by Darjeeling (38.28 per cent), Jalpaiguri (28.75), and Bankura (21.65 per cent). The district of Howrah and North 24 Parganas recorded nil in terms of forest area coverage in both the time periods. The highest positive growth in forest area has found in Cooch Behar (2.18) whereas, the highest negative growth has seen in Burdwan (-2.17) during the period 2000-01 to 2014-15.

2. Area not Available for Cultivation:

This category includes-

- i. Land under non-agricultural use
- ii. Barren and uncultivable land

i. Land under Non-agricultural Use:

The area under non-agricultural use includes all land covered by buildings, roads and railways, under water, e.g., rivers, ponds, and canals, and land put to uses other than agriculture. A total of 274.86 thousand hectares of area under non-agricultural use was increased in 2014-15, as compared to 2000-01 in West Bengal with the rate of 1.16 CGR per annum. A trend of positive growth has also been noticed in all the districts during the study period except Malda, Jalpaiguri, and Darjeeling. The highest positive growth in land under non-agricultural use has been experienced by Purulia (2.16) followed by Bankura (2.09), Hooghly (1.96), Cooch Behar (1.81), and Burdwan (1.79). The leading reasons for the positive growth of this category are the conversion of agricultural land, urbanization, expansion of settlement, the rapid growth of population, etc.

ii. Barren & Uncultivable Land:

Barren and uncultivable lands are those lands which are occupied by mountains, desert, etc. In simple word, land that cannot be brought under cultivation due to an expensive cost is defined as barren and uncultivable land. This land may be within cultivated holdings or in separate blocks. The Barren and uncultivable land was 26.86 thousand hectares in 2000-01, which is decreased to 10.88 thousand hectares in 2014-15 in the state. The rate in which it has been reduced is -6.25 annually. It is witnessed from that the area under Barren and uncultivable land was nil in North 24 Parganas and Malda during 2000-01. Again in 2014-15, it was nil in Howrah, Malda, and Cooch Behar. Most of the districts show negative growth in this category.

3. Other Uncultivable Land:

This category is consisting of three types of land use classes-

- i. Pastures and grazing land
- ii. Misc. tree crops & groves
- iii. Cultivable waste land

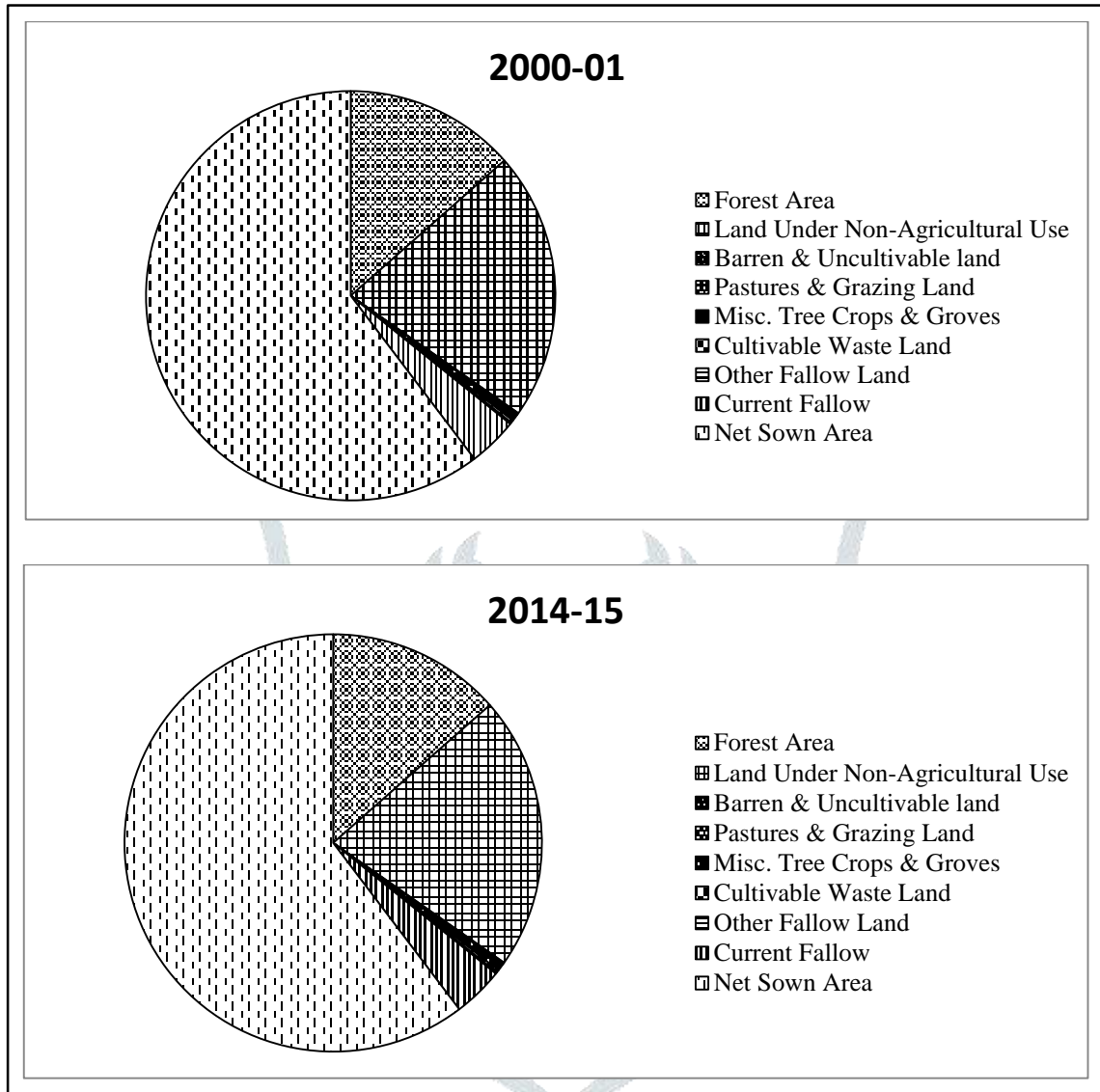


Fig-2: Land Use Pattern in West Bengal in 2000-01 and 2014-15

i. Pastures and Grazing Land:

All the grazing land, whether permanent pastures or not, are included in this category. This land includes the village common grazing land. In West Bengal, the area under Pastures and grazing land was 4.28 thousand hectares in 2000-01, and in 2014-15 it is shrunk to 2.37 thousand hectares. The growth rate of this category in the state is -4.13. Among the districts, the highest positive and negative growth rate has been found in South 24 Parganas (14.91) and Birbhum (-12.01), respectively.

ii. Misc. Tree Crops & Groves:

All the cultivable lands that are not included in the net sown area but has some agricultural use such as land under capturing trees, bamboo bushes, thatching grasses, groves for fuel, etc. which are not included under orchards are inserted in land under miscellaneous tree crops and groves. The area under Misc. tree crops and groves have been decreased from 57.05 thousand hectares to 49.46 thousand hectares during 2000-01 to 2014-15 in the state with a negative growth rate of -1.01 CGR per annum. The highest percentage of the area of this category during 2000-01 was noticed in Cooch Behar (1.84 per cent), while the lowest was in Bankura (0.08 per cent). In 2014-15, Cooch Behar again ranked top in area coverage (1.96 per cent) of Misc. tree crops & groves, while Burdwan has the lowest percentage of area under Misc. tree crops & groves (0.13 per cent). The highest positive growth under this category is registered by Bankura (6.76) followed by Dakshin Dinajpur (5.33) and Burdwan (2.74). On the other hand, the highest negative growth is shown by Nadia (-4.33) followed by Purba Midnapore (-4.20) and Hooghly (-3.70).

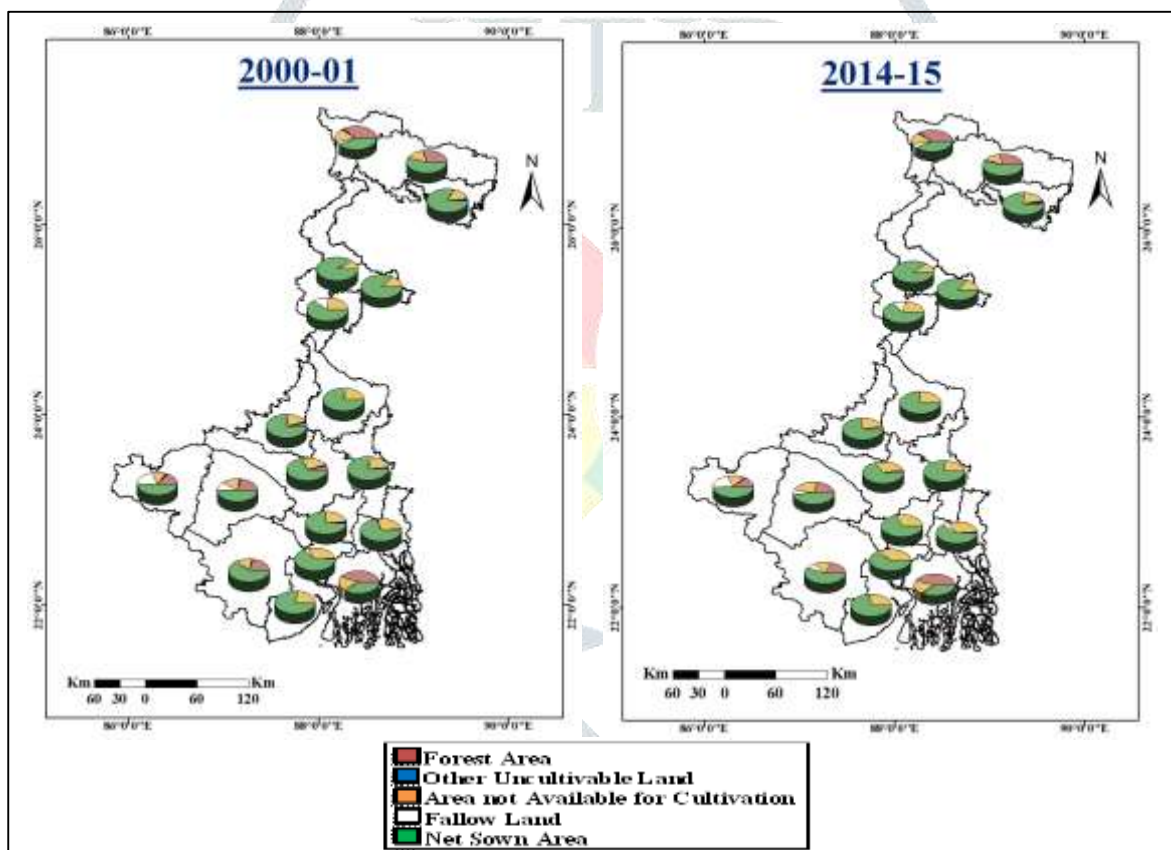


Fig-3: District-wise Land Use pattern changes in West Bengal (2000-01 to 2014-15)

iii. Cultivable Waste Land:

Land that is available for cultivation but not cultivated since the last five years or more in succession, whether cultivated once or not are included under cultivable waste land. Such land may be accessible or inaccessible and may be covered by shrubs and jungles that are put to no use at all. A dramatic change was noticed in cultivated waste land during the study period. It was 37.14 thousand hectares in 2000-01 and was reduced to 16.94 thousand hectares during 2014-15 at the rate of -5.45 per annum. This considerable change was due to the land attributed to several uses in the sectors of industries and housing. The percentage of area

under cultivated waste land was highest in Burdwan (1.08 per cent) in 2000-01, while in 2014-15, the highest percentage of area under cultivated waste land has been noticed in Purulia (0.68 per cent). All the districts in West Bengal except Dakshin Dinajpur show negative growth in this particular category during the study period.

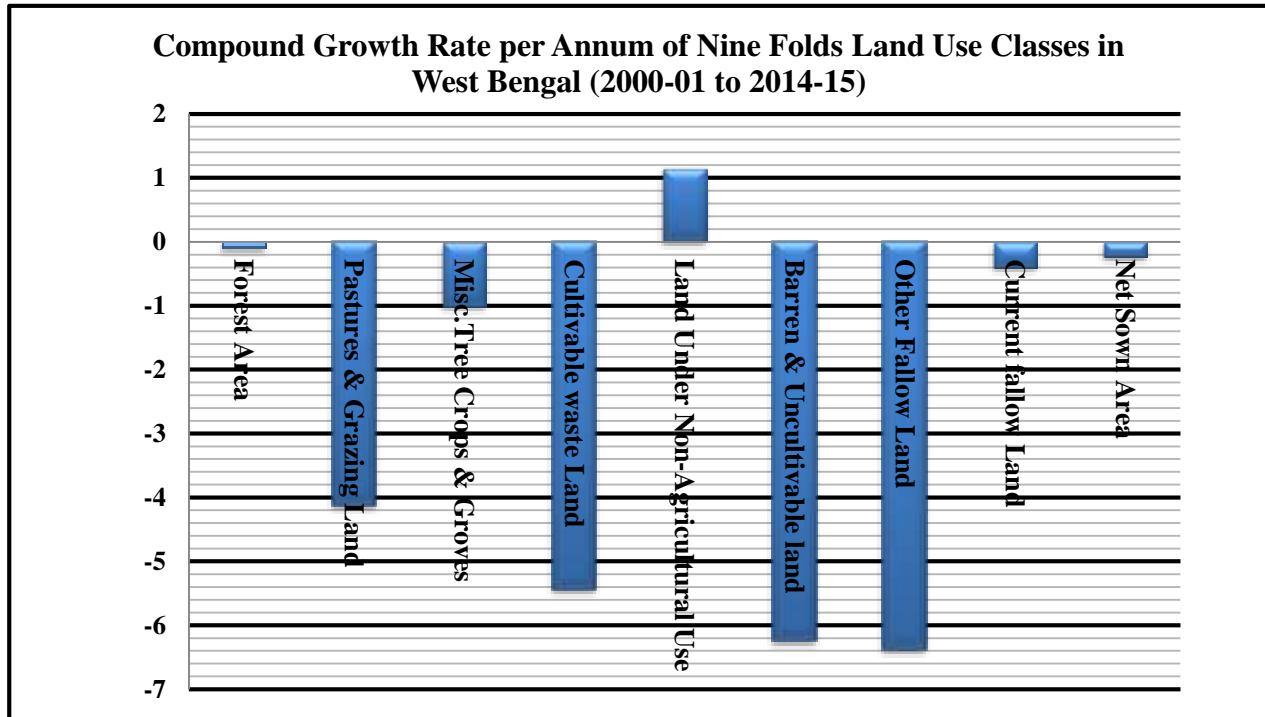


Fig-

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4. Fallow Land:

Fallow land means the land that is not currently cultivating at the time of reporting but was under cultivation in the past. It is essential to mention that fallow land includes only those lands which are temporarily not under cultivation for a period not more than five years in succession. This category consists of-

- i. Other fallow land
- ii. Current fallow land

i. Other Fallow Land:

Other fallow land means the land, which was cultivated once but is temporarily out of cultivation for not less than one year and not more than five years in succession. West Bengal recorded a decrease in area under other fallow land from 28.84 thousand hectares to 11.46 thousand hectares during the study period. Other fallow land has decreased at the rate of -6.38 CGR annually. Darjeeling (1.23 per cent in 2000-01 & 0.81 per cent in 2014-15) recorded the maximum percentage of area under this category in both the years. All the districts show the declining trends during the study periods except South 24 Parganas, Nadia, Uttar Dinajpur, and Dakshin Dinajpur.

ii. Current Fallow:

Current fallow land is that fallow land which represents the cropped area in any region but left unsown or fallow during the current year due to various reasons such as regaining fertility, restoring moisture, economic reasons, etc. The total area under current fallow was 358.36 thousand hectares in 2000-01 in West Bengal and has decreased to 338.72 thousand hectares in 2014-15. Purulia was the district which ranks top in terms of percentage of area under current fallow during 2000-01. It was followed by Malda (15.68 per cent) and Bankura (9.03 per cent). In 2014-15, again, Purulia (18.45 per cent) ranked top, followed by Malda (13.48 per cent) and Paschim Midnapore (7.34 per cent). It is evident from fig-5 that the

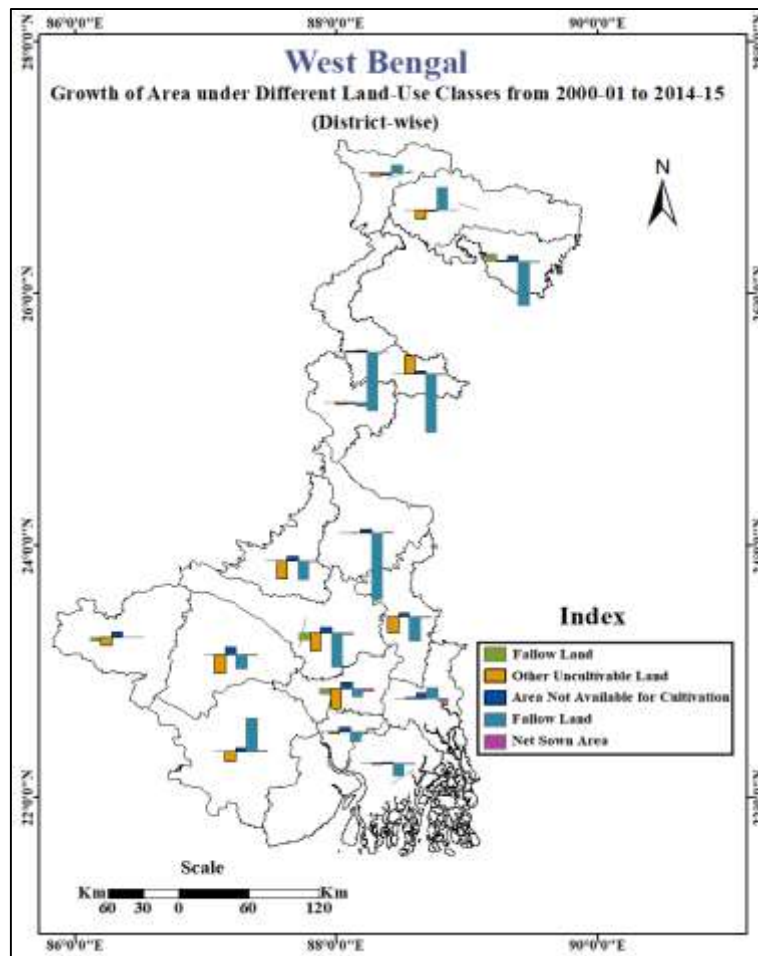


Fig-5

maximum and minimum growth in the area under current fallow has been recorded by Paschim Midnapore (12.09) and Dakshin Dinajpur (-20.50).

5. Net Sown Area:

The extent of cultivated land in any region is represented by Net sown area, and thus, it is of vital importance in the studies of agricultural geography. This category denotes the total cropped area sown with crops and orchards during the agricultural year. There are many areas which are sown more than once in the same year but counted only once. The net sown area was 5417.38 thousand hectares in 2000-01. But in 2014-15, the total area under this category has decreased to 5238.39 thousand hectares. A total of 178.99 thousand hectares area of land has been reduced from 2000-01 to 2014-15 at the rate of -0.24 CGR per annum (Fig-4). In the year 2000-01, Uttar Dinajpur (87.50 per cent) recorded the maximum percentage

under net sown area, followed by Dakshin Dinajpur (85.83 per cent), Cooch Behar (79.94 per cent), Purba Midnapore (76.84 per cent), and Nadia (76.53 per cent) while the lowest percentage of area was recorded by South 24 Parganas (39.16 per cent). The highest and lowest concentration of area under this category was recorded in Uttar Dinajpur (88.22 per cent) and South 24 Parganas (38.15 per cent) during 2014-15. All the districts of West Bengal, excluding Paschim Midnapore, Murshidabad, Uttar Dinajpur, Malda, and Jalpaiguri have experienced negative growth in the net sown area during the study period.

Conclusion:

The land use pattern of any region gives a rough view of how the land is used in different segments. The changes in the land use pattern are taken place due to the interaction of physical and socio-economic factors. West Bengal witnessed negative growth of area under all the nine categories of land use except area under non-agricultural use. There is a continuous increase in the share of area under non-agricultural use during the study periods. The similar picture is almost prevalent in the districts as well. Throughout the study period, it has been noticed that the districts surrounding Kolkata recorded relatively lower share of area under net sown. In a broad sense, land use pattern is divided into two categories, i.e., Agricultural land uses (Including net sown area, current fallow, other fallow land, cultivable waste land, pastures & grazing land, and Misc. tree crops and groves) and Non-agricultural uses. Thus if we look deep into this study, it is evident that a shift of land use from agricultural towards non-agricultural uses has been observed in West Bengal during the study period.

Annexure-1. Changes in Land Use Pattern in West Bengal (2000-01 to 2014-15)

(Area in Thousand Hectares)

S. No.	Land Use Categories	Selected Years		Volume of Change	CGR
		2000-01	2014-15		
1	Reporting Area	8687.71	8684.11	3.60	-
2	Forest Area	1190.44 (13.70)	1173.67 (13.52)	-16.77 (-0.18)	-0.10
3	Land Under Non-Agricultural Use	1567.36 (18.04)	1842.22 (21.21)	274.86 (3.17)	1.16
4	Barren & Uncultivable land	26.86 (0.31)	10.88 (0.12)	-15.98 (-0.19)	-6.25
5	Pastures & Grazing Land	4.28 (0.05)	2.37 (0.03)	-1.91 (-0.02)	-4.13
6	Misc. Tree Crops & Groves	57.05 (0.66)	49.46 (0.57)	-7.59 (-0.09)	-1.01
7	Cultivable Waste Land	37.14 (0.43)	16.94 (0.19)	-20.20 (-0.24)	-5.45
8	Other Fallow Land	28.84 (0.33)	11.46 (0.13)	-17.38 (-0.20)	-6.38
9	Current Fallow	358.36 (4.12)	338.72 (3.90)	-19.64 (-0.22)	-0.40
10	Net Sown Area	5417.38 (62.36)	5238.39 (60.33)	-178.99 (-2.03)	-0.24

Source: The Directorate of Agriculture, Evaluation Wing, Government of West Bengal, 2015.

Note: Figures in Parentheses Indicate percentage; CGR= Compound Growth Rate per Annum.

Annexure-2. District-wise Changes in Land Use Pattern in West Bengal (2000-01 to 2014-15) (Area in Thousand Hectares)

District	Reporting Area			Forest Area			Other Uncultivable Land											
							Pastures & Grazing Land			Misc. Tree Crops & Groves			Cultivable Waste Land			Total		
	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR
Burdwan	698.45 (100)	698.76 (100)	-	28.78 (4.12)	21.16 (3.03)	-2.17	0.18 (0.03)	0.03 (0.01)	-12.01	0.63 (0.09)	0.92 (0.13)	2.74	7.53 (1.08)	2.92 (0.42)	-6.54	8.34 (1.20)	3.87 (0.56)	-5.34
Birbhum	451.12 (100)	451.12 (100)	-	16.03 (3.55)	15.85 (3.51)	-0.08	0.72 (0.16)	0.12 (0.03)	-12.01	0.78 (0.17)	0.77 (0.17)	-0.03	3.37 (0.75)	1.32 (0.29)	-6.46	4.87 (1.08)	2.21 (0.49)	-5.49
Bankura	688.10 (100)	688.00 (100)	-	148.35 (21.56)	148.93 (21.65)	0.03	0.66 (0.10)	0.47 (0.07)	-2.40	0.58 (0.08)	1.45 (0.21)	6.76	6.68 (0.97)	1.53 (0.22)	-9.99	7.92 (1.15)	3.45 (0.50)	-5.76
Purba Midnapore	490.74 (100)	396.59 (100)	-	1.22 (0.25)	0.90 (0.23)	-2.15	0.10 (0.02)	0.04 (0.01)	-6.34	3.41 (0.69)	1.87 (0.47)	-4.20	0.84 (0.17)	0.03 (0.01)	-21.18	4.35 (0.88)	1.94 (0.49)	-5.60
Paschim Midnapore	833.14 (100)	928.58 (100)	-	169.61 (20.36)	171.93 (18.52)	0.10	0.78 (0.09)	0.38 (0.04)	-5.01	7.71 (0.93)	4.66 (0.50)	-3.53	3.29 (0.39)	2.73 (0.29)	-1.32	11.78 (1.41)	7.77 (0.83)	-2.93
Howrah	136.01 (100)	138.68 (100)	-	-	-	-	0.09 (0.07)	(a)	-	1.10 (0.81)	1.31 (0.94)	1.26	0.26 (0.19)	0.05 (0.04)	-11.11	1.45 (1.07)	1.36 (0.98)	-0.46
Hooghly	312.22 (100)	313.38 (100)	-	0.65 (0.21)	0.53 (0.17)	-1.45	0.04 (0.01)	0.02 (0.01)	-4.83	2.29 (0.73)	1.35 (0.43)	-3.70	2.60 (0.83)	0.72 (0.23)	-8.76	4.93 (1.57)	2.09 (0.67)	-5.95
North 24Parganas	380.33 (100)	386.52 (100)	-	-	-	-	-	-	-	4.35 (1.14)	4.36 (1.13)	0.02	-	0.11 (0.03)	-	4.35 (1.14)	4.47 (1.16)	0.19
South 24Parganas	966.17 (100)	948.71 (100)	-	426.30 (44.12)	426.30 (44.93)	0.00	0.01 (a)	0.07 (0.01)	14.91	2.82 (0.29)	4.05 (0.43)	2.62	1.56 (0.16)	0.03 (a)	-24.59	4.39 (0.45)	4.15 (0.44)	-0.40
Nadia	390.66 (100)	390.66 (100)	-	1.22 (0.31)	1.22 (0.31)	0.00	0.10 (0.02)	0.04 (0.01)	-6.34	4.69 (1.20)	2.50 (0.64)	-4.33	1.00 (0.26)	0.32 (0.08)	-7.82	5.79 (1.48)	2.86 (0.73)	-4.91
Murshidabad	532.50 (100)	532.50 (100)	-	0.77 (0.14)	0.77 (0.14)	0.00	0.08 (0.01)	0.03 (0.01)	-6.77	1.19 (0.22)	1.45 (0.27)	1.42	0.69 (0.13)	0.47 (0.09)	-2.71	1.96 (0.36)	1.95 (0.37)	-0.04
Uttar Dinajpur	312.47 (100)	312.47 (100)	-	0.58 (0.19)	0.58 (0.19)	0.00	0.07 (0.02)	-	-	2.49 (0.80)	2.68 (0.86)	0.53	0.14 (0.04)	0.09 (0.03)	-3.11	2.70 (0.86)	2.77 (0.89)	0.18
Dakshin Dinajpur	221.91 (100)	221.91 (100)	-	0.93 (0.42)	0.93 (0.42)	0.00	-	-	-	0.58 (0.26)	1.20 (0.54)	5.33	0.03 (0.01)	0.11 (0.05)	9.72	0.61 (0.27)	1.31 (0.59)	5.61
Malda	371.05 (100)	370.86 (100)	-	1.67 (0.45)	1.68 (0.45)	0.04	-	-	-	3.09 (0.83)	2.85 (0.77)	-0.58	0.10 (0.03)	0.09 (0.02)	-0.75	3.19 (0.86)	2.94 (0.79)	-0.58
Jalpaiguri	622.70 (100)	622.70 (100)	-	179.00 (28.75)	179.00 (28.75)	0.00	0.01 (a)	-	-	6.51 (1.04)	4.43 (0.71)	-2.71	0.24 (0.04)	0.23 (0.04)	-0.30	6.76 (1.08)	4.66 (0.75)	-2.62
Darjeeling	325.47 (100)	325.47 (100)	-	124.58 (38.28)	124.58 (38.28)	0.00	1.17 (0.36)	0.50 (0.15)	-5.89	2.50 (0.77)	3.10 (0.95)	1.55	1.68 (0.52)	1.23 (0.38)	-2.20	5.35 (1.65)	4.83 (1.48)	-0.73
Cooch Behar	331.38 (100)	331.57 (100)	-	3.15 (0.95)	4.26 (1.28)	2.18	0.03 (0.01)	0.01 (a)	-7.55	6.09 (1.84)	6.51 (1.96)	0.48	0.75 (0.23)	0.72 (0.22)	-0.29	6.87 (2.08)	7.24 (2.18)	0.38
Purulia	623.29 (100)	625.65 (100)	-	87.60 (14.06)	75.05 (12.00)	-1.10	0.24 (0.04)	0.66 (0.10)	7.49	6.24 (1.00)	4.00 (0.64)	-3.13	6.38 (1.02)	4.23 (0.68)	-2.89	12.86 (2.06)	8.89 (1.42)	-2.60
West Bengal*	8687.71 (100)	8684.11 (100)	-	1190.44 (13.70)	1173.67 (13.52)	-0.10	4.28 (0.05)	2.37 (0.03)	-4.13	57.05 (0.66)	49.46 (0.57)	-1.01	37.14 (0.43)	16.94 (0.19)	-5.45	98.47 (1.14)	68.77 (0.79)	-2.53

Contd....

Area not Available for Cultivation									Fallow Land									Net Sown Area		
Land under Non-Agricultural Use			Barren & Uncultivable Land			Total			Other Fallow Land			Current Fallow			Total					
2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR	2000-01	2014-15	CGR

167.49 (23.98)	214.66 (30.72)	1.79	1.27 (0.18)	0.40 (0.06)	-7.92	168.76 (24.16)	215.06 (30.78)	1.75	5.31 (0.76)	0.80 (0.11)	-12.65	9.77 (1.40)	2.48 (0.35)	-9.33	15.08 (2.16)	3.28 (0.46)	-10.32	477.49 (68.36)	455.38 (65.17)	-0.34
81.84 (18.14)	101.72 (22.55)	1.57	1.74 (0.39)	0.10 (0.02)	-18.46	83.58 (18.53)	101.82 (22.57)	1.42	2.57 (0.57)	0.89 (0.20)	-7.29	6.54 (1.45)	3.02 (0.67)	-5.37	9.11 (2.02)	3.91 (0.87)	-5.86	337.53 (74.82)	327.33 (72.56)	-0.22
121.71 (17.69)	162.68 (23.64)	2.09	1.56 (0.23)	1.65 (0.24)	0.40	123.27 (17.92)	164.33 (23.88)	2.07	2.35 (0.34)	0.87 (0.13)	-6.85	62.14 (9.03)	33.11 (4.81)	-4.40	64.49 (9.37)	33.98 (4.94)	-4.47	344.07 (50.00)	337.31 (49.03)	-0.14
104.11 (21.22)	104.31 (26.30)	0.01	0.64 (0.13)	0.16 (0.04)	-9.43	104.75 (21.35)	104.47 (26.34)	-0.02	0.89 (0.18)	0.04 (0.01)	-19.88	2.46 (0.50)	0.76 (0.19)	-8.05	3.35 (0.68)	0.8 (0.20)	-9.72	377.08 (76.84)	288.49 (72.74)	-1.89
134.48 (16.14)	161.21 (17.36)	1.30	2.10 (0.25)	0.90 (0.10)	-5.87	136.58 (16.39)	162.11 (17.46)	1.23	4.19 (0.50)	1.57 (0.17)	-6.77	13.80 (1.66)	68.19 (7.34)	12.09	17.99 (2.16)	69.76 (7.51)	10.16	497.17 (59.68)	517.00 (55.68)	0.28
41.91 (30.81)	50.74 (36.59)	1.38	0.07 (0.05)	-	-	41.98 (30.86)	50.74 (36.59)	1.36	0.64 (0.47)	0.14 (0.10)	-10.29	4.91 (3.61)	3.45 (2.49)	-2.49	5.55 (4.08)	3.59 (2.59)	-3.06	87.04 (63.99)	82.98 (59.84)	-0.34
74.60 (23.89)	97.85 (31.22)	1.96	0.24 (0.08)	0.05 (0.02)	-10.60	74.84 (23.97)	97.90 (31.24)	1.94	0.49 (0.16)	0.13 (0.04)	-9.04	0.77 (0.25)	0.76 (0.24)	-0.09	1.26 (0.41)	0.89 (0.28)	-2.45	230.54 (73.84)	211.97 (67.64)	-0.60
101.74 (26.75)	127.67 (33.03)	1.63	-	0.01 (a)	-	101.74 (26.75)	127.68 (33.03)	1.64	-	0.01 (a)	-	14.38 (3.78)	22.27 (5.76)	3.17	14.38 (3.78)	22.28 (5.76)	3.18	259.86 (68.33)	232.09 (60.05)	-0.80
136.70 (14.15)	145.12 (15.30)	0.43	1.17 (0.12)	0.24 (0.02)	-10.70	137.87 (14.27)	145.36 (15.32)	0.38	0.14 (0.01)	0.18 (0.02)	1.81	19.18 (1.99)	10.84 (1.14)	-3.99	19.32 (2.00)	11.02 (1.16)	-3.93	378.29 (39.16)	361.88 (38.15)	-0.32
75.96 (19.45)	89.50 (22.91)	1.18	0.10 (0.02)	0.25 (0.06)	6.76	76.06 (19.47)	89.75 (22.97)	1.19	0.09 (0.02)	0.10 (0.03)	0.76	8.53 (2.29)	2.87 (0.73)	-7.49	8.62 (2.21)	2.97 (0.76)	-7.33	298.97 (68.33)	293.88 (75.23)	-0.12
114.24 (21.46)	130.45 (24.50)	0.95	1.83 (0.34)	1.46 (0.27)	-1.60	116.07 (21.80)	131.91 (24.77)	0.92	0.09 (0.02)	0.02 (a)	-10.19	20.57 (3.86)	0.85 (0.16)	-20.36	20.66 (3.88)	0.87 (0.16)	-20.25	393.04 (73.82)	397.01 (74.56)	0.07
30.89 (9.89)	33.10 (10.59)	0.49	0.12 (0.04)	0.04 (0.01)	-7.55	31.01 (9.93)	33.14 (10.60)	0.48	0.01 (a)	0.07 (0.02)	14.91	4.76 (1.52)	0.25 (0.08)	-18.98	4.77 (1.52)	0.32 (0.10)	-17.55	273.41 (87.50)	275.65 (88.22)	0.06
28.33 (12.77)	32.18 (14.50)	0.91	0.05 (0.02)	0.01 (a)	-10.86	28.38 (12.79)	32.19 (14.50)	0.90	0.04 (0.02)	0.04 (0.02)	0.00	1.49 (0.67)	0.06 (0.03)	-20.50	1.53 (0.69)	0.10 (0.05)	-17.70	190.46 (85.83)	187.38 (84.44)	-0.12
84.82 (22.86)	81.77 (22.05)	-0.26	-	-	-	84.82 (22.86)	81.77 (22.05)	-0.26	0.26 (0.07)	0.20 (0.05)	-1.86	58.20 (15.68)	49.95 (13.48)	-1.09	58.46 (15.75)	50.15 (13.53)	-1.09	222.91 (60.08)	234.32 (63.18)	0.36
93.66 (15.04)	91.82 (14.75)	-0.14	3.32 (0.53)	1.81 (0.29)	-4.24	96.98 (15.57)	93.63 (15.04)	-0.25	0.25 (0.04)	0.22 (0.03)	-0.91	3.20 (0.52)	8.46 (1.36)	7.19	3.45 (0.56)	8.68 (1.39)	6.81	336.51 (54.04)	336.71 (54.07)	0.00
41.17 (12.65)	40.21 (12.36)	-0.17	4.68 (1.44)	2.42 (0.74)	-4.60	45.85 (14.09)	42.63 (13.10)	-0.52	4.01 (1.23)	2.63 (0.81)	-2.97	8.80 (2.70)	15.14 (4.65)	3.95	12.81 (3.93)	17.77 (5.46)	2.37	136.88 (42.05)	135.66 (41.68)	-0.06
50.33 (15.19)	64.72 (19.52)	1.81	0.28 (0.08)	-	-	50.61 (15.27)	64.72 (19.52)	1.77	0.19 (0.06)	-	-	5.64 (1.70)	0.81 (0.25)	-12.94	5.83 (1.76)	0.81 (0.25)	-13.15	264.92 (79.94)	254.54 (76.77)	-0.29
83.41 (13.38)	112.51 (17.98)	2.16	7.18 (1.15)	1.38 (0.22)	-11.11	90.59 (14.53)	113.89 (18.20)	1.65	7.32 (1.17)	3.55 (0.57)	-5.04	113.23 (18.17)	115.45 (18.45)	0.14	120.55 (19.34)	119.00 (19.02)	-0.09	311.69 (50.01)	308.81 (49.36)	-0.07
1567.36 (18.04)	1842.22 (21.21)	1.16	26.86 (0.31)	10.88 (0.12)	-6.25	1594.22 (18.35)	1853.10 (21.33)	1.08	28.84 (0.33)	11.46 (0.13)	-6.38	358.36 (4.12)	338.72 (3.90)	-0.40	387.20 (4.45)	350.20 (4.03)	-0.72	5417.38 (62.36)	5238.39 (60.33)	-0.24

Source: Computed by the Author from Statistical Abstract 2015, Bureau of Applied Economics and Statistics, Government of West Bengal.

Note: * Excluding Kolkata; (a) = Negligible area; Figures in parentheses indicate percentage; CGR= Compound Growth Rate per Annual

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