CHAPTER-2

GEOGRAPHICAL BACKGROUND OF KOCH BIHAR DISTRICT

CHAPTER-2

GEOGRAPHICAL BACKGROUND OF KOCH BIHAR DISTRICT

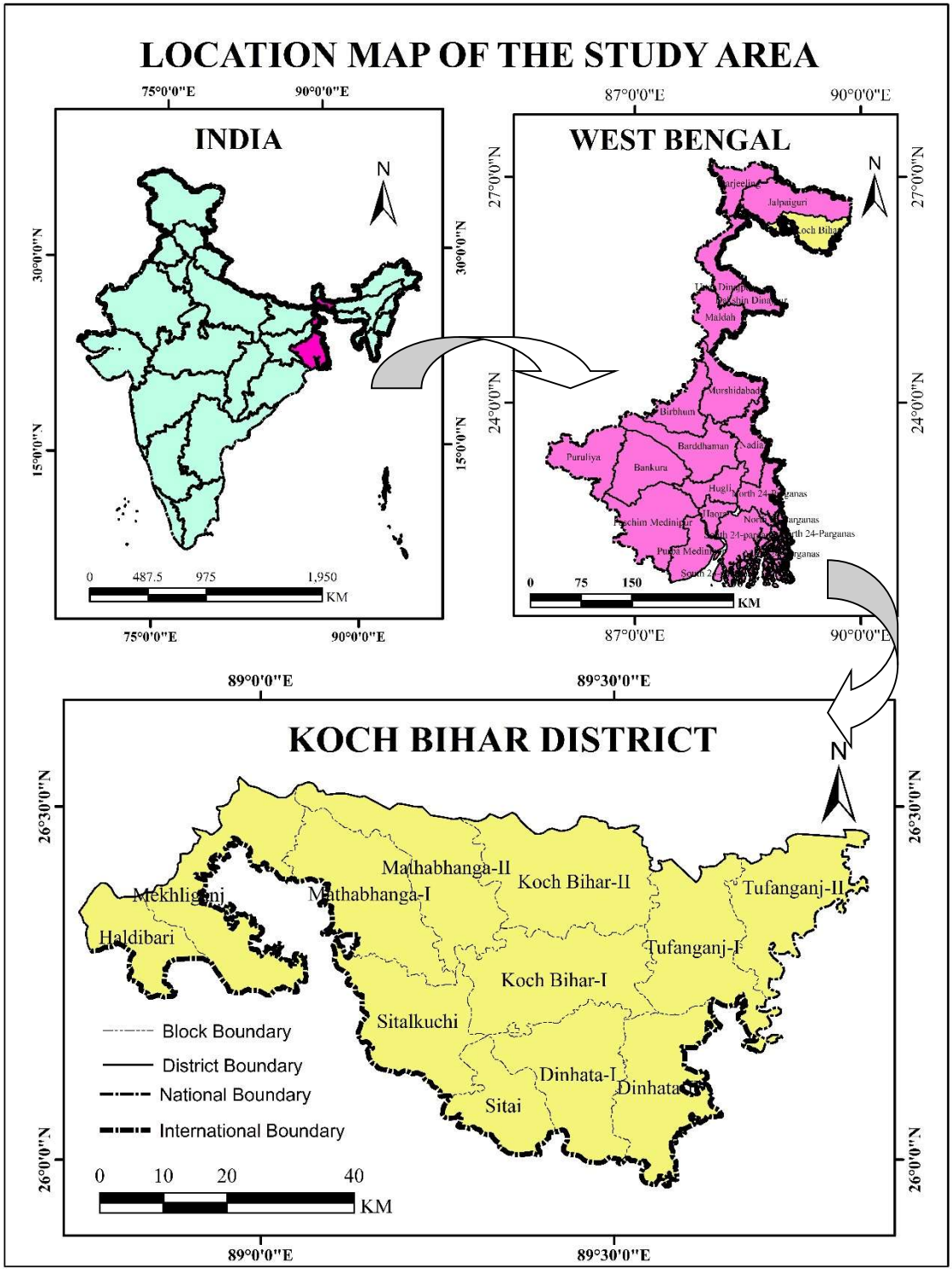
2.1. Introduction:

Koch Bihar has been transformed from an earlier kingdom to a state and from astate to the present status of a district. Unstill 28th August 1949 Koch Bihar was a Regal State administered by Maharaja of Koch Bihar who had been a contributory ruler under the British Government. By a report dated 28th August 1949, Maharaja Jagaddipendra Narayan of Koch Bihar surrendered his region to the area of Administration of India. The exchange of the organization to the Legislature of India occurred on the twelfth September 1949, from which date Koch Bihar was administered as a central Magistrate's territory by a Main Official arrangement by the Administration of India. At last Koch Bihar was moved and gotten together with the region of West Bengal on nineteenth January 1950. From that point forward Koch Bihar is being controlled as an area of West Bengal.

The name "Koch-Bihar" is gotten from the name of the Koch 'Rajbanshi' clan that is native to this district. The word "Bihar", the Sanskrit word (to travel) which means the land through which the *"Koch Rajbanshi"* Kings used to travel which means *'Nagar'* or *'Par'* (Comprehensive District Agriculture Plan Under Rashtriya Krishi Vikas Yojana, Koch Bihar District, West Bengal).

2.2. Location of the Study Area:

Koch Bihar district is located in the north-eastern frontier of India which is located under the Jalpaiguri division in West Bengal. The district is bounded by the district of Jalpaiguri and Alipurduar in the north, the state of Assam in the east by Bangladesh in the west as well as in the south. The latitudinal and longitudinal extension of the study area approximately is $25^0 57' 47"$ N to $26^0 36' 20"$ N and $88^0 47' 44"$ E to $89^0 54' 35"$ E respectively. The geographical area is 3387 sq. km which occupies 12 CD blocks, 128-gram panchayats with 1132 inhabited villages sharing only 3.82 percent landmass of West Bengal (Map 2.1).



Map 2.1: Location Map of the Study Area

2.3. Administrative Units:

Koch Bihar district comprises five subdivisions namely Koch Bihar Sadar, Dinhata, Mathabhanga, Mekhliganj and Tufanganj. Excepting the municipality area, everysubdivision

consists of CD blocks (Community development blocks) which in turn are split intorural areas and census towns. The district is comprised with 10 urban units consisting with 6 municipalities (Statutory towns) and4 CTs (census towns). The census also reveals that the Koch Bihar, Kharimala Khagrabari and Guriahati are sectors of an urban agglomeration.

Table 2.1: Administrative Set-up of Koch Bihar District

Sub-Division	CDBlock /M.	Panchayat			Inhabited Villages (2011)
		Samity	Gram	Gram Sansad	
Mekhliganj	2/2	2	14	158	194
	Mekhliganj	1	8	95	137
	Mekhliganj(M)	-	-	-	-
	Haldibari	1	6	63	57
	Haldibari(M)	-	-	-	-
Mathabhanga	3/1	3	28	409	260
	Mathabhanga-I	1	10	137	101
	Mathabhanga(M)	-	-	-	-
	Mathabhanga-II	1	10	135	92
	Sital Kuchi	1	8	137	67
Koch Bihar Sadar	2/1	2	28	428	253
	Koch Bihar-I	1	15	208	142
	Koch Bihar (M)	-	-	-	-
	Koch Bihar -II	1	13	220	111
Tufanganj	2/1	2	25	285	125
	Tufanganj -I	1	14	161	72
	Tufanganj(M)	-	-	-	-
	Tufanganj -II	1	11	124	53
Dinhata	3/1	3	33	434	300
	Dinhata -I	1	16	204	128
	Dinhata (M)	-	-	-	-
	Dinhata-II	1	12	159	119
	Sitai	1	5	71	53
District Total - 5	12/6	12	128	1714	1132

Source: i) Census of India, 2001 & 2011
ii) Official website of Koch Bihar district: http://www.coochbehar.nic.in/

2.4. A Brief History of Population Growth in Koch Bihar District:

The history of conduct of Census in district Koch Bihar is strikingly archaic. King Viswa Singha, who ruled Koch Bihar from 1522 to 1555 CE, conducted first Population Census in the Kingdom. However, his interest was mainly of the able bodied male population who are capable of joining the Royal forces during the War (Ghoshal, 1942). The first Census of Koch Bihar in the modern era was conducted between November, 1871 to February, 1872 showing a population figure of 5, 32,565. The average density of population in the district

was 407 persons per square miles. Although the concept of villages in feudatory state of Koch Bihar differed from that of the villages in other areas of Bengal, there were 1199 number of habitations in the state (District Census Handbook, Koch Bihar, 2011).

During the succeeding Census in 1881, population rose by 13.2% and was recorded at 6, 02,624. However, due to some natural calamities like earthquakes and floods, population of feudatory state of Koch Bihar reduced during next two decades. With the exception of such few cases, population of Koch Bihar district rose has recorded a modest rise and during the first Census of independent India, it was recorded at 6, 71,158. In all decades Koch Bihar Sadar Sub-Division has remained highest populated, both in terms of density and absolute figures. Another important feature of the population of district Koch Bihar is that being ruled by feudatory rulers under British regime, the state has attracted considerable number of immigrants from other places, including the neighbouring districts. Immediately after independence along with partition, this immigration rose to 1, 45,916 out of a total population of 6, 71,158 which is almost 21.75%.Migration has been a key element of social evolution (Bacci, 2018). Scheduled Caste population is the district is dominant social groups in West Bengal (50.17% as per 2011 Census of India). Ethnicity wise the most dominant population group in Koch Bihar district are the *Rajbanshis.*As noted in The Koch Bihar State and its Land Revenue Settlements by Babu Harendra Narayan Chaudhuri the term *`Rajbanshi '* can be regarded as an addition of honour, meaning `related to the Royal family'. Another theory of origin of the caste is that during invasion of Aryans in the east, the caste might have created from intermixing of Aryans, Assamese and the Bengalis of the region (Hunter, 1876; Census of India, 2011).

2.5. Geographical Background:

The geographical, demographical, socio-economic, environmental condition, etc. may be divided into two categories, such as i) Physical aspects like relief, Physiography, drainage, soil, vegetation, etc. ii) Socio-economic aspects like demography, agriculture, health, industry, etc. In this regard, this study is to analyze the physical as well as socio-economic factors that compelled people of Koch Bihar district.

2.6.1. Physical Aspects

The district belongs to the sub-Himalayan foothill region whereas the maximum altitude is 75 meter and minimum altitude is 28 meter. The average height of Koch Bihar district is 60 M from MSL. Koch Bihar is generally flat topography where the general slope is North West to the south-east. Mekhliganj, Haldibari have the maximum altitude where the

minimum altitude is found in Dinhata, Sitalkhuchi, and sitai. Koch Bihar district is a part of the plain region which is formed by the intersection of sub-Himalayan Rivers. The type of the soil is generally friable loam. The depth of the soil is ranging 0.15 to 1 meter, and it superimposed by sand. The river beds are changing every year. The characteristics of sub-Himalayan Rivers are that, rivers tend to cut down the new channel annually when excessive rainfall or flood occurs. It resulted in the new formation of various marshes over the plains which are scattered. According to Oil and Natural Gas Commission, conducted by seismic surveys of the government of India, igneous and metamorphic rocks are found at the depth between 1000 to 1500 meters, and the slope of the basement surface is northerly. The Koch Bihar district originated of fluvial-catastrophic deposit in the quaternary geological period (Mazumdar, 1977). The Koch Bihar district has a network of rivers and small streams. The rivers are flowing north-east to south-west direction following the relief slope in Koch Bihar district. Most of the rivers entire the district from western part (Duars) and after passing through the district, the rivers are entire Rangpur district to join the Brahmaputra in Bangladesh. The beaches are found only one side of the river. The beds of the rivers are formed by the boulders, pebbles, rocks, gravel sand and silt. During the monsoon period, the rivers become very turbulent. A little amount of rainfall in the hilly region generated a sudden rise of water level in the streams. The crops are destroyed by the flood, occurred in the streams. The changes of the river course are the common features of sub-Himalayan Rivers, mostly during the monsoon season by losing the sandy soil.

In Koch Bihar district have a number river and rivulets. The principal river of the district is Tista, Torsa, Jaldhaka, Dharla, Mansai, Kaljani, Raidak, Gadadhar and Sankosh. Except these, there are several small rivers are Sutunga, Khutamara, and Giridhari, etc. In the district, the rivers are classified into two categories, like perennial and non-perennial. The big rivers are perennial in nature such as Tista, Torsa, etc. The pattern of the rivers in Koch Bihar district is parallel. In other words, there has a parallel drainage pattern. The principal rivers are flowing parallel to each other. Climate is one of the important physical factors affecting rural out-migration or movements of people from one place to another. It has different elements like temperature, sunlight, frost, fog, moisture, snow etc. All these elements have direct and indirect impacts on cropping pattern of a region (Debnath, 2003). There is a notable extremity in temperatureand rainfall in Koch Bihar district. The climate of the district as a whole is characterized by tropical monsoon. There is only one Meteorological Station in the district which is located at Koch Bihar town (Roy, 2009). In the district during the south-west monsoon, 70 percent of annual rainfall is received. The

temperature is moderate throughout the year in the district. The maximum mean minimum temperature was observed in July whereas the mean maximum temperature was highest in August (36˚ C). It was also observed that the mean maximum temperature was consistently high during the summer season (Miraj, 2018). In the Koch Bihar district, the alluvial soil is found everywhere in which is formed by many river systems. This type of alluvial is the recent formation. Sandy loam is the major type of soil in the Koch Bihar district. It found in the depth between 0.15 to 1 meter and it superimposed by sandy soil. The district is situated near the foothills of Eastern Himalaya from where after rains in the catchments area of each of the rivers generally attain strong current and flood the adjacent area (Roy, 2009).

Land Use /land cover*:*

The land is the major component of nature which changes with time. Land use/ land cover change means the alteration of land from one use to another and it is mainly controlled by the society's demand and human activities. The change in land/and land cover is caused by various natural and manmade factors. For the study of land use /land cover a proper understanding and intensive monitoring of such factors is needed (Rahman et al. 2011).

Table 2.2: Description of Land Use/Land Cover Classes

Sl No.	Land Class	Description
1.	Vegetation	This is the area with green trees, plant cover, and grassland, dense and sparse vegetation growing in the area.
2.	Water body	This class defines the presence of water either in the form river or any man-made water reservoir.
3.	Agricultural land	This class describes the land of crop cultivation. It is the net shown area of the district.
4.	Built-up area	This class indicates the settlement in rural and urban areas, industrial area, transportation sector and bare land (land left without vegetation cover).
5.	Sand deposition	This class is the deposition of sand along the river.

To examine this change LANDSAT 7 ETM+ and LANDSAT 8 OLI data has been used for 2000 and 2019. Supervised classification using maximum likelihood classifier has been applied for preparing land use/ land cover map and to detect the change on Arc GIS 10.1.

Kappa Coefficient has also done to assess the accuracy of the result. The study finds major alteration of agricultural land into the built-up area. There is also a significant reduction in vegetation cover in Koch Bihar district during the period. Urban expansion and population growth lead to a drastic change in land use/land cover.

Table 2.3 shows the pattern of land use/ land cover for both the year and the changes is noticeable. Among the major 5 classes, agricultural land covers highest share in 2000 (78.23%) followed by vegetation (8.73%), built-up area (7.91%), water body (2.49%) and sand deposition (2.23%).

It also reveals substantial changes in all the classes. Agricultural land has witnessed a decrease and built-up area has increased over the period. Agricultural land declined from 78.23 percent in 2000 to 72.35 percent in 2019, the declined has converted most of the land into the built-up area. As a result, the built-up area has increased from 7.91 percent in 2000 to 13.85 percent in 2019. Rapid population growth is a major cause of such change as people are converting cropland into a settlement. Vegetation cover is also showing a declining trend from 8.73 percent in 2000 to 6.94 percent in 2019, which is also due to increase in population and urbanisation process, creation of road, service sector. The area under water body also declined from 2.49 percent to 2.04 percent due to an increase in urbanisation, the natural earth surface is covered by the settlement, conversion of agricultural land etc. But sand deposition has increased from 2.64 percent to 4.82 percent in 2019. However, the transformation is mainly concentrating on converting the agricultural land into the built-up area.

Table 2.3: Land Use /Land Cover of Koch Bihar District, 2000-2019

LULC Class	LULC 2000		LULC 2019		Change
	Area	%	Area	%	
Vegetation	295.66	8.73	235.09	6.94	-1.79
Water body	84.29	2.49	69.08	2.04	-0.45
Built-up area	267.83	7.91	469.12	13.85	5.94
Agricultural land	2649.89	78.23	2451.03	72.35	-5.88
Sand deposition	89.84	2.64	163.19	4.82	2.18
Total	3387.51	100	3387.51	100	

Source: LANDSAT 7 ETM+ & LANSAT 8 OLI data (2000 & 2019)

Figure 2.1: Land Use & Land Cover in Koch Bihar District, 2000

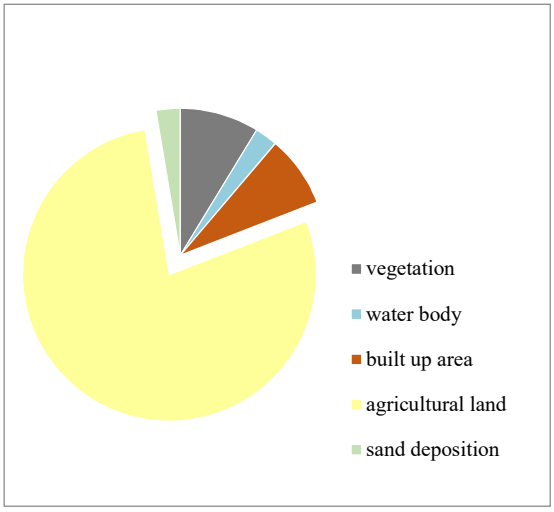
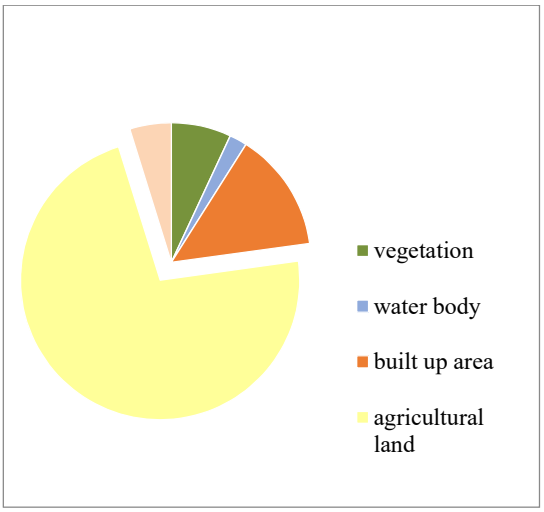


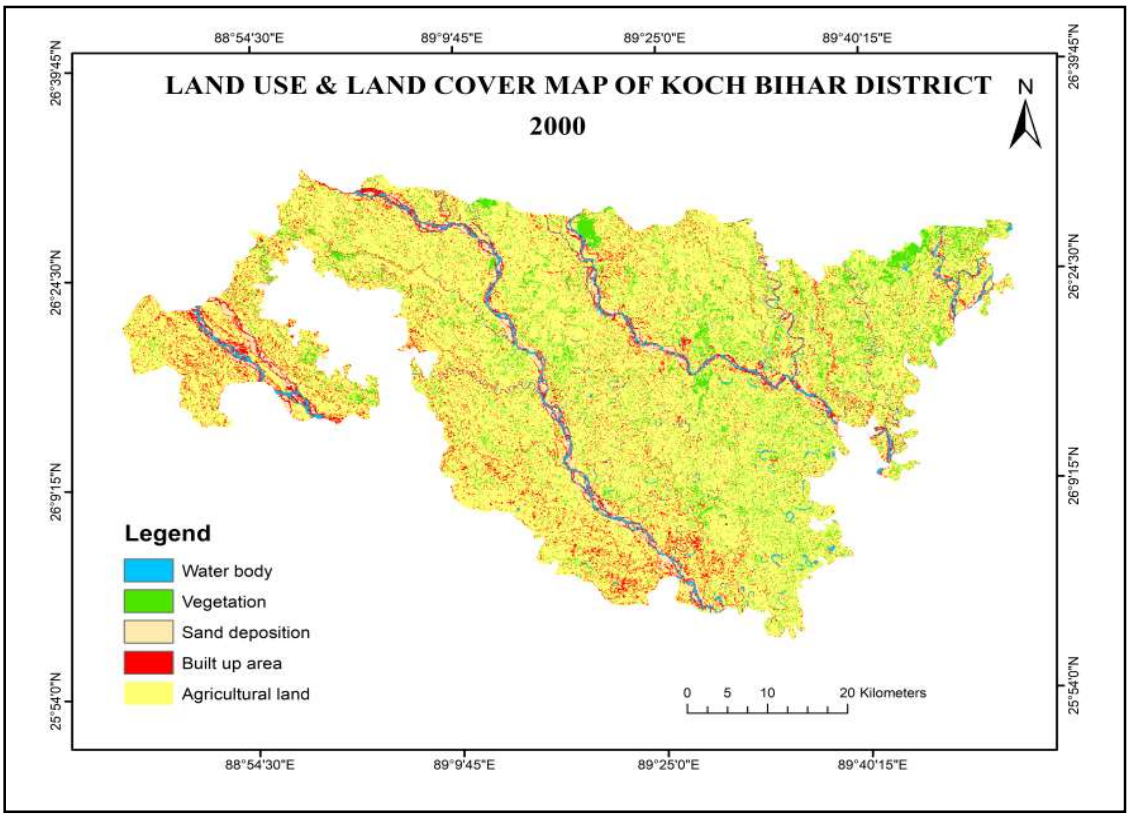
Figure 2.2: Land Use & Land Cover in Koch Bihar District, 2019



Land-use change in Koch Bihar district is largely contributed to the location of main district town which shows a remarkable increase in built-up area and a decrease in vegetation and cropland (figure 2.1 & 2.2). The increase in the population of the district and transformation of the rural economy to the modern economy has played a crucial role in changing existing land use pattern. In this district fertile agricultural land and vegetation cover has declined at the cost of increasing number of settlement, road network and service sector. In 2001 district population was 24.79 lakhs which became 28.19 lakhs in 2011 according to census data. The number of Census Town has also increased from 4 in 2001 to 12 in 2011. Increasing population pressure, industrialisation, creation of transport and service sector during this period has changed the land use pattern. This dynamic land resource utilisation, an unplanned transformation of land may cause deterioration of the environment like water, air, noise pollution. It is clear from the maps that within this period rapid urbanisation, increase in population took place which causes alteration of agricultural land into the built-up area.

The total area of the district has not been changed but it shows a major change in land use pattern in all the land-use class. The transformation shows that area achieved by agricultural land is 468.10 sq km in which 186.91 sq km is gained from vegetation, 218.62 sq km from built-up area, and 33.69 sq km from sand deposition and 28.88 sq km from water bodies. It is mainly due to the cutting of trees and converting the forest area into agricultural land to meet the need of food. It is also remarkable that 154.70 sq km of agricultural land has been converted into a built-up area. However, 40.42 sq km built-up

area, 36.32 sq km sand deposition area, 92.71 sq km vegetation, 15.31 sq km water body shows no significant changes during the period (table 2.4).

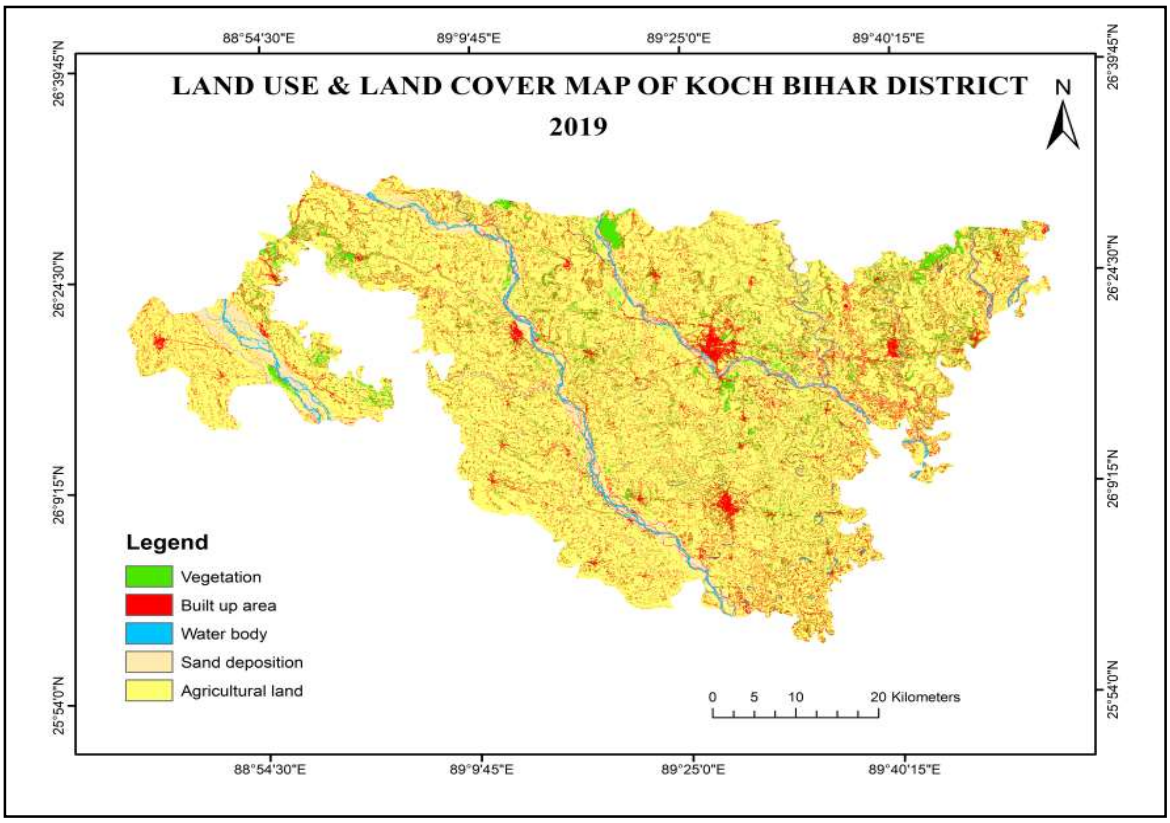


Map 2. 2: Land Use and Land Cover Map of Koch Bihar District in 2000

Table 2.4: Land Use/Land Cover Change (2000-2019)

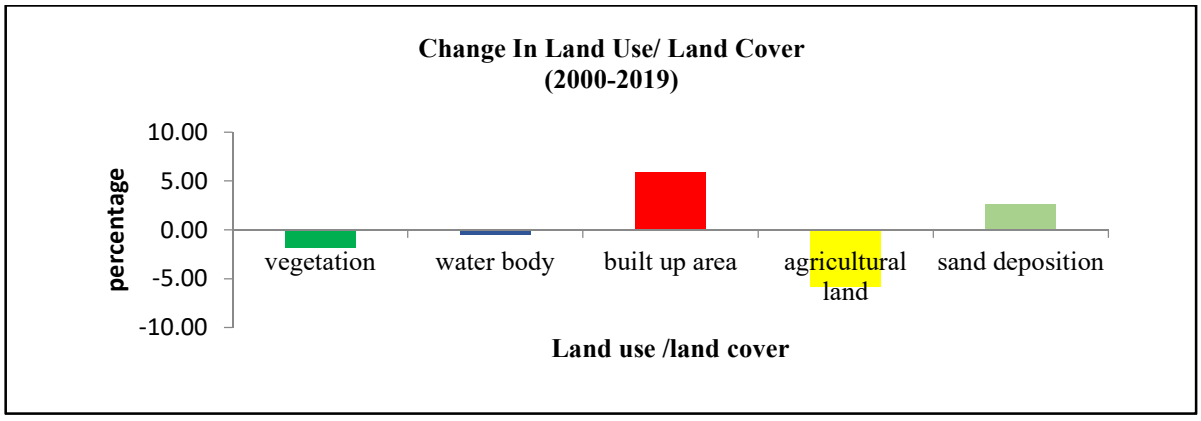
Land use/land cover		Agricultural land	Built-up area	Sand deposition	Vegetation	Water body
LULC 2000	Agricultural land	**2062.77**	154.70	44.28	122.21	15.67
	Built up	218.62	**40.42**	37.37	7.86	13.50
	Sand deposition	33.69	8.22	**36.32**	1.18	10.07
	Vegetation	186.91	79.31	2.16	**92.71**	1.72
	Water body	28.88	16.43	21.11	2.40	**15.31**

Source: LANDSAT 7 ETM+ & LANSAT 8 OLI data (2000 & 2019)



Map 2. 3: Land Use and Land Cover Map of Koch Bihar District in 2019

Figure 2.3: Change in Land Use/ Land Cover (2000-2019) in Koch Bihar District



Accuracy assessment is very important to know the reliability of image classification. For this purpose overall accuracy, producer accuracy and Kappa Coefficient has been incorporated with 50 sample points (Prakash and Gupta, 1998; Deng et al. 2008) based on these 50 samples overall accuracy is 84 % i.e., good accuracy and Kappa Coefficient is 0.80 that means there is 80% of good accuracy than by chance alone (Table 2.5).

Table 2.5: Error Matrix and Accuracy Assessment for 2019 Classified Map

Error matrix and Accuracy Assessment	Vegetation	Water body	Built-up area	Agricultural land	Sand deposition	Total	User's Accuracy
Vegetation	8	0	1	1	0	10	80
Waterbody	0	10	0	0	0	10	100
Built-up area	0	0	9	1	0	10	90
Agricultural land	1	0	2	7	0	10	70
Sand deposition	0		2	0	8	10	80
Total	9	10	14	9	8	50	
Producer's Accuracy	88.89	100	64.29	77.78	100		

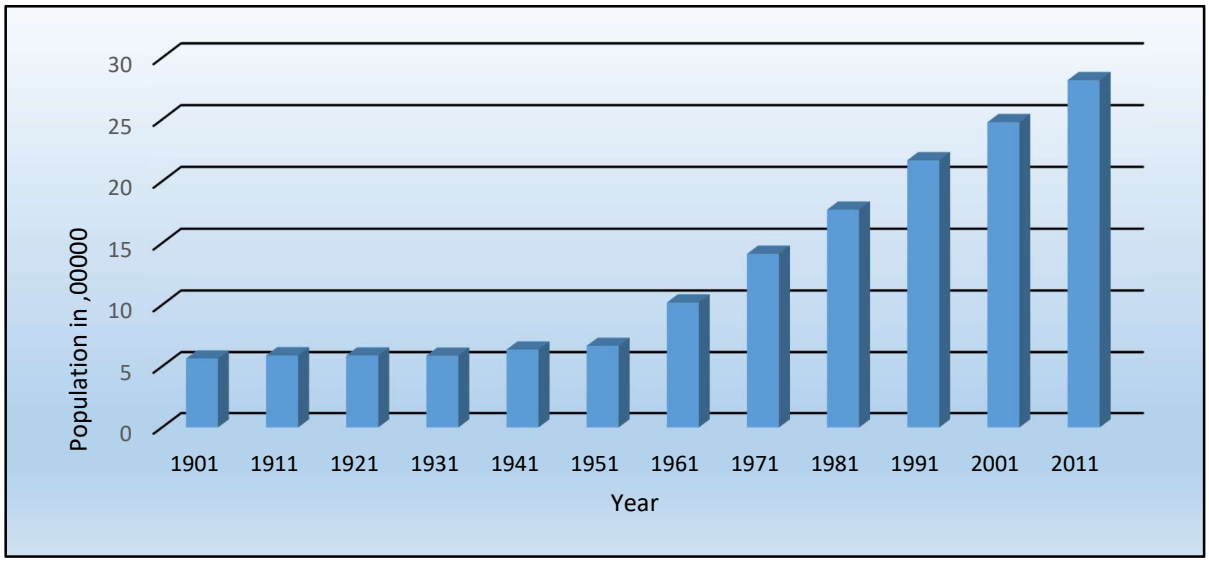
Overall Accuracy=84.00 %, Kappa Statistics=0.80

2.5.2. Demography of Koch Bihar District

2.5.2.1. Population and Growth

The Population is a dynamic concept. It changes over time. In developing countries population changes is the most central point. Koch Bihar district in West Bengal lies in the international bounder (Bangladesh). That's why the population increases very much the 1970s; many people moved out from Bangladesh to Koch Bihar district. In 1901 the total population of Koch Bihar district was only 565116. The size of the population was more or less constant up to 1951. Within 50 years, the population only increased more or less 1 lakh. After 1951 the population increased very rapidly because of immigration from Bangladesh. The following table depicted that in the pre-independence period, the population growth of Koch Bihar district was negative because of different factors like epidemics, disasters etc. But, after 1947, the partition of India, the district having an unprecedented rate of population growth was recorded due to huge immigrants from East Pakistan (now Bangladesh) (Miraj, 2018). The debate had raised for illegal immigrants or 'refugees' but this cross border migration it refused that they are not refugees (Rahman and Schendel, 2003). Although from 1991 onwards growth rate has started declining.

Figure 2.4: Population Growth in Koch Bihar District from 1901 to 2011



Source: Census of India, 2011

In 1951, the population was 668949, which increased 1961 into 1019806. From this time the population increases exponentially (Figure 2.4 and **Appendix-II.C**). In 2001 census, Koch Bihar's population was about 25 lakhs, where the male population is 51percent, and the female population was 49percent. But in the 2011 census, Koch Bihar's population was about 28 lakhs, where the male population is 59percent and the female population was 41percent. The population growth means differences of birth and death, which is also called as Natural Increase. The year 1921 known as the demographic dividend of India because of negative growth rate, but in the Koch Bihar district, the negative growth rate occurred in 1921 and 1931. This two-decade has negative population growth (-0.07 and -0.26 respectively). The decadal growth rate of the Koch Bihar district was low up to 1951 when the decadal growth rate was only 4.74. But in 1941 the growth rate was likely higher at 8.43. The year 1951 was the demographic dividend in the history of the Koch Bihar district, because of the growth rate was only 4.74 in 1941 and 52.45 in 1951. Only one decade, the net decadal growth rate was 48. From 1951 the population growth decreases rapidly. The decadal growth rate is 13.71 in 2011, where it was 14.19 in 2001 (table 2.6).

Table 2.6: Decadal Growth Rate of Population in India, West Bengal, and Koch Bihar District.

Year	India		West Bengal		Koch Bihar District	
	Total Population	Decadal Growth Rate	Total Population	Decadal Growth Rate	Total Population	Decadal Growth Rate
1901	2383,96,327	---	169,40,088	---	5,65,116	---
1911	2520,93,390	+5.75	1,79,98,769	+6.25	5,91,012	4.58
1921	2513,21,213	- 0.31	1,74,74,348	-2.91	5,90,599	-0.07
1931	2789,77,238	+11.00	1,88,97,036	+8.14	5,89,053	-0.26
1941	3186,60,580	+14.22	2,32,29,552	+22.93	6,38,703	8.43
1951	3610,88,090	+13.31	2,62,99,980	+13.22	6,68,949	4.74
1961	4392,34,771	+21.51	3,49,26,279	+32.80	10,19,806	52.45
1971	5481,59,652	+24.80	4,43,12,011	+26.87	14,14,183	38.67
1981	6833,29,097	+24.66	5,45,80,647	+23.17	17,71,643	25.28
1991	8464,21,039	+23.87	6,80,77,965	+24.73	21,71,145	22.55
2001	102,87,37,436	+21.54	8,01,76,197	+17.77	2479155	14.19
2011	1,21,08,54,977	+17.70	9,12,76,115	+13.84	2819086	13.71

Source: Census of India, 2001 & 2011

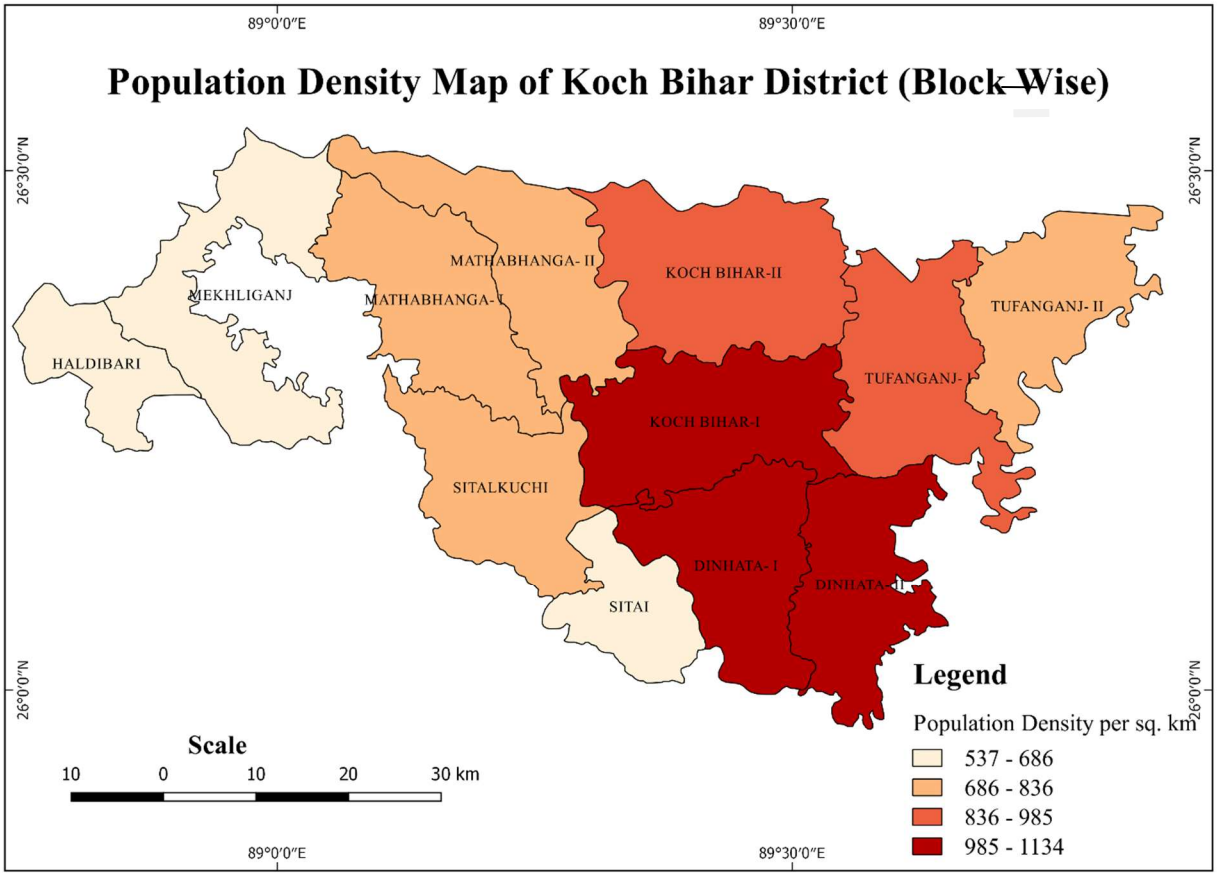
2.5.2.2. Population Density

The size of the population and population density has a linear relationship if the area is constant. With the increasing the population, the population density also increases. Out of five North Bengal districts, Koch Bihar district has a significant population density. According to the 2011 census of India, the population density of Koch Bihar district is 832 persons/sq km. In this district, 430 persons averagely founded per square kilometre in 1901. In 1961 census of India, Koch Bihar district has 776 persons per square kilometre against the state population density 1021 (table 2.7 and map 2.7).

Table 2.7: Trend of Population Density of Koch Bihar District.

Year	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001	2011
Density (persons/sq. km)	167	174	174	174	189	198	301	418	523	641	732	832

Source: Census of India, 2001 & 2011



Map 2.7: Population Density Map of Koch Bihar District (Block-Wise)

2.5.2.3. Sex-Ratio

Males are more than female found all over the Indian sub-continent as well as West Bengal. Koch Bihar district is not exceptional. In Koch Bihar district males have always outnumbered females since 1901. The sex ratio going down up to 1951 when the sex ratio was 855 female per 1000 males. The sex ratio of the rural area was always less than in urban areas. In the 1901 census, the sex ratio of the rural area was 892 where urban areas 540 only. From 1961, the sex ratio increases until 2001. In 1991 it was 935 and in 2001 the sex ratio was 948 female per 1000 male population, where the rural sex ratio was 947 and the urban sex ratio was 964 female per 1000 male population. Present time (2011 census) the sex ratio of Koch Bihar district is 942 female per 1000 male population, where the rural sex ratio was 939 and urban sex ratio was 974 female per 1000 male population (figure 2.5).

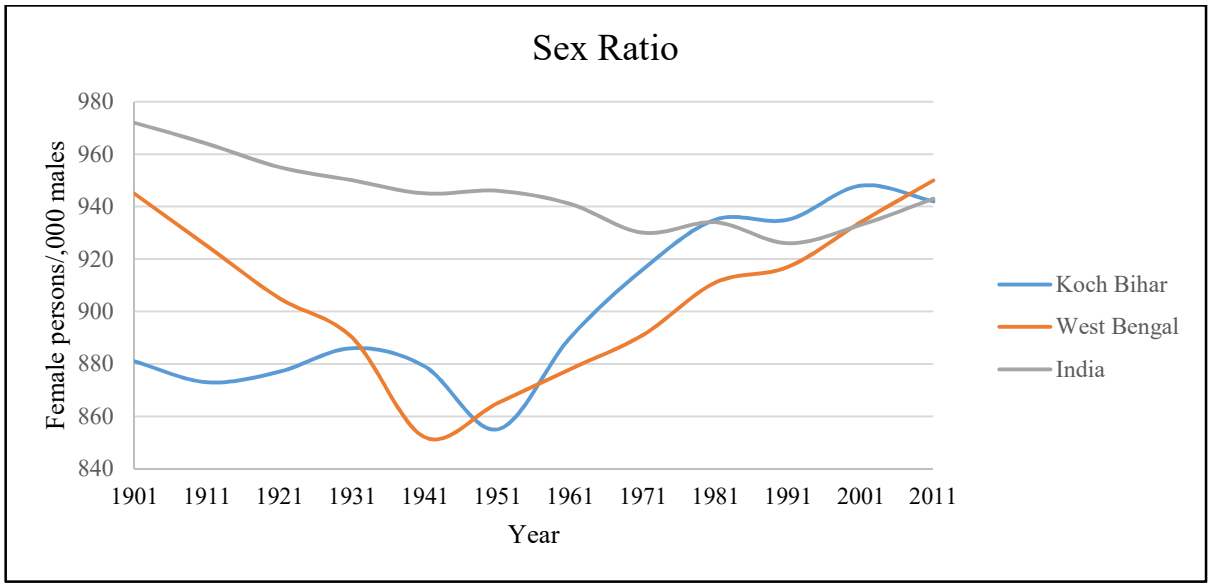
2.5.2.4. Fertility

The population changes of a particular place, fertility have the greater influences over the other components of population changes. Fertility express as the production of offspring. For the measurement of the level of fertility, there have different measurements, such as

Crude Birth Rate, General Fertility Rate, Age-Specific Fertility Rate, Total Fertility Rate etc.

In West Bengal, the crude birth rate (CBR) is 17.3 whereas the study area has the CBR 18.6 in 2011 census. The Total Fertility Rate (TFR) of Koch Bihar district was 3 in 2001 census and present time it (TFR) declines 2.3 against the state average 2 in 2011 census.

Figure 2.5: Variation of Sex ratio of Koch Bihar District From 1901 to 2011

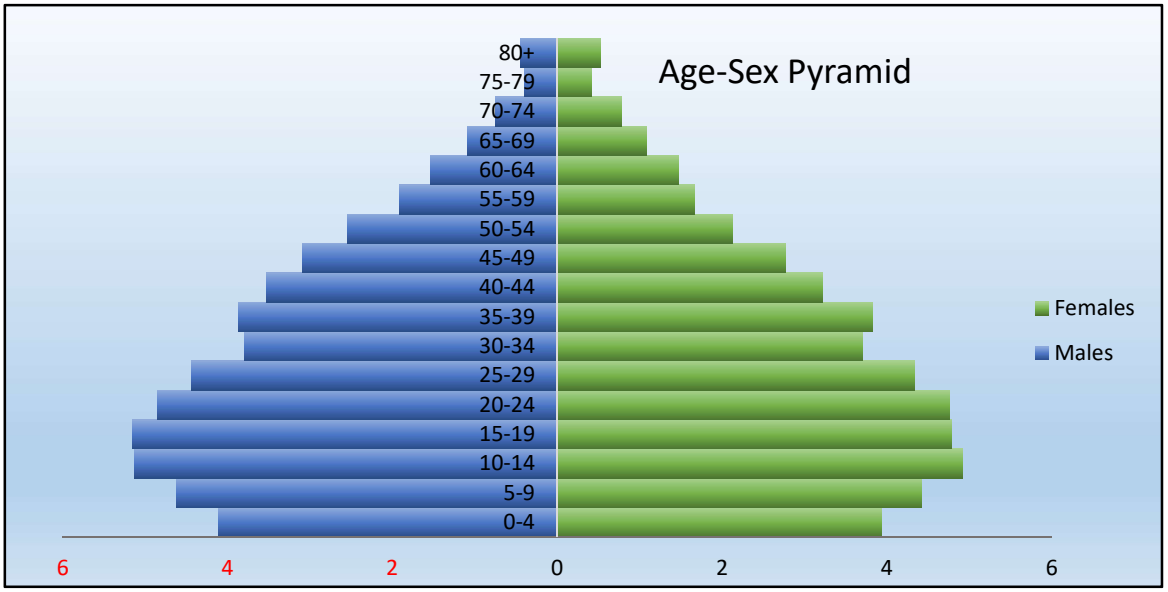


Source: Census of India.

2.5.2.5. Age-Sex Composition

The age-sex pyramid is the graphical method to express the composition of the population of a specific area. It is age and sex-wise population distribution over X and Y-axis. The importance of age-sex pyramid is very wider in demography. It indicates the socio-economic development, women empowerment and dependency population etc. The structure of the pyramid indicates the level of development. Basically, in a developed country the base of the pyramid is small than the middle parts of the pyramid and developing countries have a wider base because of the high birth rate. The base of the pyramid indicates the child population, the middle part of the pyramid express the working population and the upper part of the pyramid indicate the ageing population. The age-sex pyramid also expresses the level of fertility, mortality, migration. High fertility- wider base, high mortality- wider top and wider middle part indicate more working population. Similarly, low fertility indicates narrow base, low mortality-wider top.

Figure 2.6: Age-Sex Pyramid of Koch Bihar District



Source: census of India, 2011

The age-sex pyramid of Koch Bihar district looks like a pyramid of developing countries. This pyramid indicates high fertility and high mortality with a high dependency ratio. The child dependency ratio (0-14 age group) of Koch Bihar district is 42percent and the old-age dependency ratio is 13percent in 2011. The total dependency ratio of Koch Bihar district is about 55percent (figure 2.7).

2.5.2.6. Rural and Urban Distribution of Population

Koch Bihar district has the international border of its one-third boundary. The district's economy is based on agricultural activity. So, the urban population cannot be developed well. The district has about 90percent rural population and only 10 percent in urban. The basic urban amenities are not found all over the districts urban areas. Mainly Koch Bihar Sadar (municipalities) has well urban amenities. Out of 12 blocks, only 7 blocks have the urban population. Koch Bihar-II block has the highest amount of urban population (table 2.8).

Table 2.8: Rural-Urban Distribution of Koch Bihar District

Blocks	Rural			Urban			Total Population		
	No. of Male	No. of Female	Total	No. of Male	No. of Female	Total	No. of Male	No. of Female	Total
Koch Bihar-I	1,51,337	1,41,930	2,93,267	16,848	16,443	33,291	1,68,185	1,58,373	3,26,558
Koch Bihar-II	1,51,946	1,37,971	2,89,917	27,645	26,339	53,984	1,79,591	1,64,310	3,43,901
Dinhata-I	1,45,325	1,36,565	2,81,890	2,277	2,102	4,379	1,47,602	1,38,667	2,86,269
Dinhata-II	1,26,663	1,17,403	2,44,066	-	-	-	1,26,663	1,17,403	2,44,066
Sitai	56,016	54,317	1,10,333	-	-	-	56,016	54,317	1,10,333
Mathabhanga-I	1,12,497	1,05,694	2,18,191	-	-	-	1,12,497	1,05,694	2,18,191
Mathabhanga-II	1,17,100	1,10,297	2,27,397	-	-	-	1,17,100	1,10,297	2,27,397
Sitalkuchi	94,277	91,076	1,85,353	-	-	-	94,277	91,076	1,85,353
Mekhliganj	77,801	72,966	1,50,767	2,251	2,232	4,483	80,052	75,198	1,55,250
Haldibari	52,851	51,118	1,03,969	-	-	-	52,851	51,118	1,03,969
Tufanganj-I	1,25,672	1,17,584	2,43,256	2,743	2,596	5,339	1,28,415	1,20,180	2,48,595
Tufanganj-II	93,431	87,815	1,81,246	2,791	2,689	5,480	96,222	90,504	1,86,726
District Total	13,04,916	12,24,736	25,29,652	1,46,626	1,42,808	2,89,434	14,51,542	13,67,544	28,19,086

Source: Census of India, 2011

2.5.2.7. Caste and Religion Composition

Koch Bihar district has the largest number of *Rajbanshis* people that's why; the SC population is high concentrated (50.2percent, in 2011) over the other castes, like ST (0.6percent, in 2011) and OBC. More than 50percent of people are SC category in the district. In West Bengal, the largest number of SC population found in Koch Bihar district. In 1991, the SC population was 51.76percent to the total population and in 2011 census it is 50.2percent to the total population. The percentage is decreasing but the absolute number of SC population is increasing today (table 2.9).

In the religious composition, the Hindu (76.44%) is the largest religion in the district in 2011 census followed by Muslim (23%).

Table 2.9: Caste and Religion Composition

Caste & Religion Composition	1991	2001	2011
SC	1123719	1242374	1414336
% of Total	51.76	50.11	50.2
ST	13273	14246	18125
% of Total	0.6	0.54	0.6
Hindu	1659733	1871857	2087766
% of Total	76.44	75.5	74.06
Muslim	506728	600911	720033
% of Total	23.34	24.24	25.54
Others	4684	5648	7033
% of Total	0.22	0.23	0.27

Source: Census of India, 2001 & 2011

2.5.2.8. Agriculture of Koch Bihar District

The economy of Koch Bihar district is based on agriculture. In the Koch Bihar district, the principal crops are Rise, Cereals, Pulses, Foodgrains, Oilseeds, and Fibres etc. Rise is the dominant crop in the cultivation in Koch Bihar. Up to the 2008-2009 year, the area was increasing but from that period, the area of cultivation is decreasing. The land use pattern of Koch Bihar district is very dynamically changed. The agricultural land is converted into residential area or industry or other purposes (Census of India, 2011).

Table 2.10: Production and Yield Rates of Principal Crops in Koch Bihar District

Crops	2007-08		2008-09		2009-10		2010-11		2011-12	
	Production ('000 ton)	Yield Rates (kg per ha.)	Production ('000 ton)	Yield Rates (kg per ha.)	Production ('000 ton)	Yield Rates (kg per ha.)	Production ('000 ton)	Yield Rates (kg per ha.)	Production ('000 ton)	Yield Rates (kg per ha.)
Rice	518.8	1768	500.4	1615	561	2047	656.9	2386	600.7	2198
Total Cereals	606.3	1911	566.4	1720	648.8	2177	730.5	2471	678.8	2308
Total Pulses	3.7	625	4.4	618	4.1	711	4.1	730	4.4	695
Total Food grains	610	1887	570.8	1697	652.9	2150	734.6	2439	683.2	2275
Total Oil Seeds	9.6	0	6.2	422	6.3	518	8.2	568	7.5	501
Total Fibres	988.6	11.2	980.8	11.5	1088.5	12.4	715.1	9.5	1029.4	12.96
Total Misc. Crops	514.2	13496	376.9	7825	883	17767	690.3	13240	736.9	14775

Source: Directorate of Agriculture, Government of West Bengal

Table 2.10 shows the production and yield of principal crops of Koch Bihar district in 2007-08 to 2011-12 time periods. The production of rice is increased 15.78percent between these periods. The maximum increases occurred among these crops is misc. crops (+43%). It indicates the agriculture of Koch Bihar district is transforming intensive farming to mix or horticulture. The production of oilseeds is decreasing today in Koch Bihar district. The yields rates (kg per hector) of crops are increasing. The yields rates (kg per hector) increased the maximum of oil seeds followed by rise, fibre.

2.5.2.9. Occupational Structure of Koch Bihar District

The economy of a particular region is dependent on its working population, which is also called the occupational structure of that region. The working population includes the peoples who are economically active and who are shaking to the work. The working population is divided into main workers (those people who are working at least 183 days), marginal workers (less than 183 days) according to the 1981 census.

Table 2.11: Occupational Structure of Koch Bihar District in 2011 (Block-Wise)

Name of Blocks	% of Workers	Cultivators (in %)	Agricultural Labourer (in %)	Household Workers (in %)	Others (in %)
Sitai	45.67	41.96	44.92	1.67	11.45
Mathabhanga - I	44.94	47.24	31.21	1.71	19.84
Koch Bihar - I	41.21	23.01	32.37	5.44	34.34
Mekhliganj	41.12	48.22	34.04	1.7	16.03
Tufanganj - I	40.49	24.69	34.95	9.94	30.42
District	40.01	32.34	34.74	3.6	29.32
Tufanganj - II	39.87	28.7	33.82	5.77	31.72
Mathabhanga - II	39.79	34.25	39.06	2.64	24.05
Dinhata - I	39.73	30.49	39.07	3.64	26.8
Dinhata - II	39.69	33.51	51.06	1.34	14.09
Sitalkuchi	39.53	56.59	29.94	1.96	7.42
Haldibari	37.91	37.92	44	1.31	16.71
Koch Bihar - II	37.31	21.35	33.77	3.04	41.85

Source: Census of India, 2001 & 2011

The working populations are distributed unequally over the district. Sitai block has the highest percentage of workers (45.67%) followed by Mathabhanga-I (44.94) and Koch Bihar-I (41.21%). The minimum percentage of the working population found in the Koch Bihar-II (37.31 %), Haldibari (37.91%), Sitalkhuchi (39.53%). The maximum percentage of cultivators found in Sitalkhuchi block (56.59%) followed by Mekhliganj (48.5%). The agricultural labour maximum found in Dinhata-II block (54.06%) and the lowest is found in

Mathabhanga-I block. The household workers have a significant role on the district economy. It increases today. Tufanganj-I have the highest percentage of household workers like 9.94 percent (table 2.11).

Table 2.12: Number and Area of Holding by Size Class

Sl. No.	Block	Individual Holdings		Institutional Holdings		Total Holdings	
		Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
1	Koch Bihar-I	28501 (100)	25566 (99.9)	1 (0)	25 (0.1)	28502 (100)	25591 (100)
2	Koch Bihar-II	26496 (100)	23211 (100)	0 (0)	0 (0)	26496 (100)	23211 (100)
3	Dinhata-I	32126 (100)	24111 (100)	0 (0)	0 (0)	32126 (100)	24111 (100)
4	Dinhata-II	29459 (100)	30368 (100)	0 (0)	0 (0)	29459 (100)	30368 (100)
5	Haldibari	7084 (99.99)	4265 (99.84)	1 (0.01)	7 (0.16)	7085 (100)	4272 (100)
6	Mathabhanga-I	54436 (100)	48943 (99.99)	1 (0)	7 (0.01)	54437 (100)	48950 (100)
7	Mathabhanga-II	23118 (99.97)	17196 (97.9)	6 (0.03)	368 (2.1)	23124 (100)	17564 (100)
8	Mekhliganj	22205 (99.34)	15309 (88.41)	147 (0.66)	2006 (11.59)	22352 (100)	17315 (100)
9	Sitai	15789 (99.99)	11545 (99.92)	1 (0.01)	9 (0.08)	15790 (100)	11554 (100)
10	Sitalkuchi	41302 (100)	26736 (99.97)	1 (0)	8 (0.03)	41303 (100)	26744 (100)
11	Tufanganj-I	29004 (100)	30519 (99.97)	1 (0)	8 (0.03)	29005 (100)	30527 (100)
12	Tufanganj-II	13598 (99.99)	12287 (99.93)	1 (0.01)	8 (0.07)	13599 (100)	12295 (100)
13	District	323118 (99.95)	270056 (99.1)	160 (0.05)	2446 (0.9)	323278 (100)	272502 (100)

Source: Agricultural Census, 2010-11

There is a long history of relationship between migration and development (Garni, 2013). The above table is showing the block-wise distribution land holdings and number of households in Koch Bihar district. The land holding is divided into two categories viz., individual holdings and institutional holdings. The block Koch Bihar-II, Dinhata-I and II reveals all the households having individual holding while the district having overall 99.95 percent of individual holding covered 99.1 percentage of individual area. Institutional holdings were comparatively very less in the district. Rural households receiving remittances which having a

significant impact on landholdings (Durand and Massey, 2005).Household having large amount of land having higher propensity of migration (Van, 2005), although landless households also migrate to purchase land (Garni, 2013).

2.6. Conclusion:

In the conclusion of the district, we found that this district characterized by majority parts of flat and monotonous relief having waterlogged and flood-related problems. And the entire district is fulfilled by river-borne sand and silt. From the above study for the suitable physical set-up of the district developed agro-based human settlement. Generally, after independence of the country huge Bangladeshi immigrants came into this district which putting enormous pressure into the agriculture system of rural Koch Bihar district. According to Human Development Report, 2004, West Bengal the district ranked (HDI 0.52) in 11^{th} position out of all districts in Bengal which reveals the district is not well certain spheres of economy. The major findings are;

1. The population of district Koch Bihar is that being ruled by feudatory rulers under British regime, the state has attracted considerable number of immigrants from other places, including the neighbouring districts. Immediately after independence along with partition, this immigration rose to 1, 45,916 out of a total population of 6, 71,158 which is almost 21.75%. Migration has been a key element of social evolution.
2. As per Census 2011, Koch Bihar has recorded a 50.17% concentration of population under Scheduled Castes category. Ethnicity wise the most dominant population group in Koch Bihar district are the *Rajbanshis.* They form around 75.2% of Scheduled Castes population and 37.72% of total population in the state. Next comes the *Namasudras* who form 12.61% of Scheduled Castes in the district.
3. The study finds major alteration of agricultural land into the built-up area. There is also a significant reduction in vegetation cover in Koch Bihar district during the period. Urban expansion and population growth lead to a drastic change in land use/land cover.
4. The size of the population was more or less constant up to 1951. Within 50 years, the population only increased more or less 1 lakh. After 1951 the population increased very rapidly because of immigration from Bangladesh. After 1947, the partition of India, the district having an unprecedented rate of population growth was recorded

due to huge immigrants from East Pakistan (now Bangladesh). The debate have raised for illegal immigrants or 'refugees' but this cross border migration it refused that they are not refugees. Although from 1991 onwards growth rate has started declining.

2.7. References

AgricultureCensus of India, 2010-2011

Census of India, 2001 https://censusindia.gov.in/DigitalLibrary/TablesSeries2001.aspx

Census of India, 2011 https://censusindia.gov.in/DigitalLibrary/TablesSeries2001.aspx

Comprehensive District Agriculture Plan Under Rashtriya Krishi Vikas Yojana, Koch Bihar District, West Bengal. Retrieved July 23, 2020 from https://rkvy.nic.in/static/SAIDP/WB/For%20this%20Period(2017-18%20to%202019-20)/SAIDP-WB.pdf

Chaudhuri, H.N (1903).The Cooch Behar State and its Land Revenue Settlements Published by State Press of Cooch Behar, 1903

Directorate of Agriculture, Government of West Bengal, 2011

Bacci, M. L. (2018). A short history of migration. *John Wiley & Sons*

Basu, R. (2015). Land Tenures in Cooch Behar District, West Bengal: A Study of Kalmandasguri Village. *Journal*, *5*(1), 88-111.

Deng, J. S., Wang, K., Deng, Y. H., & Qi, G. J. (2008). PCA-based land-use change detection and analysis using multi temporal and multi sensor satellite data. *International Journal of Remote Sensing*, *29*(16), 4823-4838.

District Statistical Handbook 2013, Bureau of Applied Economics and Statistics, Govt. Of West Bengal. Retrieved July 23, 2020 from http://www.wbpspm.gov.in/publications/District%20Statistical%20Handbook

Durand, J., & Massey, D. S. (1992). Mexican migration to the United States: A critical review. *Latin American Research Review*, *27*(2), 3-42.

Garni, A. (2013). Land tenure, migration, and development: A Comparative Case Study. *Latin American Research Review, 48*(1), 133-154. Retrieved January 7, 2021, from http://www.jstor.org/stable/41811591

Ghoshal, S.C (1942). A History of Cooch Behar (From the earliest time to the end of Eighteenth Century A. D.) Published by State Press of Cooch Behar, 1942

Guilmoto, C. Z., & Rajan, S. I. (2013). Fertility at the district level in India: Lessons from the 2011 census. *Economic and Political Weekly*, 59-70.

Hunter, W.W (1876). A Statistical Account of Bengal, Volume X, Districts of Darjiling and Jalpaiguri and State of Koch Bihar, Published by Director General of Statistics to the Govt. of India, 1876

Islam, N. (2017). Socio-economic and Environmental Impact of Brick Kiln Industry in Tufanganj Block-I of Koch Bihar District, West Bengal-A Geographical Analysis. *Doctoral Thesis*, University of North Bengal, Darjeeling

Mazumder, D.D. (1977). West Bengal District Gazetteers: Koch Bihar, Govt. of West Bengal.

Miraj, A. (2018). Wetlands of Tufanganj and Koch Bihar Sadar subdivisions in the Koch Bihar District West Bengal geo environmental study. Doctoral Thesis, University of North Bengal, Darjeeling.

Official website of Koch Bihar district http://www.coochbehar.nic.in/

Prakash, A., & Gupta, R. P. (1998). Land-use mapping and change detection in a coal mining area-a case study in the Jharia coalfield, India. *International journal of remote sensing*, *19*(3), 391-410.

Rahman, A., Agarwal, S. P., Netzband, M., and Fasal, S (.2011). Monitoring urban sprawl using remote sensing and GIS techniques of fast-growing urban centres, India. *IFFF-Journal of Selected Topics in Applied Earth Observations and Remote Sensing*,4(1):56-64.

Rahman, M., & Van Schendel, W. (2003). 'I Am Not a Refugee': Rethinking Partition Migration. *Modern Asian Studies, 37*(3), 551-584. Retrieved July 23, 2020, from www.jstor.org/stable/3876610

Roy, R. (2009). Changing Pattern in Agriculture: A Case Study of Koch Bihar District. Doctoral Thesis, University of North Bengal, Darjeeling

VanWey, L. K. (2005). Land ownership as a determinant of international and internal migration in Mexico and internal migration in Thailand. *International Migration Review*, *39*(1), 141-172.

18th All India Livestock Census, Agriculture Implements & Machinery Fishery Statistics', West Bengal. Retrieved July 23, 2020 from https://www.pbgsbs.gov.in/sites/default/files/files/DISTRICTWISE-BREEDABLE-CATTLE.pdf