



# THE ASSAM GAZETTE

অসাধাৰণ

EXTRAORDINARY

প্ৰাপ্ত কৰ্তৃত্বৰ দ্বাৰা প্ৰকাশিত

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GOVERNMENT OF ASSAM  
ORDERS BY THE GOVERNOR  
DEPARTMENT OF HOUSING & URBAN AFFAIRS.

**ADDENDUM**

The 2nd June, 2022

**No. UDD (T)138/2022/9.**— In pursuance of modification of the Govt. Notification No. UDD(T) 138/2022/6 dated 16<sup>th</sup> March, 2022, published in Extraordinary Gazette Notification No. 220, dated 24<sup>th</sup> March, 2022, regarding notice for publication of the Draft Revised Master Plan for Kokrajhar, the Schedule Report and maps of the Draft Revised Master Plan is added and read as one and the same documents.

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Department of Housing & Urban Affairs,  
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## **1. INTRODUCTION**

### **1.1. Historical Background**

Kokrajhar town is the Headquarter of Kokrajhar district as well as the capital of Bodoland Territorial Area District (BTAD) and is situated on the eastern side of Gaurang River.

Kokrajhar was originally a part of the undivided Goalpara district. In 1957 it was curved out as a Civil Sub-division from the then Dhubri Sub-division of Goalpara district. Till then it was merely small town with a railway station. On 1st July, 1983 it was upgraded into a district. At that time, there were four Police stations viz. Bijni, Sidli, Kokrajhar and Gossaigaon with a total area of 4,065.88 Sq.Km. spreading from the river Manas in the east to the river Sonkosh in the west. In 1989, the district of Bongaigaon was curved out with about 40% area of Kokrajhar district. Later on, the Nayekgaon G.P. of Dhubri district with an area of 40.22sq.km was merged with this district. Again on 10th February, 2009 Chirang district was created by curving out parts of Kokrajhar district and some parts of Dhubri district were merged with Kokrajhar district. The present area of the district is estimated to be 3,169.22sq.km and that of the town is 125.78 sq.km.

In the year 1956 Kokrajhar town committee was formed to look after the various civic needs of the growing community and it got the status of Municipal Board in the Year 1970.

Kokrajhar was declared Sub-Division in the year 1957. Electricity came to Kokrajhar for the first time in 15th August, 1957. Kokrajhar College was established in the year 1959, B.T. College 1971, Law College and Commerce College in 1986 and Girls' College in 1989.

Kokrajhar was declared District in the year 1983, The Bongaigaon refinery and Petrol Chemical Complex established in the year 1972 came under Kokrajhar District. The Bongaigaon Thermal Power Station was established in the year 1975 at Salakathi. As a district Headquarter, number of Government and Semi-Government establishments

came into existence at Kokrajhar creating employment opportunities to a considerable extent and as a result people from outside have started migrating to Kokrajhar in search of job and economic opportunities.

The colourful Bodo community comprises the majority in Kokrajhar district. It also has a sizeable Rajbongshi and Santhal population. Issues relating to disparities across socio-religious communities have attracted much attention of the Government of India and have led to the growing realisation about the relative backwardness of the relative minorities. The result of one such situation is the formation of the BTAD which was created as a new political administrative region with four new districts viz. Kokrajhar, Chirang, Baksa and Udalguri after the signing of BTC accord between the Bodo Liberation Tigers (BLT) the then organisation spearheading the movement for separate Bodoland State, Assam Government and the Central Government on 10th February of the year 2003. The BTAD was created after the amendment of 6th schedule of Indian Constitution.

## 1.2. Location and Linkages

### 1.2.1. Geographical location

Kokrajhar district is located on the northern bank of the river Brahmaputra and on the eastern side of the river Gaurang, which is a perineal river and a tributary to river Brahmaputra. It is bounded by Tarang River on the eastern side. The Kokrajhar Master Plan Area lies roughly within the cardinal points 90°13' East to 90°20' East and 26°21' North to 26°29' North Latitude. It lies at a height of 61 meters approximately above mean sea level (MSL). The Kokrajhar district is surrounded by Chirang district on the east, Dhrubri district on the south, West Bengal State on the west and Bhutan hills on the north.

The vegetation of the district is characterized mainly by lush green forest and varieties of flora and fauna. Manas National Park stands out as the glaring example of this bio-diversified feature near the district. The climate of the district is sub-tropical in nature with warm and humid summer and also followed by cool and dry winter.

### 1.2.2. Climate

#### Rainfall:

*Table 1: Average Rain Fall in Kokrajhar for 2011 to 2015*

Month	Precipitation (mm)	Average Rainfall Days
January	11.1	1
February	13.6	2
March	53.74	3
April	252.03	10
May	646.86	20
June	698.40	23
July	491.09	18
August	393.21	15
September	176.11	12
October	22.88	4
November	1.56	1
December	11.1	1

*Source: Water Resource Department, BTC, Kokrajhar*

May to July receives the maximum amount of rainfall i.e. an average of 612.12mm followed by April, August and September.

**Temperature:***Table 2: Temperature Data of Kokrajhar*

Month	Average High Temp (Celsius)	Average Temp(Celsius)	Low
January	23	11	
February	26	13	
March	30	16	
April	31	20	
May	32	23	
June	32	25	
July	32	26	
August	33	26	
September	32	25	
October	30	22	
November	28	17	
December	25	13	

*Source: Meteorological Dept.*

Despite of the fact that June to August month receives maximum rainfall, Kokrajhar faces the maximum temperature during these months only and the least during January.

**Humidity:**

Kokrajhar has a warm humid climate and during June to July it faces an average humidity of 80 -90 % making it very uncomfortable.

### 1.2.3. Soil

The soil is mostly alluvium with very high erodibility factor. Due to massive change of top cover of soil and rainfall there takes place a lot of erosion. Especially around the banks which are prone to heavy mass dips the Government has taken many initiatives. They are as follows:

**Embankment for protection of town:** There is an Embankment of 5.21 KM long constructed on the Left Bank of the Gaurang River for protection of Kokrajhar Town from flood and erosion. This length of the embankment covers the major area of the Kokrajhar town on the west side of the town. The embankment is most important part for protection of the town from flood and erosion. The embankment was constructed in 2011-12 and has become most important project for protection of the Kokrajhar town from flood and erosion.

**Embankment on the right bank:** Embankment is constructed by DRDA department for the protection of flood and erosion for a distance of 1.70 km on the right bank of the Gaurang River.

**Deflectors:** There are 37 deflectors along with the embankment of 5.21 KM on the left bank of the Gaurang River. These deflectors help in protection of erosion on the embankment and make a diversion of water flow direction. The deflector is made with boulders and iron wire net.

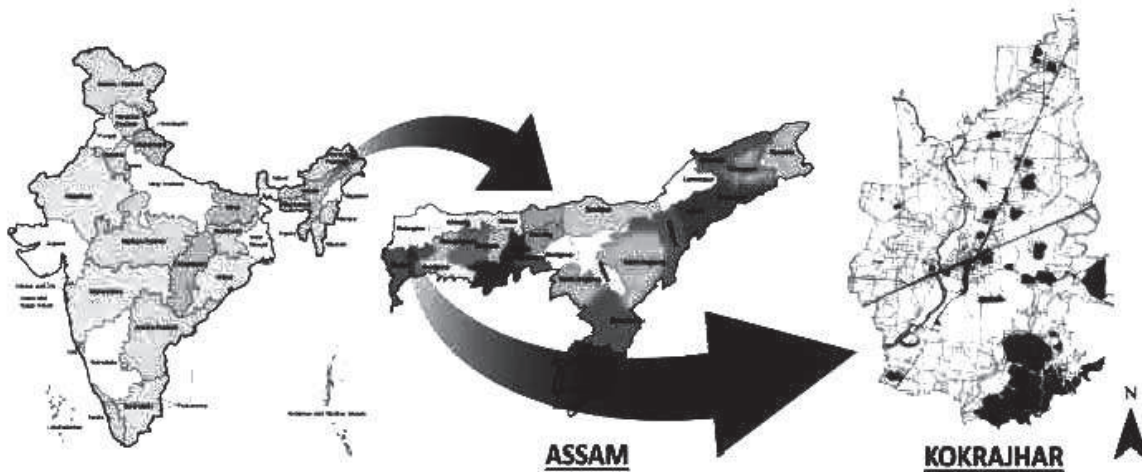
**RCC Porcupine Screen:** There are 4599 nos. of RCC Porcupine screens along with the embankment on the left bank of the Gaurang River for protection of erosion and flood in the town. The construction of porcupines on the river bank is working very well and protecting the river from the erosion since 2011-12 after its construction. Each porcupine consists of 6 members.

**Switch Gate:** There are two switch gates on the east embankment of the Gaurang River for allowing rain and waste water in to the Gaurang River from the Kokrajhar town areas. The switch gate is closed when the water level of the Gaurang River is higher than the level of water flowing from the town so that the water does not go to the town to create flood. This works as a good measure to protect flood in the Kokrajhar town.

*Source: Water Resource Department, BTC, Kokrajhar*

### 1.2.4. Regional Linkages

*Figure no.1: Regional Location Key Map*



The town is well connected to the country and other parts of Assam both through B.G. line and other road transport modes. There are two National Highway N.H. 31C and N.H. 31B from three sides one towards Kharigaon on the North, Bahalpur towards East and Bilasipara towards South which connects the town to the rest of Assam. The kingdom of Bhutan is intricately linked with the district of Kokrajhar in many vital aspects of life of the people living both in the Bhutan hills and the plains of Kokrajhar. NH 31C links Kokrajhar to the Bhutanese town of Gelephu and is just across the international boundary there is substantial movement of the people across the international border for the purpose of business and tours.

### 1.3. Local Administration

Post British rule in the year 1956 Kokrajhar town committee was formed to look after the various civic needs of the resident growing community and it got the status of

Municipal Board in the Year 1970. Simultaneously with the efforts of the Town and Country Planning Department there has resulted in a manifold rise in its population and development. The Kokrajhar Development Authority was established in the year 2008 for taking care of various development activities.

The existing Master Plan of Kokrajhar consists of 60 revenue villages and 10 wards.

**Map no.1: Map showing revenue villages**



Source: Town and Country Planning Dept.

**Table 3: Revenue villages Names**

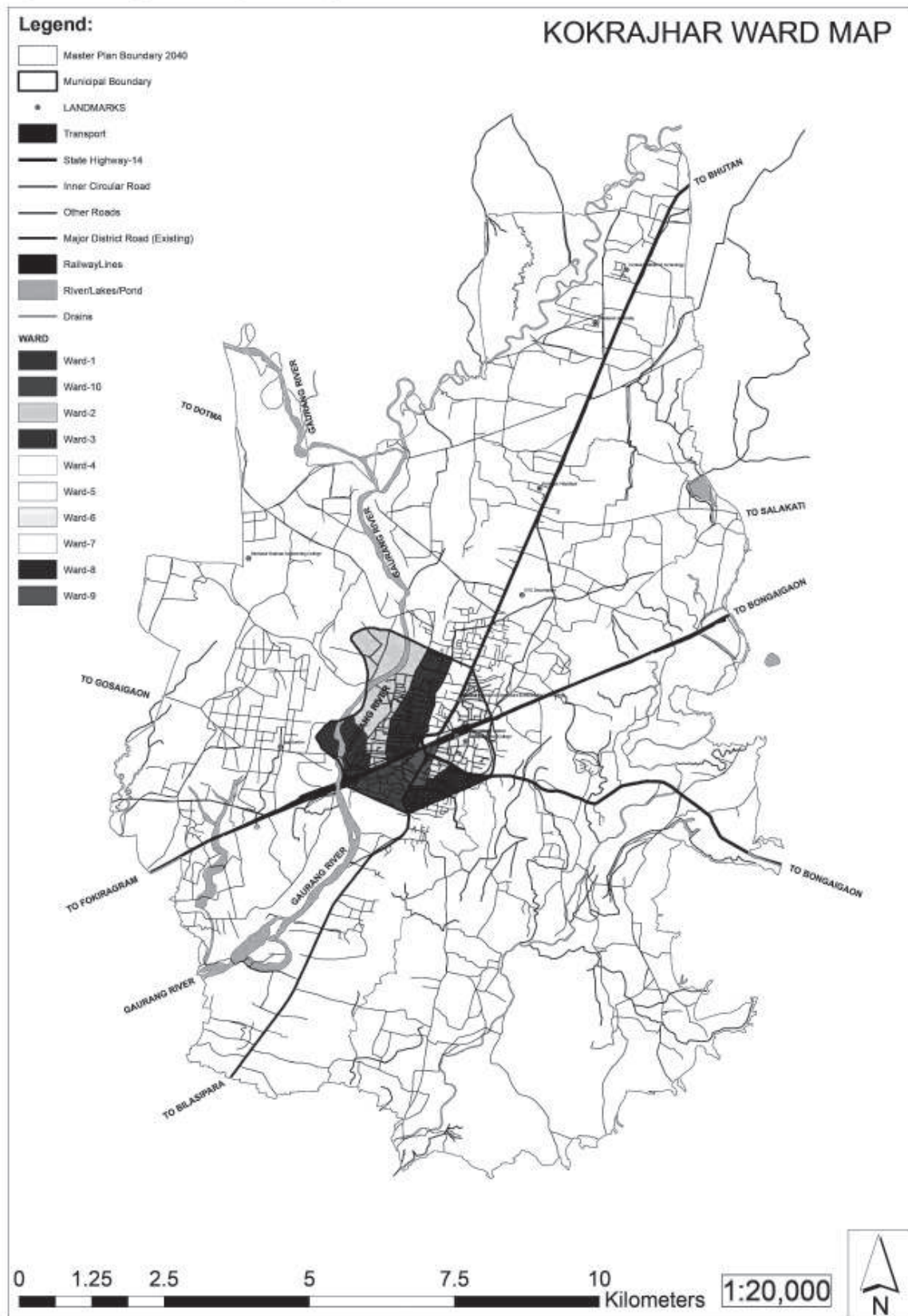


1	Kathalguri No.1	31	Harinaguri Part-1
2	Adabari	32	Harinaguri Part-2
3	Balagaon	33	Hatimatha
4	Balajan	34	Jamadarpara
5	Batabari	35	Joybhum
6	Belguri	36	Joypur
7	Bhatipara	37	Kamalachara Chesapani
8	Bhodiaguri	38	Kashipara
9	Bijulibari	39	Kathalguri
10	Boro Adabari	40	Katrigasa
11	Boro Bhatarmari	41	Khargaon
12	Boro Gendrabil	42	Kokrajarh Baghicha
13	Boro Singimari	43	Kokrajarh Gaon
14	Chandamari	44	Kunguri
15	Chandrapara	45	Khunthaibari
16	Choraikhola Jungal Block	46	Magurmari
17	Choraikhola Part-1	47	Majpara
18	Choraikhola Part-2	48	Mokarapara
19	Choto Shingmari	49	Molandubi
20	Deoraighat	50	Narabari

21	Deborgaon	51	Rainadubi
22	Dhupguri	52	Rangalikhata
23	Dimolgaon	53	Chesapani
24	Diabari	54	Shyamthaibari
25	Dobgaon Part-1	55	Shamugaon
26	Dobgaon Part-2	56	Subaijhar
27	Gendrabil	57	Thuribari
28	Habrubari	58	Titaguri Part-1
29	Halowadhhal Part-1	59	Titaguri Part-2
30	Haloawdhhal Part-2	60	Taraibari

*Source: Town & Country Planning, Kokrajhar*

Map no.2: Map showing Municipal Wards



Source: Town and Country Planning, Kokrajhar

Table 4: List of Wards

1	Kokrajhar ward No.1	The ward numbers from 1 to 5 are situated on the north side of the railway lines
2	Kokrajhar ward No.2	
3	Kokrajhar ward No.3	
4	Kokrajhar ward No.4	
5	Kokrajhar ward No.5	
6	Kokrajhar ward No.6	The ward numbers from 6 to 10 are situated on the south side of the railway lines
7	Kokrajhar ward No.7	
8	Kokrajhar ward No.8	
9	Kokrajhar ward No.9	
10	Kokrajhar ward No.10	

*Source: Town & Country Planning, Kokrajhar*

#### 1.4. Planning Efforts

In order to deal with rapid urbanization and related urban issues, the State government started preparing a Master Plan for Kokrajhar in 1988 under Section 10 of the Assam Town and Country Planning Act, 1959. The Master Plan for Kokrajhar constituted 46 revenue villages and an area of 85.35sq.km and had a perspective for 2011 and was finally published in the year 2007.

In exercise of the powers under section 14 and sub-section (2) of section 9 & 10 of the Assam Town and Country Planning Act, the Revised Master Plan for Greater Kokrajhar is to be prepared by the Town and Country Planning Organisation. The Revised Master Plan so prepared will constitute 60 revenue villages and 10 wards and aims towards a sustainable and planned growth.

## **2. VISION AND GOALS**

### **2.1. Need of the Revised Master Plan of Greater Kokrajhar**

In urban India it is predominantly seen that the growing concentration of people in urban areas has led to problems of land shortage, housing shortfall and congested transit and has also severely stressed the existing basic amenities such as water, power and open spaces of the towns and cities. Urbanisation has also led to dire situations like people increasingly living in slums and squatter settlements and has deteriorated the quality of life and environmental conditions of cities.

Kokrajhar town being the Headquarter of Kokrajhar district as well as the capital of Bodoland Territorial Area District (BTAD) is growing in size and population rapidly. It is very important to usher an era of planned development. Any development must enhance the role of the town in the region.

A clear vision is required for the development of a town to remind itself about its function, identity and future opportunities. The Revised Master Plan for Greater Kokrajhar shall aim to make the best use of the physical assets of the entire geographic planning area to minimise the adverse impacts of urbanisation and must lead to an inclusive sustainable development to gain social, economic and environmental benefits. The plan shall be comprehensive in nature that it encompasses all the functions that makes a community work, including land use, transportation, infrastructure, housing, socio-economic, tourism, environment and recreation.

## 2.2. Vision

To develop Kokrajhar as an educational hub, an administrative headquarter of Bodoland Territorial Area Districts (BTAD) and meet the infrastructural needs of the fast growing urban populace without having negative impacts to its social and environmental status.

## 2.3. Goals

- To improve the quality of life of the people of Kokrajhar through facilitation of infrastructure.
- To promote inclusive growth.
- To promote eco-tourism.
- To improve the socio-economic status.

# 3. DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

## 3.1. INTRODUCTION

Demography is the study of human population dynamics. It encompasses the study of the size, structure and distribution of population and also the population trend over time due to births, deaths, migration and aging.

The study of demographic attributes is very important for the study of socio-economic structure of the city. It helps in estimating the dynamics and growth of demand. All the other planning aspects depend on the study of demographic, socio-economic characteristics and employment aspects, and only after the analysis of this study the required amenities can be calculated. Thus, it becomes a focal theme for any settlement study. The data required for analysis is collected from various sources ranging from secondary sources of district level to primary household survey.

The state of Assam is predominantly rural in character with only 8.87% urban population in 1971 which has increased to 14.1% urban population in 2011 and Kokrajhar district is also not an exception. The district was predominantly rural with only 3.53% urban population of its total population in 1971 which has increased to

6.19% of urban population in 2011 and it indicates that the urbanisation is increasing in both Kokrajhar as well as in Assam due to rise in industrialization or business activities in the district.

### 3.2. Population Growth: Kokrajhar Area

Besides being an administrative centre, Kokrajhar is also important for trade and commerce. It was mainly important for timber before the BTC accord. Kokrajhar contains many offices as the capital of BTAD and the head quarter of Kokrajhar district like the Secretariat of BTC, offices of Directors as Council Head of Departments for different line departments. The Kokrajhar town has many offices and educational institutions like Central Institute of Technology, Kokrajhar Government College, Bineswar Brahma Engineering College, Bodoland University, telephone exchange, 200 bedded Civil Hospital, B T. College, General Colleges, I.T.I and other facilities required for capital and the district Head Quarter town.

The Bongaigaon Thermal Power Station (BTPS) presently known as National Thermal Power Corporation (NTPC) at Salakathi which is very close to Kokrajhar, has created same impact for growth & development of the town.

*Table 5: Growth of Population in Kokrajhar Master Plan Area: 1961 to 2011*

Year	Population in Municipality area	Decadal Growth (%)	Master Plan area (excluding Municipality)	Decadal Growth (%)	Total Master Plan area	Decadal Growth (%)
1961	9,489	-	15,134	-	24,623	-
1971	17,060	79.79%	22,315	47%	39,375	60%
1988	26,775	56.95%	34,033	53%	60,808	54%
2001	31,164	16.39%	52,484	54%	83,648	38%
2011	34,136	9.54%	65,689	25%	99,807	19%

*Source: Statistics & Economics Department, BTC, Census of India, Assam and Town & Country Planning*

### 3.3. Population Density

Apart from the Municipal Area, the planning area as a whole is thinly populated. The gross density of population of Kokrajhar Municipal area in 1971 was approx. 1977 p/sq.km. and in 1988 was 3212 p/sq.km. while that of planning area was 741 p/sq.km during 1988. Now the population density of Municipality area is increased to 3784 p/sq.km. in 2001 and 4144 p/sq.km. in 2011 while the population density of whole Master Plan Area is 665 p/sq.km. in 2001 and 793 p/sq.km. The population density in Kokrajhar Master Plan Area excluding Municipality is 446 p/sq.km. in 2001 and 559 p/sq.km. in 2011. This indicates that the density of population is increasing in all the areas.

*Table 6: Density of Population: Kokrajhar Master Plan Area*

Area	2001			2011		
	Area in sq.km	Population	Approx. density (p/sq.km.)	Area in sq.km	Population	Approx. density (p/sq.km.)
Total Kokrajhar Master Plan Area	125.78	83,648	665	125.78	99,807	793
Kokrajhar Municipality Area (KMA)	8.24	31,164	3,784	8.24	34,136	4,144
Kokrajhar Master Plan Area (Ex. Municipality)	117.55	52,484	446	117.55	65,689	559

*Source: 2001 & 2011 figure from census of India, Assam*



### 3.4. Population Estimates

The population of whole Kokrajhar Master Plan Area, Municipality area and Master Plan Area excluding Municipality area is estimated by using the Arithmetic, Geometric and Exponential methods and the mean of the values are considered as estimated value of population. The estimates are shown in the table 7.

*Table 7: Population Estimates for Kokrajhar Master Plan Area: 1961 to 2041*

Year	Population in Municipality area	Decadal Growth (%)	Master Plan area (excluding Municipality)	Decadal Growth (%)	Total Master Plan area	Decadal Growth (%)
1961	9,489	-	15,134	-	24,623	-
1971	17,060	79.79%	22,315	47.45%	39,375	59.91%
1988	26,775	56.95%	34,033	52.51%	60,808	54.43%
2001	31,164	16.39%	52,484	54.22%	83,648	37.56%
2011	34,136	9.54%	65,671	25.16%	99,807	19.32%
2021	36,806	7.82%	78,330	19.24%	1,15,136	15.36%
2031	39,302	6.78%	91,176	16.40%	1,30,479	13.33%
2040	41,514	5.67%	1,03,755	14.04%	1,45,293	11.52%
2041	41,777	6.30%	1,05,399	15.60%	1,47,176	12.80%

*Source: Statistics & Economics Department, BTC, Census of India, Assam and Town & Country Planning and analysis by author.*

The population of Greater Kokrajhar Master Plan Area is estimated and found to be increasing from 99,807 in 2011 to 1,15,136 in 2021, 1,30,479 in 2031, 1,45,293 in 2040 and 1,47,176 in 2041.

### 3.5. Sex Ratio

The sex-ratio in Assam in terms of Females/1000 males is 958 whereas the sex-ratio in Kokrajhar District is 959. Similarly, the sex-ratio in total Kokrajhar Master Plan Area is 957 and municipality area is 943. It is seen that almost in all the regions, the sex-ratio is same. This indicates that the social life of the area is stable.

*Table 8: Sex Ratio of Kokrajhar*

Area	2011		Females/1000 males
	Male	Female	
Assam	15,939,443	15,266,133	958
Kokrajhar District	452,905	434,237	959
Kokrajhar Master Plan Area (Total)	50,990	48,817	957
Kokrajhar Municipality Area	17,567	16,569	943
Kokrajhar Master Plan area (Excluding Municipality)	33,423	32,248	965

*Source: Census of India, Assam and Statistics & Economic Dept.*

## **4. ECONOMIC BASE AND WORK AREAS**

### **4.1. Introduction**

Economic Base constitutes businesses that generate employment in a community or a geographical area and all the major industries within a geographic market area that provide employment opportunities essential to support the community. Information about an area's future population is incomplete without a parallel understanding of the local economy that largely shapes its future.

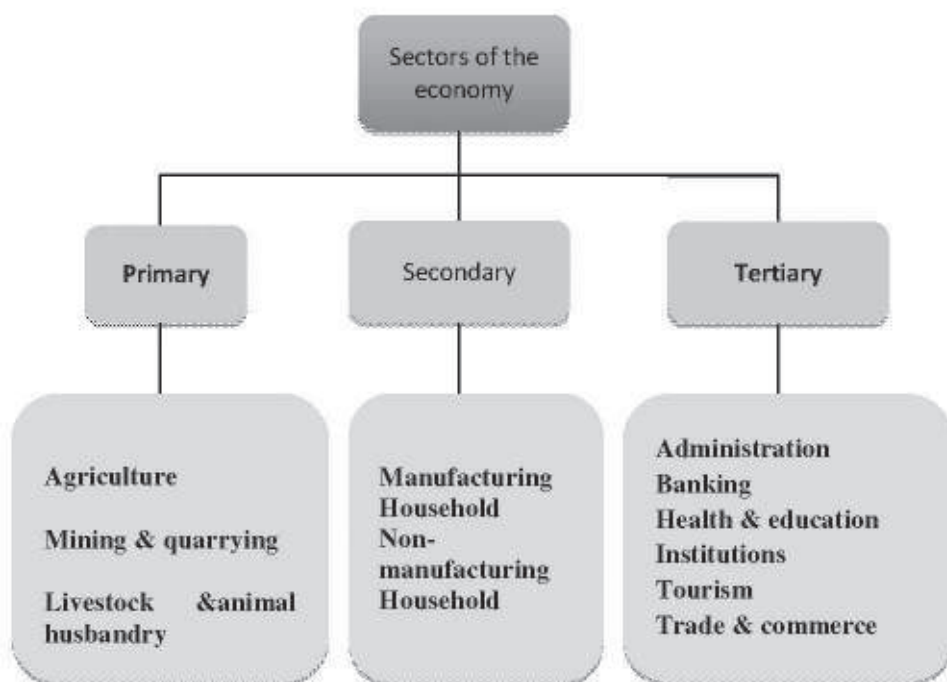
Presently, the economy depends mainly on secondary sector (i.e. manufacturing industries). The leading economy sector, secondary sector provides 2% of employment to the total working population in Kokrajhar Master Plan Area (Table 9). This constitutes a very small contribution to the economic growth of the local area. Also being an administrative headquarters it caters to the needs of the entire region and these administrative and institutional activities have contributed to the increase in the volume of trade and commerce. The local economy is passing through a major transformation, from agrarian to secondary and tertiary sector.

### **4.2. Vision**

The socio economic base and work areas establishments to be developed in properly demarcated land areas with beautiful front side appearances of the establishments within the town or city. All the trade and commercial activities to be carried out within the properly developed commercial house buildings that are supported and developed by the Government.

### **4.3. Sectoral Composition**

All activities relating to production, consumption and exchange of goods are called economic activities. On this basis the economic activities are divided into primary, secondary and tertiary sector which are shown as below:



*Table 9: Economic sector of Kokrajhar Master Plan Area*

Sector	Year
	2011
Primary	13%
Secondary	2%
Tertiary	31%
Non-worker	55%
Total	100%

Source: Census of India, 2011

#### 4.4. Major Work Areas –Trade and Commerce

Trade and commerce have played an imported role in sustaining the economic base of the urban centres as well as rural growth centres.

The business activities in Kokrajhar have not developed for a particular trade in a particular area but have spread widely. The major commercial areas have developed along the Kokrajhar-Bilasipara and Kokrajhar-Karigaon Road, Station Road and Road towards Railway level crossing. Commercial activities are gaining momentum along R.N. Brahma Road also. The rise in collection of commercial taxes indicates the increasing of commercial activity at Kokrajhar. The main item of trade and commerce are timber, Bamboo, Banana, Jute, Master seed, Eri, cotton, etc.

The whole-sale trade in the town is mixed with retail trade and no specific commercial area is dealing in this trade separately. The area coming under whole sale trade is quite nominal.

There are many shops at Kokrajhar which are growing. The retail activities are mostly concentrated on both side of the road within 1(one) km periphery of the railway station. The shopping activities are mainly concentrated on the southern side of the Railway station. Retail trade centres have developed haphazardly in the town along the major roads and this has created lots of problem. In order to facilitate the daily needs of house hold goods it is necessary to develop the retail centres at convenient places throughout the planning area.

**Local Markets:** There are the some important local market places in Kokrajhar town.

**Boro Bazar:** Boro Bazar is an everyday open marketing place of Kokrajhar town on the south side of the railway line. Where people use to go for buying their everyday need substances, it is just 0.6 km and 0.1 km away from Kokrajhar railway Station and Kokrajhar Police Station respectively. The most common substances found in Boro Bazar are as bellow:

- i. Green Vegetables, ii) Fruits, iii) Meat and fishes, iv) Local milk, v)  
Grocery items

Infrastructures in the Boro Bazar are consistently poor. Most of the people sell their goods in open places where market sheds are not systematically constructed and some of the constructed market sheds are also not good condition.

Rotten garbage and inadequate sewer systems in the market place has totally destroyed the hygienic condition and beautiful scene of the market place. Garbage and rotten features are just lying here and there in the market. The major causes of those reasons are may be for insufficient numbers of dustbin, lack of well market shed construction, lack of proper system of collecting garbage and rotten feature thrown by people.

**Bajwi Bazar:** Bajwi Bazar is one of the important vegetables and meat marketing place in the northern zone of the Kokrajhar Town. It is located at 1.2 km away from Kokrajhar Railway station. The market is running on a place of old petrol pump. Since petrol pump has been closed for long time; people started selling vegetables and meat at that place. Hence, it is said to be the non-permanent marketing place. That's why; neither there is any fixed market shed nor any good infrastructure.

Bajwi Bazar contains more than 50 shopkeepers out of whom 30 are vegetable sellers and fruits sellers and rest others are meat and fish sellers. The bazar is more crowded during morning and evening time. This market starts at the morning 7AM and open till night 9PM.

**Daily Market:** Daily Market is another important marketing place in Kokrajhar Town. This market is located at just about 100 meters away from Kokrajhar Railway Station. The market is popular for cloth stores as well as green vegetables, Fruits and meat availability in the southern zone of the Kokrajhar town. The vegetable, fruits and meat markets are open only in the evening time and the rest markets like cloth store etc. are open for a whole day except local holiday on Saturday.

**Shantinagar Bazar:** This bazar is located on the north-west zone of the Kokrajhar town. This is just near of the DC office of the Kokrajhar district which is 100 meters away from Shantinagar Bazar. The market is like a linear type market because all shopkeepers use to sell their goods on the footpath road side of the main road. It means there is no any permanent market shed in the bazar for vegetables, fruits, milk, fish and meat. But some grocery and others markets have their own permanent houses. That's why they can open their market for the whole day but others like vegetable seller and meat sellers etc. are available in the evening time only.

There are no good shopping Centres at Kokrajhar. Suitable location within the planning area should be earmarked for a few shopping centres catering to the needs of all the surrounding villages and the town.

#### 4.5. Industries

Industry can be defined as economic activities concerned with the processing of raw materials and manufacture of goods in the factories. As per Industrial & Investment Policy of Assam, 2014;

Integrated Infrastructure Development Centre (IIDs) is under construction at Serfungguri (Kokrajhar). For institutional support for R&D and HR Development the centre in Kokrajhar is Kokrajhar University.

**Industrial infrastructure:** Adequate infrastructural facility is considered as essential pre-requisite for industrial development. It is proposed to create suitable industrial infrastructure in the state by setting up of new Industrial Estate /Area/ Parks, etc in the state through the Government agencies as well as through Public Private Partnership (PPP), wherever possible. The Government has taken steps to update the Land Bank for building such industrial Infrastructure in future.

**Development of Micro & Small Industries:** The importance and contribution of the Micro & Small sector to the economic growth and prosperity is well established especially to induce inclusive growth. The role of MSE's in terms of employment generation, upholding the entrepreneurial spirit and innovation has been crucial in fostering competitiveness in the economy. It is also proposed to develop Traditional Industries in the state through special package. Government will put thrust on development of this sector and take up various programmes to build a vast pool of skilled and semi-skilled personnel within the State.

**Medium and Large Industries:** Medium and Large industries have significant potential in the State because of availability of Raw materials like Hydrocarbon, Coal, Limestone, etc. Government will provide all possible support for setting up of medium and Large Industries in the State.

**Service Sector:** The State Government recognizes the immense contribution of the Services sector to the economic growth of the State. This sector has immensely contributed in employment generation in the State. Government will continue to facilitate the growth of Services sector in the State.

*Table 10: Types of industries and number of units*

Sl. No.	Type of Industries	No. Of Units
1	Weaving	0
2	Mining Based industries	0
3	Food products & other food products	6
4	Hosiery & garments	5
5	Wood products	4
6	Chemical Product	0
7	Textile	12
8	Repair & Service	10
9	Manufacturing	21
10	Health / Medicine	2
	<b>Total</b>	<b>60</b>

*Source: DICCC, Kokrajhar (Regd. Since 2008 to 2016)*

## 4.6. Proposals

### 4.6.1. Infrastructure

- Having 55% of non-working population, schemes and programme are to be provided to safeguard the interest of the non-worker class of locals. Apart from cultivation of land other sources of employment shall be provided to ensure their



employment, help them earn more. With the upcoming Thermal Plant at Salakathi more and more people must be trained to enrol in.

- Vocational training institutes imparting skills in various fields such as education, to help locals/ marginal workers in skill development should be built.
- Also if the town develops in tourism industry skill development programs necessary to meet the requirements of tourism industry.
- Programmes to ensure maximum children receive higher education to create a pool of well-educated population to meet the future job requirements.

#### 4.6.2. Functional Linkages

- The functional relationship with its surrounding region has to be improved. It has various other functions like schools, colleges, mandi, hospital, industry, crematorium major transport node etc., for which the whole surrounding villages and smaller towns could stay dependent. If we study the interdependency of Kokrajhar with its surroundings and also the movement of goods and people we will have some idea about the functional linkages.
- The interdependence of the surroundings areas of Kokrajhar could be improved in three ways: Daily, Weekly, and Monthly. In the daily interaction on the town mainly depend on the job purpose including the Education purpose and Job purpose. As the city is well connected by the road networks and also the headquarter of BTC it is easy to interact with the city. In the Weekly interaction the town deals with the primary business and wholesale business. In another case it highly includes the medical purpose. Monthly interaction takes place during the major part of harvesting period, exporting raw materials for the industries present here.

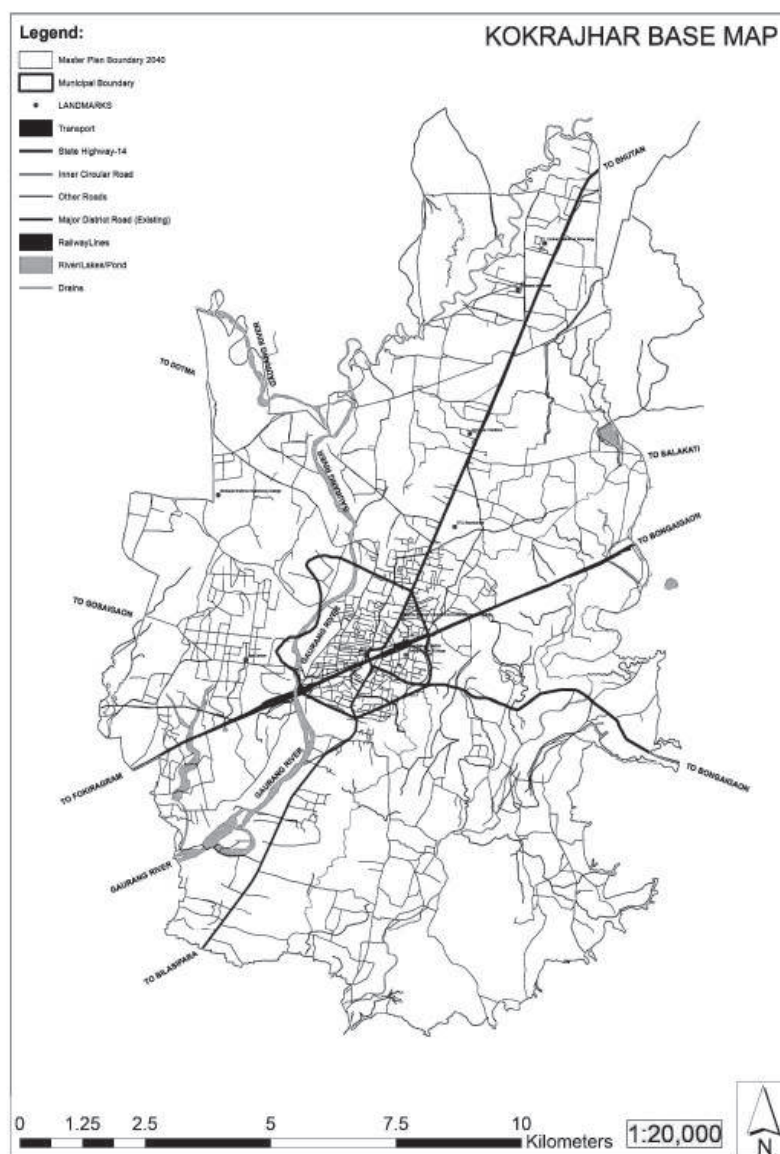
## 5. TRANSPORT

### 5.1. Kokrajhar Transport System

#### 5.1.1. Vision

The city roads to be beautiful, wide, clean, green, bright at night, pollution free, noise free with proper lane marks, proper signals, proper labels, and proper boundaries and without potholes, garbage, sewage, soils, stones, animals and traffic congestions.

*Map no.3: Road Networks of Kokrajhar Planning Area*



*Source: PWD Dept. and Primary Survey*



1. Kokrajhar Karigaon Road	From Karigaon side (Incoming)	3821	1020	10-11 a.m.	436	180	616	71%
				3.30 - 4.30 p.m.	583	92	675	86%
	To Karigaon road side (out-going)	4478	1313	10-11 am	504	262	766	66%
				3.30 - 4.30 p.m.	690	88	778	89%
2. Kokrajhar Bahalpur Road	From Bahalpur & Harinaguri side (Incoming)	900	319	10-11 a.m.	130	59	189	69%
				3.30 - 4.30 p.m.	110	26	136	81%
	to Bahalpur & Haringuri side (out-going)	776	240	10-11 am	117	34	151	77%
				3.30 - 4.30 p.m.	90	30	120	75%
3. Kokrajhar Basugaon Road	From Salakati Basugaon side (Incoming)	195	98	10-11 a.m.	25	14	39	64%
				3.30 - 4.30 p.m.	27	12	39	69%
	to Salakati Basugaon side (out going)	139	143	10-11 am	38	14	52	73%
				3.30 - 4.30 p.m.	47	24	71	66%
4. Kokrajhar Bilasipara Road	From Bilasipra side (Incoming)	2194	1478	10-11 a.m.	245	183	383	64%
				3.30 - 4.30 p.m.	340	256	596	57%
	To Bilashipara side (out- going)	1845	1290	10-11 am	228	109	337	68%
				3.30 - 4.30 p.m.	264	235	499	53%

5. Kokrajhar Dotma Road	From Dotma side (Incoming)	1260	109	10-11 a.m.	223	21	244	91%
				3.30 - 4.30 p.m.	113	8	121	93%
	To Dotma side (out-going)	1339	169	10-11 am	175	21	196	89%
				3.30 - 4.30 p.m.	182	19	201	91%
6. Kokrajhar Fakiragram Road	From Dotma side (Incoming)	844	158	10-11 a.m.	118	24	142	83%
				3.30 - 4.30 p.m.	107	18	125	86%
	To Dotma side (outgoing)	518	176	10-11 am	70	26	96	73%
				3.30 - 4.30 p.m.	68	21	89	76%

Source: Physical survey of traffics flow

#### 5.1.4. Road Network Characteristics

There is no established pattern of form of road network in Kokrajhar. Except few major roads like Kokrajhar-Karigaon Road, Kokrajhar-Balisapara Road, Kokrajhar-Basugaon Road and Kokrajhar-Bahalpur Raod, other roads are coming up in on organic way without any consideration of hierarchy. In addition to this, improper geometrics and poor maintenance has made the level of service very poor.

The Kokrajhar-Bahalpur Road & Kokrajhar-Karigaon Roads are the busiest road carrying both regional and local traffic having vehicle parking on the road side within the town. The maintenance of roads is not up to the mark on the Kokrajhar - Bahalpur road as there are presently potholes and the width of the roads is very small with two lanes. The conditions of the Kokrajhar – Kharigaon road are seen as well maintained after the formation of BTC which is connecting the National High way 31 (C) to Kokrajhar town. The other major roads are Kokrajhar-Bilasipara Road and Kokrajhar-Basugaon Road –via- Salakati. The Kokrajhar – Bilasipara road is seen as wide within the town but its width is very small once the road goes beyond the town. This road is crowded by parking of heavy vehicles as well as small vehicles thereby creating a busy road.

Kokrajhar-Karigaon Road is connected to National Highway No.31C at Karigaon which is 19km North from the town and Kokrajhar-Bahalpur Road connects National Highway No. 37 at Bahalpur which is 24.5km.

Almost all the roads within the town are very narrow and due to the lack of drainage facilities some of the roads get flooded during rainy season creating maintenance and traffic problems.

#### 5.1.5. Road Intersections/Level crossing

There are a number of defective road junctions which not only retard the speed of the vehicle but also pose as constant danger for road accidents.

The road junction (near Kokrajhar Girls' School) between R.N.B. Road & Hospital Road is one of the defective road junctions. The faulty road junctions are near Pragati-Bhavan, in front of Kokrajhar Boy's Higher Secondary School, near main Railway Gate and Dada-Bhai Hotel and near Circuit House.

The Broad Gauge line passes through the centre of the town and hence there are quite a number of level crossings. The most critical level crossing is in front of D.C.'s court Building. However, the presently closed railway road crossing near the minibus stand should be opened at least for rickshaw pullers, Thellas and pedestrians. There is a great demand of this level crossing for small and slow moving vehicles. There are quite a number of other level crossings but these do not create such critical problems.

There is another faulty junction across the over-bridge and in front of the Assam Oil which can be converted into a roundabout for quicker and easy movement of vehicular traffic.

#### 5.1.6. Traffic Characteristics

A comprehensive study on traffic characteristics is necessary to evolve a suitable and long time solution. However a preliminary study comprising volume study composition of traffic is done to get an idea about this. The volume study depicts that the peak period is not uniform all throughout the town. It is seen that p.c. of fast moving vehicle is much higher than the slow moving vehicles. Of course the survey was conducted during the period from 9.00 AM to 4.30 PM which is the time roads get busy with vehicles playing on them.

Among all the roads the Kokrajhar- Karigaon road is showing highest number of traffic as because this is the major and the shortest linkage with the N.H. way-31C. The next busy road is linkage with Bilashipara. This is the only road which catering the need of the people living southern side of the town. East-West axis is catered mainly by railway.

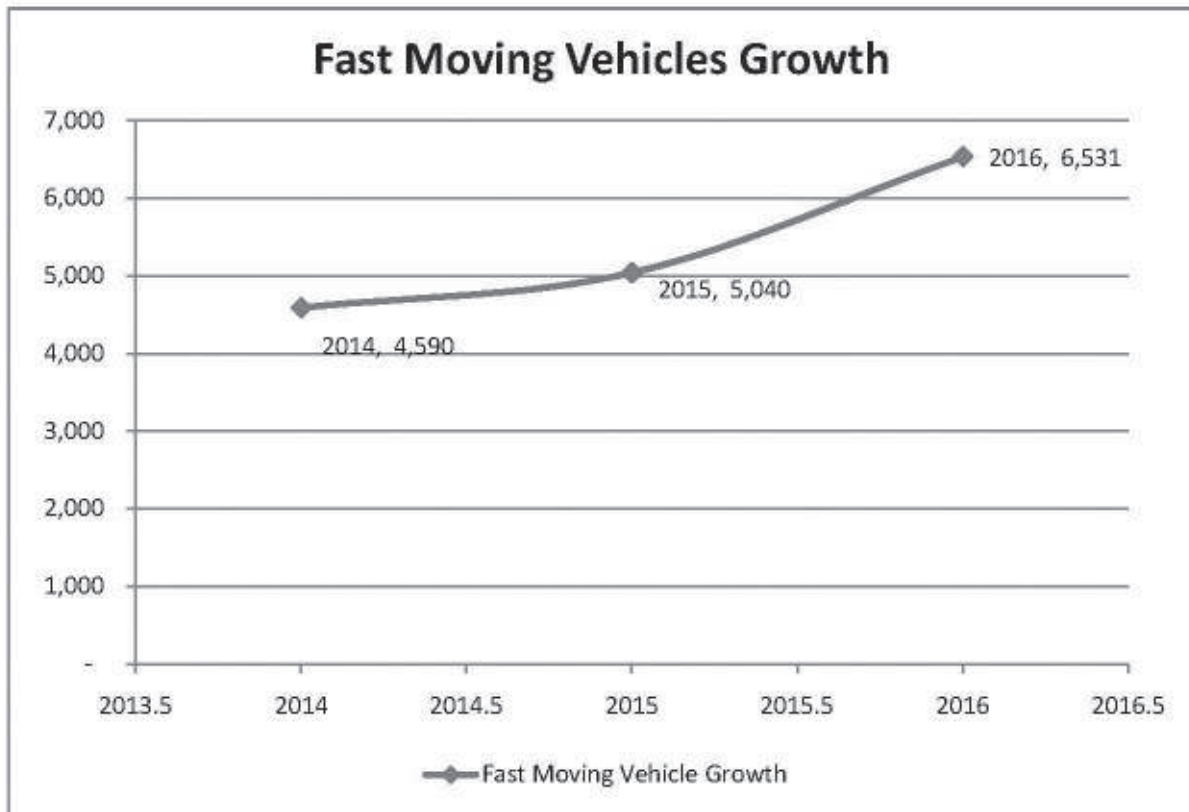
The registration of vehicles in Kokrajhar is increasing as per the record received from District Transport Office. The following table shows details of fast moving vehicles registered in DTO, Kokrajhar for last three years 2013-14, 2014-15, & 2015-16. Therefore there is an immediate need to improve road network as well as other terminal facilities to cope with the growing demand.

*Table 12: Growth of fast Moving Vehicles in Kokrajhar District*

Year	Heavy Vehicles	Medium Vehicles	Jeep/ Cars/ Cabs	Tractor	Auto Rickshaw	Scooter/ M.Cycle	Govt. Vehicle & Other	Total
Opening Balance	1,107	1,362	3,649	613	1,013	22,166	836	30,746
2013-14	17	153	515	129	187	3,536	53	4,590
2014-15	48	115	442	92	246	4,041	56	5,040
2015-16	36	159	611	145	350	5,093	137	6,531
Progressive Total as on 31th Mar'16	1,208	1,789	5,217	979	1,796	34,836	1,082	46,907
On road vehicles as on 31th Mar'16	1,016	1,420	4,565	365	2,003	29,899	960	40,228
Off road vehicles	192	369	652	614	(207)	4,937	122	6,679

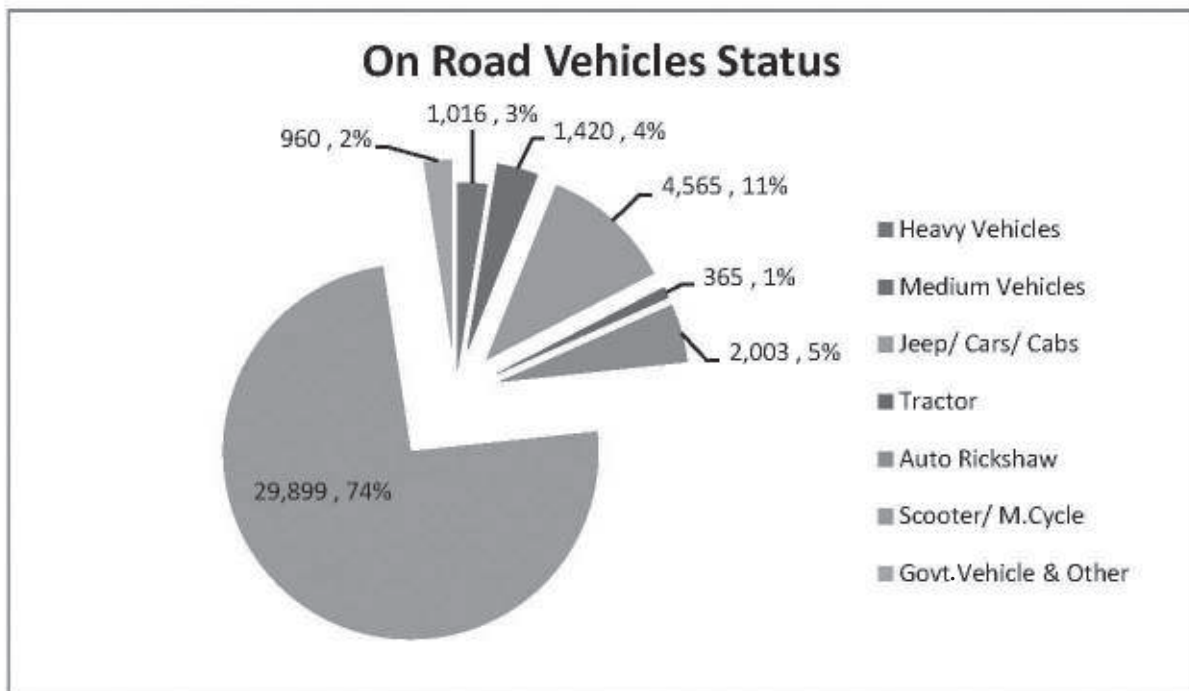
Source: District Transport Office, Kokrajhar

Figure no 2: Fast Moving Vehicles Growth



Source: District Transport Office, Kokrajhar

Figure no 3: On Road Vehicles Status



Source: District Transport Office, Kokrajhar



### **5.1.7. Parking Terminal Facilities**

Parking is also one of the major traffic problems particularly in the central area and other traffic generating areas. In Kokrajhar there are no organized parking areas. The main traffic terminals of the town are Bus-stand and Rail way station.

The existing Bodoland Transport Services bus stand and the private Bus-stand do not have adequate space needed to serve efficiently. The parking space in Transport Bus-stand as well as at the private Bus-Stand is very inadequate and as such most of the buses are parked on the road-side-creating traffic problem. Hence providing suitable sites for both the Bus-terminal could solve the problem to a large extent.

### **5.1.8. Railways:**

The town has great advantage of rail communication by means of Broad Gauge (B.G.) lines. The railways line passes through the heart of the town and makes connection of Kokrajhar with Guwahati and Upper Assam on the east and Dhubri and other parts of the country on the West. The railways have their own housing colonies. After becoming BG lines, it has increased the commercial activities of the town and helped to a large extent for the development of Kokrajhar town.

## **5.2. Policy Framework**

The National Urban Transport Policy (NUTP) of the Ministry of Urban Development, Government of India, which is a path breaking step in the process of urban development in general and urban transport planning, development, operation and management, in particular, forms the basis for the policy framework. The Vision and Objectives of the NUTP are:

### **Vision:**

To recognize that people occupy centre-stage in our cities and all plans would be for their common benefit and wellbeing. To make our cities the most liveable in the world and enable them to become the “engines of economic growth” that power India’s development in the 21st century.

**Objective:**

The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities. Some of the parameters through which this is to be achieved are:

- Incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement.
- Encouraging integrated land use and transport planning so that travel distances are minimized and access to livelihoods, education, and other social needs, especially for the marginal segments of the urban population is improved.
- Bringing about a more equitable allocation of road space with people, rather than vehicles, is its main focus.
- Investing in transport systems that encourage greater use of public transport and non-motorized modes instead of personal motor vehicles.
- Promoting the use of cleaner technologies. Associating the private sector in activities where their strengths can be beneficially tapped.

**5.3. Issues:**

- Road cross sections not according to standards.
- Dividers are absent, only small part of road have median/divider, which makes roads accident prone.
- No traffic light, traffic movement is manually managed by the traffic personals only at limited locations.
- No designated parking facilities or any form of parking regulations are present in city, which forces people to park their vehicles on roads which reduces effective width of roads to move running traffic on them.
- None of the roads has pedestrians' facilities, like footpath.
- The right of way inside the municipal area is shared by parked vehicles and pedestrians, the streets left are very narrow for the purpose of driving.

#### 5.4. Proposal

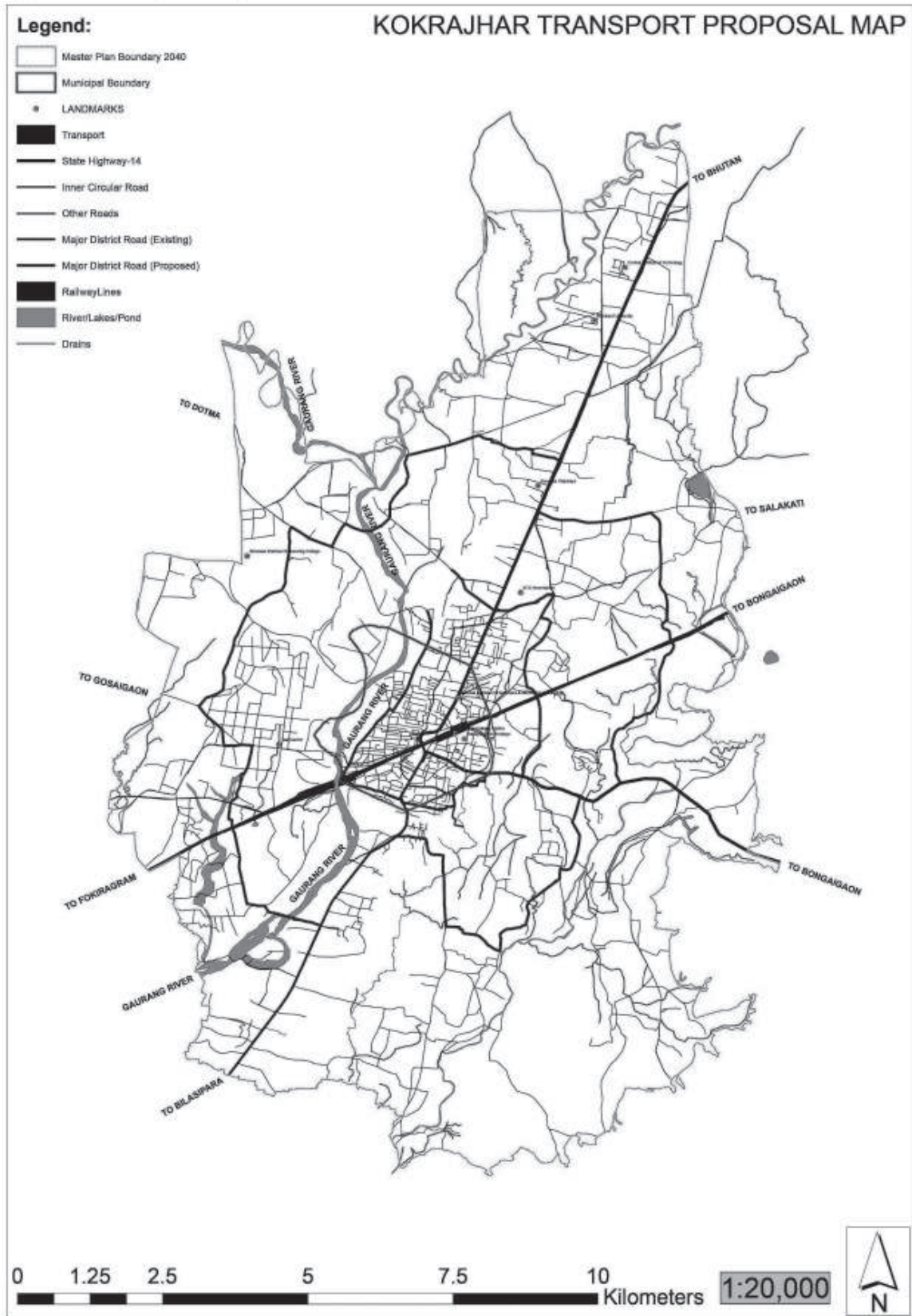
- Two new Ring Roads/Major District Roads have been proposed.
- To meet the standard road cross sections.
- Improve road infrastructure.
- Provision of parking space and footpaths.
- For intra city transportation a bus terminal is proposed and measures will be taken to promote public transport, like making certain zones vehicle free and proposing off street parking.
- A proper road hierarchy is to be proposed by providing rings, and widening the existing roads, especially to lower the load the common stretch of the State Highway and Futkibari-Kokrajhar Road.
- As per hierarchy, standards for road cross section be developed which are as follows:

Table no. 13 Proposed Roads specifications

<u>Roads Name</u>	<u>No. of Lanes</u>	<u>Width of each lane</u>
Arterial Road (Major District Roads, State Highway, National Highway)	Minimum 6 lanes divided	3-3.5m each
Sub Arterial Road (Inner Circular Roads, Ring Roads)	Minimum 4 lanes divided	3-3.5m each
Distributor/Collector Roads (Bypasses, Other roads)	Minimum 4 lanes of 3m each/ 2 lanes of 3-3.3 m each divided	3-3.5m each
Local Street	Minimum 1-2 lanes undivided	2.75-3m each
Access Street	Minimum 1-2 lanes undivided	2.75-3m each

Source: URDPFI

Map No. 5: Transport Proposals



Source: Generated by Author

## **6. PHYSICAL INFRASTRUCTURE**

### **6.1. Introduction**

**Infrastructure:** It is basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It can be generally defined as the set of interconnected structural elements that provide framework supporting an entire structure of development. It is an important term for judging a country or region's development.

**Water supply:** It is the provision of water by public utilities, commercial organizations, community endeavours or by individuals, usually via a system of pumps and pipes.

**Ground water:** Groundwater is the water located beneath the earth's surface in soil pores spaces and in the fractures of rock formation.

**Storage tanks:** Storage tanks are containers that hold liquids, compressed gases (gas tank) or mediums used for the short- or long-term storage of heat or cold water.

**Water treatment plant:** Water treatment describes those industrial-scale processes used to make water more acceptable for a desired end-use. These can include use for drinking water, industry, medical and many other uses.

**Pumping station:** Pumping stations are facilities including pumps and equipment for pumping fluids from one place to another. They are used for a variety of infrastructure systems, such as the supply of water to canals, the drainage of low-lying land, and the removal of sewage to processing sites.

### **6.2. Water Supply**

#### **6.2.1. Vision**

Sufficient and pure drinking water to be supplied for 24x7 hours a week to all the residents of Kokrajhar Master Plan area.

#### **6.2.2. Present Water Supply Status**

Presently, there is no operational water supply system in the Kokrajhar town as the water supply projects in both the southern and northern zones of Kokrajhar town are facing problems due to water leakage in water supply pipes of PVC made (pressure rating of 6 kg/cm<sup>2</sup>) when the delivering valve for the supply of water is opened. The PHE Department is taking necessary steps for replacement of PVC pipes with ductile iron pipes for an estimated cost of Rs.8.4 crores.

### 6.2.3. Water supply system

The region represents a plain terrain mostly. The drainage system belongs to Gaurang River. As per the report from the Public Health Engineering Department, Kokrajhar, the Water Supply scheme is under implementation to provide safe drinking water to the people of Kokrajhar Town. The water supply Scheme for Rs.2312.50 Lakhs is being implemented by the Public Health Engineering Department, Kokrajhar Division No-I, Bodoland Territorial Council. Kokrajhar Water Supply Scheme was designed to cover 80,674 persons in intermediate stage by the year 2019 and 1, 07,577 persons at ultimate stage in 2029. The Project area of the Scheme was calculated to approximately 7.00 Sq. Kilometres.

Kokrajhar Water Supply Scheme is divided into 2(Two) Zones namely Northern Zone and Southern Zone with independent sources and Treatment Plants and water is tapped through installation of 6 (Six) nos. of Deep Tube Wells of size 200 MM X 150 MM,3 (Three) nos. of Deep Tube Wells in each zone.

There are 2 (Two) nos of Treatment Plants of capacity of 6.20 MLD in each zone. There are 2 (Two) nos. of R.C.C. Under Ground Reservoir of capacity of 400 Cum (4,00,000 Litres) one no in each zone where filtered clear water will be stored before uplifting to the Elevated Service Reservoir.

There are total 4 (Four) nos. of R.C.C. Elevated Service Reservoir (Staging height of 14.00 Mtr) of capacity of 750 Cum (7,50,000 Litres) 2 (Two) nos in each zone where clear water will be stored before delivery to the consumers through distribution network in each distribution zone.

There is a Sedimentation Tank of Hooper Bottom Type at Southern Zone and Tube Settler Type at Northern Zone of Kokrajhar Water Supply Scheme.

The Raw water tapped from different deep tube wells installed at different locations of Kokrajhar Town and delivered to Spray Aerator then Tray Aerator followed by chemical dosing, Sedimentation Tank and then water is filtered through Rapid Gravity Filter and ultimately collected at Under Ground Reservoir and after disinfection water is delivered to the beneficiaries through Elevated Service Reservoir.

### 6.2.4. Requirement of Water Supply

The requirement of drinking water can be calculated considering the water per capita consumption of 135 lpcd as per the water supply standard prescribed by CPHEEO. Hence, the requirement of drinking water for the Kokrajhar Municipality area for 36,806 populations shall be  $36,806 \times @135 \text{ lpcd} = 4,968,810$  litres daily i.e. 4.97 MLD at present as per the population census of 2011.

### 6.2.5. Projected Water Demand up to 2040

The requirement of drinking water supply can be estimated on the basis of population growth for the perspective planning years from 2021 to 2040. The projection of water demand is estimated below at table 14.

*Table 14: Projection of water demand*

Year	Consumption rate (lpcd)	KMPA		KMA		KMPA-R	
		Population	Water reqd. (MLD)	Population	Water reqd. (MLD)	Population	Water reqd. (MLD)
2011	70	99,807	6.98	34,136	2.38	65,671	4.59
2021	70	1,15,136	8.05	36,806	2.57	78,330	5.48
2031	70	1,30,479	9.13	39,302	2.75	91,176	6.38
2040	70	1,47,176	10.30	41,777	2.92	1,05,399	7.37

*Source: Census of India, 2011, URDFI guidelines & CPHEEO's recommendation.*

It has been observed from the analysis that the demand of water for Kokrajhar Master Plan Area is 19.87 MLD in 2040 whereas the production capacity of the present water treatment plants of both the south and north zones is  $6.20 \times 2 = 12.40$  MLD. Hence, there shall be a gap of water demand equal to  $19.87 - 12.40 = 7.37$  MLD.

For firefighting  $100 \times \sqrt{\text{projected population for 2040}}$  i.e. 37533.2 Litres of water is required.

As per URDPFI for a water supply requirement of 10 MLD a water treatment plant of the site area 0.19 Ha is required.

**Location and sources of Water Treatment Plant to be delineated only after detailed technical and economic and social viability study.**

**#Note: Ground Water not to be preferred as a source of water for mass population.**

### **6.3. Sewerage Management**

#### **6.3.1. Introduction**

Sewerage is a comprehensive term which includes all constructions for collection, transportation, pumping, treatment and final disposal of sewage. Providing sewage disposal, accordingly sewage disposal has also been considered as one of the critical component of urban infrastructure determining the quality of life in urban sector. Inadequate sewerage system leads to water pollution and affects the health and quality of life adversely.

#### **6.3.2. Vision**

The town to be clean and free of pollution from sewage and the system of sewerage management to be made of state of the art of technology.

#### **6.3.3. National Urban Sanitation Policy**

The aim of the National Urban Sanitation Policy (NUSP), 2008 is to transform Urban India into community driven, totally sanitized, healthy, and liveable cities and towns.

Basic features laid down in NUSP given below should be adhered for planning of the cities,

- **Cities must be open defecation free**
- **Must eliminate the practice of manual scavenging and provide adequate personnel protection equipment that addresses the safety of sanitation workers.**
- **Municipal sewage and storm water drainage must be safely managed**
- **Recycle and reuse of treated sewage for non-potable applications should be implemented wherever possible.**



- Solid waste collected and disposed of fully and safely
- Services to the poor and systems for sustaining results
- Improved public health outcomes and environmental standards.

The objective of public waste water collection and disposal system is to ensure that sewage or excreta and sullage discharged from community is properly discharged, collected, transported, treated to the required level of degree and finally disposed-off without causing any health or environmental problems.

#### 6.3.4. Existing Sewerage System

Presently, there is no system of sewerage management in the Kokrajhar Municipality area by the Municipality Board. It is seen in the Kokrajhar Municipality area that the waste waters and sewage are flowing from residential areas or commercial areas to the nearby drains where the drains are remaining full of waste water and sewage. Some where the waste waters are flowing down on the roads due to lack of proper drains. Some where the waste waters are flowing to the Tarang canals which are flowing to the Gaurang River. All these unplanned or unmanaged flow of waste waters are making the pollution in some areas and lastly polluting the Gaurang River. It is seen that most of the waste waters are being absorbed on the ground during flow on open unconstructed drains.

As the urbanisation is growing due to rise in population, the importance of taking care of sewage has become very important. We see the problems of other cities or town due to lack of management of waste water and sewage. The Kokrajhar town is presently not having so much quantity of sewage generation and can be suitably managed right from now if attention is given to avoid the future probable problems.

The Kokrajhar town is presently having large open spaces of vacant land or agricultural fields where the waste water are flowing in open natural drains and infiltrated in to the ground. However, when the drains are constructed and developed, waste waters cannot flow in open natural drains, and waste water lost due to infiltration in to ground shall not occur.

### 6.3.5. Status of Sewerage disposal system

*Table 14: Status of sewerage in Municipality area (KMA)*

Indicator	Benchmark Value	Town Status
Coverage of toilets	100%	93.36%
Coverage of waste water network services	100%	5.22%
Collection efficiency of waste water network	100%	NA
Adequacy of waste water treatment capacity	100%	NA
Extent of reuse and recycling of waste water	20%	NA
Extent of cost recovery in waste water management	100%	NA
Efficiency in redressal of customer complaints	80%	NA
Efficiency in collection of sewerage related charges	90%	NA

*Source: Census of India, 2011*

There is presently no sewerage system in Kokrajhar town and the sewage is disposed off in open drains from different households. The toilet coverage in Kokrajhar Master Plan area is 49.63% only and 50.37% households do not have any toilet coverage.

*Table 15: Status of toilets in KMPA, KMA & KMPA-R*

Toilets types	KMPA	KMA	KMPA-R
Coverage of toilets	49.63%	93.36%	42.34%
Piped sewers	6.14%	11.62%	5.22%
Septic tank	20.63%	58.30%	14.35%
Other system	5.56%	3.89%	5.84%
Pit Latrine	16.48%	16.79%	16.43%
Night Soil disposed into open drain	0.20%	0.32%	0.19%
Service Latrine	0.61%	2.45%	0.31%
Households not having latrines	50.37%	6.64%	57.66%
Public latrine	1.62%	1.75%	1.60%
Open latrine	48.75%	4.90%	56.06%

*Source: Census of India, 2011*

93.36% of households in the Municipality area have coverage of toilets whereas only 42.34% of households in the Master Plan Area (Rural) have coverage of toilets.

### 6.3.6. Projected Wastewater Generation

As per CPHEEO manual, 80% of water supply may be expected to reach the sewers however it recommends designing the system by considering minimum waste water flow of 100 litres per capita per day. The 80% of 135 lpcd water consumption comes to 108 litres and hence the waste water generation can be considered as 108 lpcd for estimation of future waste water generation.

*Table 16: Projection of Waste Water Generation for Kokrajhar Municipality area*

Year	Urban Population	Waste Generation rate (LPCD)	Quantity of Waste Water Generated	
			(LD)	MLD
1961	9,489	56	531,384	.53
1971	17,060	56	955,360	.95
1988	26,775	56	1,499,400	1.49
2001	31,164	56	1,745,184	1.74
2011	34,136	56	1,911,616	1.91
2021	36,806	56	2,061,136	2.06
2031	39,302	56	2,000,912	2.20
2040	41,777	56	2,339,512	2.33

Note: LPCD-Litres per Capita Daily, LD-Litres Daily, MLD-Litres Per Capita Daily

Source: URDPFI & Manual of CPHEEO

#### Proposals

- As per URDPFI for a waste water generation of 2.33 MLD a sewage treatment plant of the site area 0.2 – 0.3 Ha is required.
- Sewage Management Plan/ Faecal Management Plan is to be prepared and should include the following aspects:
  - Short term proposals (Immediate infrastructure to be bought for collection and treatment of sewage)
  - Long term proposals (100% sewerage system coverage)

## 6.4. Drainage

Storm water- when rain falls over the ground surface, a part of it percolates into the ground depending upon the porosity level of soil, but the major composition enter in the sewer and with sewage which is known as storm water. Drainage – It is the facility which manages storm water. The function of a sewerage system is to convey domestic and industrial wastes and runoff from the precipitation, safely and economically to the point of disposal. Out of the total rainfall occurring in the area, only a part of it enters the storm sewers. The rest of it percolates into the open, playfields, unpaved areas etc. The quantity of storm water reaching the drains is very large as compared to the sanitary sewage. In Kokrajhar since the annual average rainfall is above urban safety a standard it is very important to maintain proper drainage system. The present situation of sewage directly being fed to drainage channels makes it even more crucial for the drainage system to take out the water from the township.

### 6.4.1. Vision

The storm water drainage system of the Kokrajhar town to be efficiently capable of accommodating the flow of all the storm rain water during rainy season and keep all the parts of the town clean and free from flooded water.

### 6.4.2. Existing system of drainage

There is no proper system of drainage in the Kokrajhar town. There is a River known as Tarang River on the east-north side of the Kokrajhar Master Plan Area in the Halowadhoh village. There is a switch gate in the Tarang River and some water of the Tarang River is diverted to canal which flows through the heart of the Kokrajhar town. The flow of water in the canal is divided into 3 sub canals at different locations and all the 3 sub canals flow through the heart of the Kokrajhar master plan area. The water from the canals also goes to the agricultural fields for cultivation.

All the sub canals are working as drains of the town, but the capacity of the drains is not sufficient to accommodate the rain water accumulation during the rainy season. Some parts of the canals are very small and shallow due to which the flow of the water is not fast and cannot quickly discharge the rain water from the areas. There are also solid waste materials thrown on the canals which block the smooth flow of the rain water. The rain water, waste water or the sewage of the town are allowed to fall on the sub canals and flow to the Gaurang River without any treatment. The three Tarang sub canals flowing through the town can become very good master drain if properly rejuvenated and developed and keep the town clean. There are many places or areas which do not have any drain system and rain water remain on roads and low lying vacant land plots during rainy season. All the low lying lands or the developed land are not having drain system with proper drain design to accommodate rainwater sufficiently and do not make the easy flow of rain water to the main master drain.

Table 17: Existing Major Drain System

Sl. No.	Name of Drain	From	To	Width (feet)	Conditions
1	Fakiragram Road	Police Point	Railway Flyover	4.5	Both Side But Not Good
		Railway Flyover	Dotma road intersection	4.5	Right Side Only But Not Good
		Dotma Road	D.C. Road Intersection	4.5	Both Side But Left Side Not Completed & Not Good
		D.C. Road Intersection	Intersection Near Gaurang	4.5	Both Side But Left Side Not Completed & Not Good
		Intersection Near Gaurang	No. 2Gaurang Bridge	4.5	No Foot Path
2	Bilasipara road	Railway gate	Bahalpur Road Intersection	5.0	Both Side
		Bahalpur Road Intersection	Police Point(End Of The Flyover)	5.0(Left) 3.0(Right)	Both Side
		Police Point(End of the Flyover)	Agriculture Office Road	5.0	Both Side But Not Good
		Agriculture Office Road	Narabari JN.		No Drain
3	Bahalpur Road	Bilasipara Road Intersection	Railway Station Road	5.0	Both Side

		Railway Station Road	Next Intersection Point	4.0	Both Side
		Next Intersection point	Hatimata Intersection Road	4.0	Left Side Only
		Hatimata Intersection	New Railwayover Bridge Road		No Drain
4	Dotma Road	Fakiragram Road intersection	Patharghat JN	4.0	Both Side But Not Good
		Pathar Ghat Jn	Sc.College	4.0	Both Side But Not Good
		Sc.College	BoroBhatamari Bathaumandir	4.0	Left Side Only
		Bathaumandir	Donbosco Intersection Road	—	No Drain
		Donbosco Intersection road	No.1 Gaurang River Bridge	—	No Drain
5	Karigaon Road	Police Point	Santi nagar Intersection Road	5.0	Both Side
		Santi Nagar Intersection Road	Donbosco Intersection Road	5.0	Both Side

	Donbosco Intersection Road	F.C.I. Godown	5.0	Both Side
	FCI Godown	Secretariat office intersection	-	No drain

*Source: Primary Survey*

It has been observed from the survey that the existing drain systems are not up to the mark as it should be and hence necessary rejuvenation and reconstruction of existing drains need be carried out. The new drains need be constructed where there are no drains on the road side.

### 6.4.3. Issues

Below summarized the identified major deficiencies in the existing solid waste management system in the city:

- Inadequate primary and secondary waste collation facilities- Both the primary and secondary waste collection facilities are not provided throughout the city. Only small area of the city is benefited with these facilities.
- The bulk of the solid waste is not collected at daily basis, and is being left to decay on the roads, open spaces, and into the water bodies and open drains.
- Inadequate solid waste transportation system.
- Concept of segregation of waste is missing- Garbage is dumped into the dumping site without segregating of the waste.
- At many points in the system waste management rules are being violated- Though the city contains a good number of hospitals, the city does not have systematic and scientific way of disposing biomedical wastes; instead, they are simply being dumped along with the other municipal waste.
- Lack of awareness among citizens; they are habited to throw garbage into the open drains.



## **6.5. Solid Waste Management**

**Municipal Solid Waste (MSW) is the trash or garbage that is discarded day to day in a human settlement. According to MSW Rules 2000 MSW includes commercial and residential wastes generated in a municipal or notified areas in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes. Waste generation encompasses activities in which materials are identified as no longer being of value (being in the present form) and are either thrown away or gathered together for disposal.**

### **6.5.1. Vision**

**Kokrajhar town to be completely beautiful, neat & clean and free of pollution from any types of solid waste materials.**

### **6.5.2. Systematic process**

**Municipal Solid Waste Management (MSWM) refers to a systematic process that comprises of waste segregation and storage at source, primary collection, secondary storage, transportation, secondary segregation, resource recovery, processing, treatment, and final disposal of solid waste. For effective MSWM following steps should be followed, hence appropriate considerations should be made at planning.**

### **6.5.3. Storage of waste**

**Storage of waste at source is the first essential step of Solid Waste Management. Every household, shop and establishment generates solid waste on day to day basis. The waste should normally be stored at the source of waste generation till collected for its disposal.**

**Biodegradable waste and non-bio-degradable waste should be collected in separate bins from the source. Waste bins for biodegradable waste should be painted 'Green', those for storage of recyclable wastes should be printed 'White' and those for storage of other wastes (metal/glass/hazardous) should be printed 'Black'.**

#### **6.5.4. Primary collection of waste**

Primary collection of waste is the second essential step of Solid Waste Management activity. Primary collection system is necessary to ensure that waste stored at source is collected regularly and it is not disposed of on the streets, drains, water bodies, etc.

Local bodies should arrange for the primary collection of waste stored at various sources of waste generation by any of the following methods or combination of more than one method:

- Doorstep collection of waste through non-motorised and motorised vehicles with active community participation.
- Collection through community bins
- Doorstep or lane-wise collection of waste from authorised/unauthorised slums or collection from the community bins to be provided in the slums by local bodies.

#### **6.5.5. Waste Storage Depots**

This is the third essential step for an appropriate Solid Waste Management System. All the waste collected through Primary Collection System, from the households, shops and establishments has to be taken to the processing or disposal site either directly necessitating a large fleet of vehicles and manpower or through cost effective systems which are designed to ensure that all the waste collected from the sources of waste generation is temporarily stored at a common place called "Waste Storage Depots" and then transported in bulk to the processing or disposal sites. Such temporary arrangement for storage of waste is popularly known as dust bin, dhalavs, etc. This facility has to be so designed that the system synchronizes with the system of primary collection as well as transportation of waste. Locations for bins/depots of appropriate size should be identified at planning stage.

### 6.5.6. Transportation of the waste

Transportation of the waste stored at waste storage depots at regular intervals is essential to ensure that no garbage bins/containers overflow and waste does not littered on the streets. Hygienic conditions can be maintained in cities/towns only if regular clearance of waste from temporary waste storage depots (bins) is ensured. Transportation system has to be so designed that it is efficient, yet cost effective. The system should synchronize with the system of waste storage depot and should be easily maintainable.

### 6.5.7. Existing System of Solid Waste Management

Kokrajhar Municipality Board (KMB) is presently engaging a number of staffs for collection, segregation and dumping of solid waste materials for the ward no-7. The solid waste materials are segregated in primary, secondary and tertiary stages. The collection and segregation of solid waste materials are presently not carried out in other wards other than ward no.- 7.

Most of the solid waste materials from wards other than ward no -7 are collected from the road side places by the Municipality and dumped near sosan ghat (Crematorium Ground) on the eastern bank of Gaurang River without segregation.

The solid waste materials lying on roads like tree leaves are collected manually by the private parties and taken to a proper place for producing vermi composts for agricultural use.

Presently important sources of solid waste generation are (i) Residential areas (ii) Fruit and vegetable market (iii) Hotels and restaurants (iv) Hospitals (v) Drains de-silting (vi) Commercial & Industrial wastes from these areas.

Solid waste generation from specific areas: 1) Vegetable & fruit markets, 2) Hotel & restaurant, 3) Hospital waste 4) Hostels, 5) Shops etc. are very high. Besides the above sources, the solid waste is also generated from (1) Construction and Demolition Activities, (2) Motor Garages, (3) Industries, (4) Carcass Disposal, (5) Dairy and (6) Dhobi Ghat.

### 6.5.8. Upcoming projects and Schemes

The Kokrajhar Municipality Board (KMB) is taking some major steps for making Garbage free town in the Kokrajhar Municipality area. They are carrying on a programme known as Solid Liquid Resource Management (SLRM) Programme under Swachh Kokrajhar Mission. Recently the KMB is implementing the programme in ward no-7 where Solid Waste Materials are collected from the door steps of the household families, segregated into different materials and most of the wastes are reused or recycled. Some of the waste materials which cannot be reused or recycled are dumped or buried near Crematorium (Sosan Ghat) on the bank of Gaurang River. There are total 10 nos. of wards and the SLRM programme is not implemented in other wards of the Municipality area. The KMB has a vision of zero waste management where no waste shall be dumped or disposed of without reuse or recycled. The KMB has a target to complete the project of garbage free town within 2016 and it has to be declared on 26th January'2017.

### 6.5.9. Solid Waste Generation

As per the manual of Solid Waste Management of CPHEEO 2000, the following table indicates the waste generation per capita per day for estimation and forecast of waste generation for future for planning purposes:

*Table 18: Solid Waste Generation per capita per day*

Land use type	Waste generation	Consider average for Kokrajhar
Residential refuse	0.3 to 0.6 kg/cap/day	0.45 kg/cap/day
Commercial refuse	0.1 to 0.2 kg/cap/day	0.15 kg/cap/day
Street sweepings	0.05 to 0.2 kg/cap/day	0.13 kg/cap/day

Institutional refuse	0.05 to 0.2 kg/cap/day	0.13 kg/cap/day
	Average =	0.215 kg/cap/day

*Source: Manual of CPHEEO*

For the purpose of estimation of solid waste generation for the Kokrajhar town, the average value of waste generation rate is considered which comes to 0.215 kg/cap/day.

#### 6.5.10. Solid Waste Projection

The generation of Municipality solid wastes can be estimated on the basis of consideration from the Table 18 above and similarly the generation of solid waste also can be projected on the basis of population growth of the Kokrajhar Municipality area. The projection of solid waste generation of Kokrajhar Municipality area is shown at Table 19.

*Table 19: Projection of Solid Waste Generation of Kokrajhar Municipality Area ( Considering 0.215 Kg/C/D)*

Year	Urban Population	Waste generation Rate (Kg/C/D)	Quantity of Solid Waste (Kg/C/D)	Quantity of Solid Waste (MT/C/D)
1961	9,489	0.215	2040.14	2.04
1971	17,060	0.215	3667.90	3.67
1988	26,775	0.215	5756.63	5.76
2001	31,164	0.215	6700.26	6.70

2011	34,136	0.215	7339.24	7.34
2021	36,806	0.215	7913.30	7.91
2031	39,302	0.215	8449.99	8.45
2040	41,777	0.215	8982.08	8.98

*Note: Kg/C/D - Kilogram per Capita per Day, MT/C/D - Metric Ton per Capita per Day*

*Source: Manual of CPHEEO and analysis by Author*

The projection of solid waste generation is made on the basis of population growth and it is seen that the generation of solid wastes are increasing steadily from 7.34 MT/C/D in 2011, 7.91 MT/C/D in 2021, and 8.45 MT/C/D in 2031 to 8.98 MT/C/D in 2040.

Now the necessary steps can be taken accordingly by the concerned authority to manage the collection, segregation, treatment and properly disposal of the solid waste materials without creating any pollution. Proposals can be made for the establishment of treatment plants at a proper location for properly treatment and disposal of such generation of solid wastes.

#### 6.5.11. Landfill Area Requirement

Presently there is no defined allotted area for landfill. However, the solid waste materials are dumped near the Sosan Ghat (Crematorium ground) on the eastern bank of Gaurang River and on the southern side of the Railway lines.

#### 6.5.12. Proposals

As per URDPFI for a waste generation of 8.98 MT/C/D a land fill area of the site area  $(0.28 + 50\% \text{ of } 0.28) = 0.42$  Ha is required.

Also as per MoUD, 'Cities are sitting on untapped wealth, i.e. waste to wealth'. In India, many of such practices of conversion from waste to wealth have been successfully implemented, where waste is treated as a commodity for sale and purchase. However

this is required to be planned by the other cities in a phased manner in respective situations with multiple party interventions.

## **7. SOCIAL INFRASTRUCTURE**

The quality of life in any urban centre depends upon the availability of and accessibility to quality social infrastructure. Together, these pertain to health, education, sports facilities, socio-cultural activities, communications, security and safety, recreation, religious activities, social congregations and community events, cremation / burial grounds etc. These are generally planned in terms of population norms with stipulated permissibility conditions and development controls.

### **7.1. Education Facilities**

The education is the brain of a society. The people of a society without education cannot develop their knowledge, grow and improve their living conditions and they remain as persons without knowledge. The educational environment in the society is not up to the mark as expected as to achieve 100% literacy in the society. To make the people educated in the society the proper educational planning is very important. The education should be considered as very important sector for the development of a society or the state or the nation.

#### **7.1.1. Primary, Sr. Secondary Schools & Higher Education Facilities**

Kokrajhar has a high number of government Primary and Secondary schools as compared to private. The number of each education facility has been listed out below. These schools and colleges cater to a large number of students from Kokrajhar and nearby villages. There are at present 93 primary schools and 64 secondary and higher secondary schools including degree colleges with Classes XI and XII catering to a population of around 34,136.

*Table 20: List of Educational facilities with Ownership, Kokrajhar*

Facilities	Hierarchy	No. Of Facility	Government	Venture/Private	Location (Village No.)	Adequacy/ Status	
						Yes	No
Education	Primary	93	89	4			No
	Secondary (Up)	20	20	0			No
	Sr.Secondary (Hs)	13	13	0			No
	Hss & College	15	4	12			No
	Private Schools	16	-	-	-	-	No
	University	1	-	-	-		No

Source: DEEO, Kokrajhar, BTC

### 7.1.2. Vision

- To make everybody literate and achieve 100% literacy.
- To generate highly qualified individuals and resource persons.
- To make access to every families for education in the society whether rural or urban.

The Kokrajhar town to be a hub of education for all levels for all ages of students and learners with state of the art infrastructure facilities which are capable of delivering quality education and knowledge to students and learners.



### **7.1.3. Goals & objectives:**

- **To make education for all children, boys, girls and illiterate adults.**
- **To make available educational institutions for all levels of education.**
- **To create peaceful and proper educational environment in the town.**
- **To establish state of the art infrastructure facilities for higher education.**
- **To make the town as a hub of quality education for all.**

### **7.1.4. Development concept**

**All the schools from lower level primary schools to high schools should have good infrastructure facilities having good buildings, furniture and well trained teachers.**

**Any new primary or high school should be established if all children in a particular locality are not completely accommodated in the available schools.**

**All the schools including Government and private primary schools should be properly inspected and encouraged by the education authority to provide all the necessary facilities in the schools in a timely manner.**

**All the teachers of the schools should be trained up regularly on a timely manner and their performance records should be maintained for their grading and promotion.**

**All the higher secondary schools and graduate colleges should have good infrastructure facilities of hostels, proper class rooms for minimum students, furniture, libraries, laboratories, auditorium, sport fields, etc.**

**All the higher secondary schools and graduate colleges should have sufficient qualified teachers for imparting quality education to students.**

**All the qualified teachers should be trained up through meetings, seminars, workshops and given assignment for producing sufficient number of well performed students on the basis of which the awards for teachers be provided for their promotion and reputation.**

**New training institutions either private or Government should be established to provide professional technical training to the students having matriculate, intermediate and graduate qualifications for helping them to be self-sufficient for self-employment.**

**New educational institutions for higher education should be established with facilities of state of the art technology for promoting health, engineering, technology, business, agriculture, etc.**

New distance education system should be established by opening new Open University or by affiliating with the existing Bodoland University for providing education to the students of remote places or the students of other cities of the country which will help to make the Kokrajhar town as the hub of quality education.

#### 7.1.5. System of Education in the State

The District Elementary Education office of the kokrajhar district is situated at the heart of the town on the southern side of the Kokrajhar railway station. The DEEO office is a three storied building where the ground floor is used by DEEO and SSA, 1st floor is used by SSA, 2nd floor is used by the Joint Director office of BTC and the DI office is in another building in the same premises. There are 17 staff under DEEO, 26 staffs under SSA, 38 staff under DIS. Besides being an administrative centre for whole the district, it plays an important role of managing, imparting all the educational programmes of BTAD. There are 4 blocks and one venture block in Kokrajhar district. SSA district office and DI office is also in the same complex. The elementary education department is also running from this office. There are 35 no's of elementary schools excluding 4nos of composite schools in the Kokrajhar town urban area.

The administrative building of the office needs many improvements as per the following for quality management of the education services in the district as well as in the BTAD. (Source: DEO Office Kokrajhar)

The complete building needs major repair and renovation. Enough space needs to be provided for visitors, parking of vehicles. The office is visited by teachers and visitors from different districts of BTAD and need good parking facility with provision of at least 20 nos. of four wheeler vehicles and 30 nos. of two wheeler vehicles.

Provision of a canteen with pure drinking water facility and separate conference hall needs to be kept in addition with providing the complete office with Wi-Fi zone. There also should be provision for separate computerised chamber with LAN and internet connectivity facility for the departmental heads for discharge of duties in a better way. Provision for separate Toilets (Ladies & gents) is urgently required in respect of keeping cleanliness and Swachh Kokrajhar. The existing furniture of the office are out of date and are about to damage due to depreciation and needs urgent replacement to for smooth functioning of the department in the greater interest of the people.

The office of the Deputy Inspector, Kokrajhar is established in the Assam type building, in an old fashion which may be dismantled to develop the infrastructure facilities of the office to discharge office duties in a better way. The office building should have emergency fire-fighting facilities.

### 7.1.6. Student – Teacher Ratio

Right to education act (RTI) mandates an optimal student teacher ratio of 30:1 for all Indian Schools in India. The student – Teacher ratio in the Kokrajhar Master Plan Area is shown below at Table 16a:

*Table 21: Student-Teacher Ratio of Kokrajhar Master plan Area,*

Sl.no.	Category	No. of Schools	No. of Students	No. of Teachers	Student/Teacher
1	Lower Primary School	108	5887	370	15.91
2	Upper Primary School	27	4025	230	17.50
3	High School	15	3467	164	21.14
4	Higher Secondary School	5	1585	70	22.64
5	College	4	1703	134	12.71
<b>Total</b>		<b>159</b>	<b>16667</b>	<b>968</b>	<b>17.22</b>

*Source: DEEO, Kokrajhar, BTC*

The Student- Teacher ratio in the Kokrajhar Master Plan Area is 17:1 which is much better than the standard requirement of 30:1.

### 7.2. Health Facilities

The World Health Organisation (WHO) defines health as a state of complete physical, mental and social welling. The objective is to attain the same for the total Kokrajhar Master Plan Area population. The size of a hospital depends upon the hospital bed requirement, which in turn is a function of the size of the population it serves. As per the Indian Public Health Standards (IPHS), 2012, the calculation of number of beds is based on annual rate of admission as 1 per 50 population.

Average length of stay in a hospital as 5 days

For example: In India the population size of a district varies from 50,000 to 15, 00,000. For the purpose of convenience the average size of the district is taken as one million population. Based on the estimated population of Kokrajhar in 2041 the number of beds required for 150,000 population is:

No. of bed days per year :  $(150,000 \times 1/50) \times 5 = 15,000$

No. of beds required with 100% occupancy :  $1, 50,000 / 365 = 410$

No. of beds required with 80% occupancy :  $(1, 50,000 / 365) \times 80\% = 328$

### 7.2.1. National Health Policy

The objective of the National Health Policy is to achieve an acceptable standard of good health amongst the general population of the country. The approach is to increase access to the decentralized public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions. In principle this policy provides for the participation of the private sector in all areas of health activities. The State Government follows the National Level policy for development of Health Infrastructure, one of the major objectives being attainment of 'health for all'.

### 7.2.2. Existing Situation

Presently, there are three Government hospitals with 260 beds. There are 2 private hospitals with 60 beds run by private organizations under Kokrajhar Block.

*Table 23: Number of Hospital facilities with Ownership*

Facilities	Hierarchy	No. Of Facility	Government	Venture/ Private	Location (Village No.)	Adequacy / Status Of Facility	
						YES	N O
Health	PHE	16	-	-	-	-	No
	Sub-Centres	15	-	-	-	-	No

	Hospital	2	1	1	2	-	No
	Others(Specify)	-	-	-	-	-	-

Source: Office of the Director of H&FP, BTC

Table 23: Hospital Beds in Kokrajhar Master Plan Area

Sl.No.	Hospitals	No. of Hospitals	Beds	Total Beds	Population	Beds/ 1000 population
1	200 bedded Civil Hospital	1	200	320	99,807	3.21
2	Primary Health Centre	2	0			
3	Primary Health Centre(Mini)	5	0			
4	State Dispensary	13	0			
5	Sub-Centre	64	0			
6	Community Health Centre	2	0			
7	30 Bedded Rural Hospital	2	60			
8	Private Hospital/ Nursing Home	2	60			
Total =		91	320			

Source: Economic & Statistics Department, Kokrajhar, BTC

The present availability of hospital beds is 3.21 beds per 1,000 populations, which is less against the standard minimum requirement of 3.5 beds per 1000 population.

### 7.2.3. Norms for Health facilities

The Norms and Standards for provision of Health Infrastructure in urban areas adopted for KMP-2040 with existing shortage of beds are given in Table 25. The present health system has a shortage of 178 hospital beds to meet the standard of health infrastructure in KMPA. This is worked out to provide for 5 beds per 1,000 populations as against the existing 3.21 beds per 1,000 populations and also to result in a balanced distribution of health facilities throughout the urban area.

Table 24: Shortage of Hospital Beds in KMPA

Area	Population	Norm (Bed/1000)	Bed reqd. (No.)	Existing (Bed/1000)	Existing Beds (No.)	Shortage of Beds
Municipality Area	34,136	3.5	119	3.21	110	9
Master Plan Area (Excluding Municipality)	65,671	3.5	231	3.21	211	20
<b>Total =</b>	<b>99,807</b>				<b>320</b>	<b>29</b>

Source: Economic & Statistics Department, Kokrajhar, BTC

The following table 24 gives an estimated Hospital Bed demands in the perspective years from 2011 to 2041. On this basis, in the year 2040, Kokrajhar Urban Area would require 576 beds in 2021, 652 beds in 2031 and 736 beds in 2041 against 320 beds at present by addition of 416 beds to meet the norms and standards of Health Infrastructure.

Table 26: Estimated Hospital Bed Demands from 2011 to 2041

Year	Municipality Area		Master Plan Area (Excluding Municipality)		Total Beds in Demand (Nos.)
	Population	Bed demands	Population	Bed demands	

2011	34,136	119	65,671	231	350
2021	36,806	130	78,330	273	403
2031	39,302	137	91,176	315	452
2040	41,514	144	1,03,456	361	505
2041	41,777	144	1,05,399	368	512

*Source: Economic & Statistics Department, Kokrajhar, BTC*

#### 7.2.4. Open Spaces

The open spaces can include the following three categories, namely:

- a) Recreational space
- b) Organized green
- c) Other common open spaces (such as vacant lands/ open spaces including flood plains, forest cover etc. in plain areas.

Considering open spaces, including all the above-mentioned categories, provision is 10.12 sqm per person may be desirable. In the built up area (excluding recreational space, vacant land, flood plain, forest) the NBC suggests 3 sqm/ person as minimum norm. The hierarchy for organised green such as parks, play fields and other open spaces like specified park, amusement park, maidan, a multipurpose open space, botanical garden and zoological parks, traffic parks etc. are as under:

*Table 26: Hierarchy of Organised Green*

Sl. No.	Planning Unit	No. Of Organised Green Spaces

1	Housing Cluster	3 - 4 Local Parks And Playgrounds
2	Neighbourhood	3 - 4 Local Parks And Playgrounds
3	Community	2-3 Community Level Park And Open Space
4	District/Zone	1 District Level Park And Sports Centre, Maidan
5	Sub-City Centre	1 City Level Park, Sports Complex, Botanical / Zoological Garden, Maidan

*Source: UDPFI Guidelines, 1996*

Norms for providing parks and other green spaces in kokrajhar are taken and analysis of all planning unit were taken into consideration while planning for population of the year 2041 to cater their green space/Open space need.

*Table 28: Norms of Organised Green for Plain Areas*

Sl. No.	Planning Unit	Population Served Per Unit	Area Requirement (Ha)
1	Housing Cluster	5000	0.5
2	Neighbourhood	15000	1
3	Community	1 lakh	5
4	District/Zone	5 lakh	25



5	Sub-City Centre	10 lakh	100
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*Source: MPD, 2021*

### 7.2.5. Proposals

#### *Town Level*

One of the major goals of the plan is to create a unique image for the city of Kokrajhar befitting that of a State Capital. This can be achieved through the creation of landmarks and interesting urban forms. Some of the major city level projects identified for enhancing the capital city image of Kokrajhar are as under:

#### — Education and Research Hub

The Education and Research Hub shall contain regional-level institutions for research activities. A Medical college with a Multi-speciality Hospital covering 15 ha shall also be located within this area. The hub shall have Institutional area, residential area, sports and cultural area and landscape component. Its details are as under:

Area : 107 Ha

#### — Health

As per IPHS 2012, the no. of beds required for a city - Average length of stay in a hospital as 5 days. It is evident that beds available in the city hospitals are not sufficient. An additional 400 no. of beds to be accommodated in the city.

#### — Multi-Speciality Hospital

Beds: 200 minimum

Area: 9 Ha

#### — Intermediate Hospital ( Category A)

Beds: 200 minimum

Area: 3.7 Ha

Also the existing Civil hospital and the Rural Hospital must increase its capacity.

— **Exhibition-cum-Fair Ground**

Kokrajhar is the cultural and economic hub of the whole BTC. There are a number of festivals and fairs held in the city. Considering the number of tourists visiting these fairs, it is proposed to develop an exclusive exhibition cum fair ground to organize fairs, exhibitions and shows and events for cultural as well as economic benefits. Its area and location are as under:

Area : 412 Ha

— **Parks and Playground**

One unit of District park is proposed. Its area and location are as under:

Area : 25 Ha

Parks and playground and other Open spaces are provided accordingly:

1. For each housing cluster .5 Ha Land is allotted for green space
2. For Each neighbourhood 1 Ha land is allotted as park space
3. One unit of Community park is proposed of 5 Ha.

**Other Controls:**

1) Open spaces/ maidans should be spatially distributed and multiple function in time to be promoted.

2) In any layout or sub-division of land measuring 0.3 Ha or more in residential and commercial zones, the community open space shall be reserved for recreational purposes which shall as far as possible be provided in one place.

— The minimum recreational space provided shall be 450 sqm.

— The minimum average dimension of the recreational space shall not be less than 7.5 m and the length shall not exceed 2.5 times the average width.

3) Each recreational area and the structure on it shall have an independent means of access.

4) Any building line to be at least 3 m away from the boundary of recreational open space.

5) Zoological garden to be as per Central Zoo Authority provisions.

— River Front Development

River front development along the river Gaurang is envisaged to celebrate the beauty of the river and integrate it with the recreational green belt along it. In areas on new development along the river, a 200-m wide belt is proposed to maintain the serenity of the river.

— Community Level

At the Community level, an Integrated Community Centre (ICC) is proposed. A Community Centre shall contain:

- Community Hall for every unit population of 15000 is to proposed i.e. 10 units.
- Post office for every unit population of 15000 is to proposed i.e. 10 units.
- Community Commercial Centre of about 5.4 ha land for 1 lakh population.
- Community-level Facility Centre containing Community level facilities, including Community-level Parks and Play areas.
- Housing Park for every unit population of 5000 is proposed.

## 8. HOUSING AND SLUMS

### 8.1. Vision

All the buildings, houses, shelters to be concrete and permanent buildings for all the people residing within the town whether that may be residential, commercial, institutional or official buildings.

### 8.2. Present housing situation – Census of India, 2011

In 2011, Kokrajhar Master Plan Area contains 21,044 housing units out of which 20,463 units are exclusively residential and 581 are put to residence-cum-other uses. Out of the

total housing, 91.73% households live in owned residences, 5.51% in rented and 2.76% in other accommodations. Out of the total 21,044 residences in 2011, 11,756 (55.86%) are of good condition; 7,642 (36.31%) of liveable condition and 1,647 (7.82%) in dilapidated condition. 58.33% of the population lives in one- or two-roomed accommodation; 30.09% in three- or four-roomed accommodation and 10.79% in 5-roomed and above. (Source: Census of India, 2011)

### 8.3. Housing Shortage in 2040

Housing shortage in Kokrajhar Master Plan Area in 2011 is 1,647. Census data on the number of households, number of residential houses is as follows:

A. Total no.of Households .....	21,044
B. Total number of residential houses and houses used for residence-cum-other purposes .....	(20,463+581) = 21,044
C. Backlog of housing required (A-B) .....	000
D. Dilapidated houses (Residence and Residence-cum-other uses).....	1,647
E. Total Housing Shortage in 2011 (C+D) .....	1,647 (7.82% of the households)
F. Total Housing Stock (A-D).....	19397 (92.17% of the households)

### 8.4. Housing – KMP 2040

#### 8.4.1. Housing – KMP-2040

As per 2011 Census, the total household in the Kokrajhar Master Plan Area is 21,044 and the population is 99,807 and hence the average household size in Kokrajhar Master Plan Area is 4.74.

For 2040, a household size of 4.7 has been adopted to work out the housing requirement.

#### 8.4.2. Housing Needs -2040

The projected housing requirement in KMP Area in 2040 is as under:

*Table 29: Housing Estimates up to 2040*

Year	2011	2021	2031	2040	2041
Population (a)	99,807	1,15,136	1,30,479	1,45,293	1,47,176
Household size (b)	4.7	4.7	4.7	4.7	4.7
Households (c=a*b)	21,044	24,497	27,761	30,913	31,314
Housing stock (d)	19,397	19,397	19,397	19,397	19,397
Additional Housing Reqd. (e=c-d)	1,647	5,100	8,364	11,516	11,917

*Source: Census of India, 2011 & Analysis by author*

The additional housing requirements are estimated on the basis of projected population growth and the household size of 4.7 instead of existing household size of 4.74 in 2011 considering probable decrease in household size. The housing requirement for 2011 is 1,647 which are shortage of housings and future additional housing requirements are 5,100 in 2021, 8,364 in 2031 and 11,917 in 2041.

#### 8.4.3. Housing Status

The business houses, buildings, shopkeepers etc. are old and unhygienic. There are business establishments that are built near the roads. The buildings or market sheds for public markets are not properly constructed. The hotel buildings, restaurant buildings are not in good conditions in the main town areas. Residential is the predominant land-use of the developed area. The residential areas are developed in a much unplanned manners with narrow road and without any proper drainage facilities. Housing accommodation is one of the burning problems of present urban areas. Construction of houses cannot cope up with growth of population and migration of people, which ultimately leads to development of substandard housing. Economic condition of the migrated people is also met of the factors for development of substandard houses.

*Table 30: Types of Houses in the Kokrajhar Master Plan Area*

Types of House	No. of Houses in Master Plan Area	No. of Houses in Municipality Area	Master Plan Area (E.M.)
Permanent	8,095 (38.40%)	730 (9.83%)	3,901 (28.63%)
Semi-Permanent	11,266 (53.54%)	266 (3.59%)	6,805 (49.95%)
Total Temporary	1,334 (6.34%)	14 (0.19%)	837 (6.15%)
Serviceable	58 (0.27%)	1 (0.02%)	35 (0.26%)
Non-Serviceable	1,275 (6.06%)	13 (0.17%)	802 (5.89%)
Unclassifiable	348 (1.66%)	50 (0.67%)	134 (0.98%)

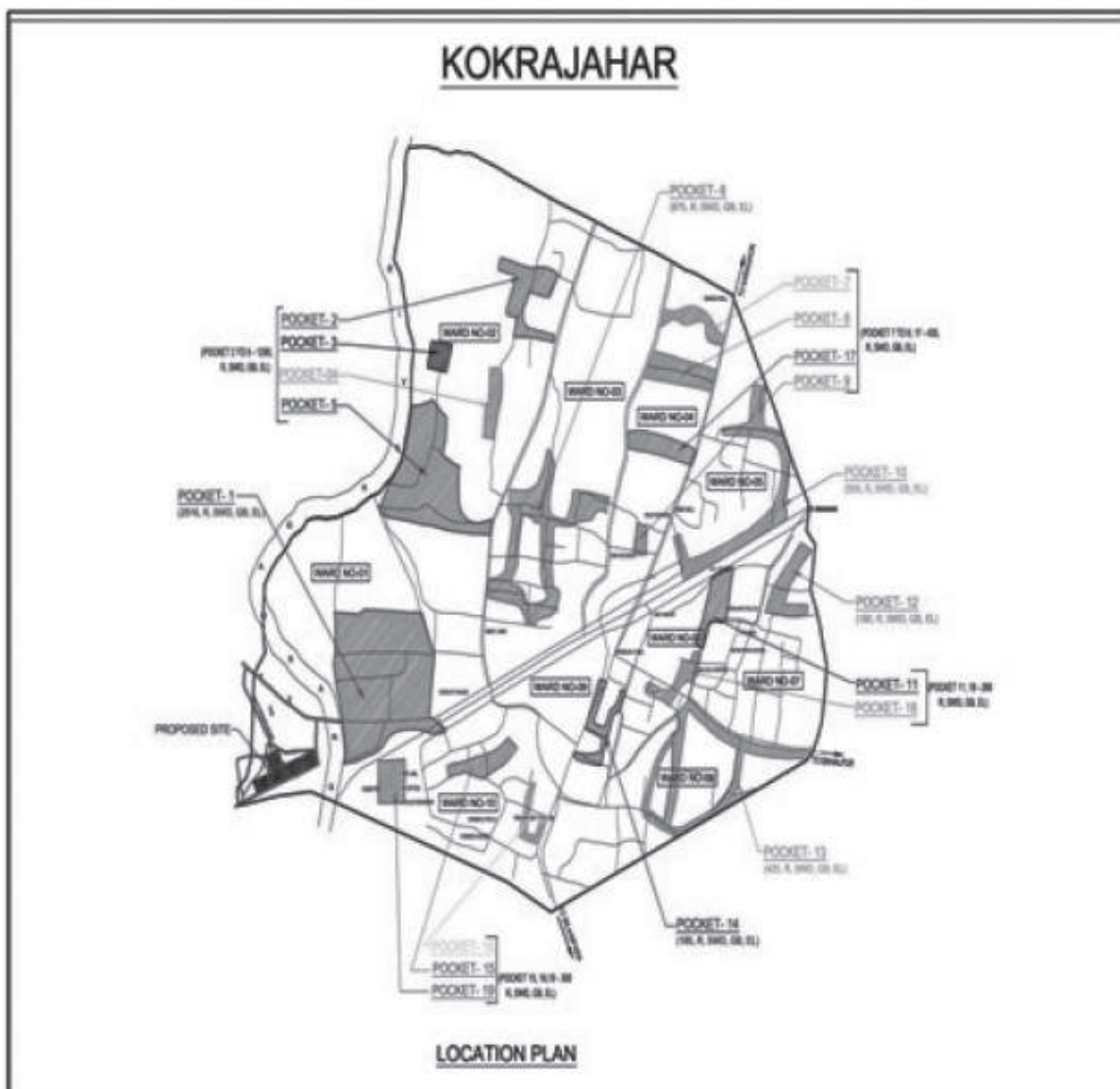
*Source: Census of India, 2011*

The housing status is shown at Table 30 which shows that the permanent houses constitutes only 38.40% (8,095) in Master Plan Area, 9.83% (730) in Municipality Area, and 28.63% (3,901) in Master Plan Area excluding Municipality.

#### 8.4.4. Kokrajhar- Slum Scenario:

It is observed that there is slum development within the municipal limit of Kokrajhar. The slum population is at risk where 23.94% of the population lives in the slum area according to 2011 census. The geographic condition of the town is such that mostly all the slum areas are affected in floods. Slum pockets with tentative demarcation are shown in the map.

Figure no. 4 : Slum Pockets in Kokrajhar



Source : Aapil Planning Consultancy

The town has ten slum pockets out of which five pockets are distributed along the periphery of the town in ward number 9, 3, 8 and 10 and four in the center of ward number 2,4,6,7 and another in between on the south western side in ward number 5. Most of the land where the slums are located belong to the individual people. Out of the ten slum pockets Gaumagar in ward number 1 on the extreme west side has the highest population of 960 persons with 71 households. The slums of Kokrajhar unlike the other pockets are relatively homogenous in terms of religion and languages. Second generation migrants from West Bengal, Bihar and Bangladesh too seems to constitute a sizable population. With the upcoming of the hydro electrical power project of Salakati in 1988, some laborers came and lived in the slums in search of shelter and livelihood. The distribution pattern within the pockets display typical characteristics in terms of congestion and poor housing structure.

*Table 31: Comparison of ward to slum population*

Ward No.	Name of slum pocket / Name	Ward No.	Ward Population	Slum Population	% of slum population to ward population	% of Slum population to town population
1	Slum Settlement No:1	1290	3961	2916	73.62	9.36
2	Slum Settlement No:2 to 5	2	3591	1290	35.92	4.14
3	Slum Settlement No:6	3	5233	875	16.72	2.81
4	Slum Settlement No. : 7 to 9, 17	4	2167	430	19.84	1.38



5	Slum Settlement No:10	5	4482	595	13.28	1.91
6	Slum Settlement No:11 and 18	6	2952	280	9.49	0.9
7	Slum Settlement No:12	7	1753	160	9.13	0.51
8	Slum Settlement No:13	8	2125	425	20	1.36
9	Slum Settlement No:14	9	2457	185	7.53	0.59
10	Slum Settlement No:15,16, 19	10	2443	300	12.28	0.96
	<b>Total</b>		31164	7456	23.93	23.93

*Source: Aapil Planning Consultancy*

In Kokrajhar, slums seem to crop up in various types of land. Durgabari, College Road, and Hatimatha are the slums which are located in forest land. On the bank of river Gaurang, slums are seen to grow they are Gamagar, Shantinagar and Bhatgaon. Station Road is a slum which is located in railway land. Out of 100 surveyed households of Kokrajhar slum pockets 75 percent live in their own land, 24 percent in rented land and remaining 1 percent in government land. In the slums, at Kokrajhar town there were more family migration from the interior of the district to the slums of the town. In

conformity with these characteristics of slums in any other town Kokrajhar slums also have a large percentage of migrant population (47 percent).

#### **8.4.5. Proposals**

**Housing:** An additional area for housing of 11,516 units is proposed.

**Slum:** As the part of the slum development exercise, Proposal for the financial requirements to the Kokrajhar Municipal Board for the establishment of the 384 new dwelling units as well as the infrastructure capacity development of the existing ones.

Any new housing development plan must resume the percent of area standards given by Central Government.

### **9. ENVIRONMENT AND NATURAL HAZARDS**

#### **9.1. Vision**

The Kokrajhar town to be one of the best pollution free, neat and cleanly managed town.

#### **9.2. Environment-Sensitive Areas**

The district is situated in a humid sub-tropical climate, which is the characteristic of the lower Brahmaputra Valley of Assam. There is high rainfall and humidity. The district also has one of the largest concentrations of forest in the state. The soil in the district is fertile and suitable for paddy cultivation.

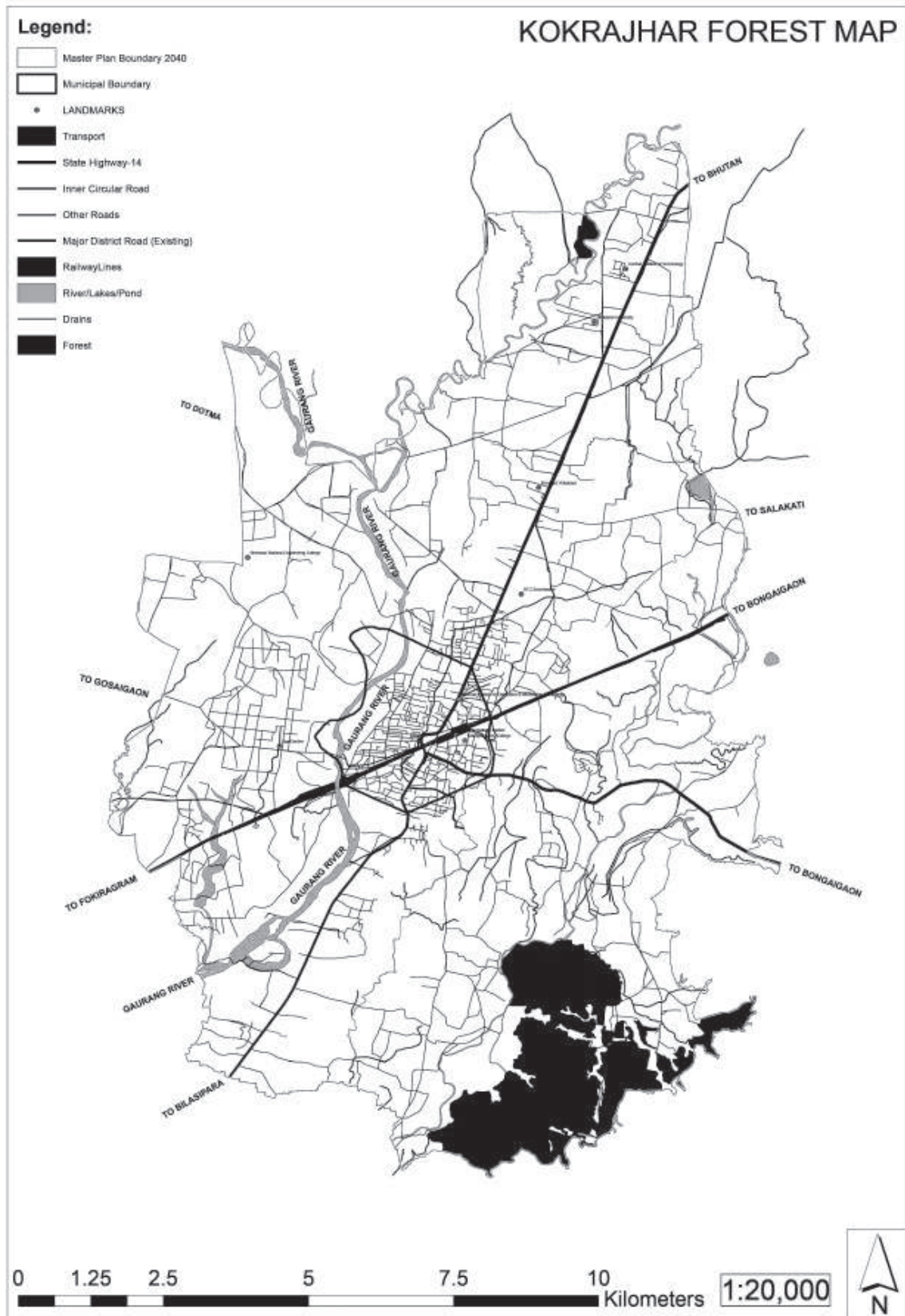
The water that flows along natural dongs and canals are the main source of irrigation. The soil throughout the district is composed of sand and clay in varying proportion ranging from pure sand in the riverbed to soft clay in different parts. The rocks found in the district are all sedimentary. In the southernmost part of district there are two small hills that are mostly composed of metamorphic rocks.

### 9.2.1. Forests

In ancient time, the present Kokrajhar town was full of forest. Originally the town started along the bank of Gaurang River by wood merchants and over years has left the topography complete altered. Kokrajhar forests were one of the main sources of timber produce in Assam. Forests in and around the planning boundary is very rich in flora and fauna.

Forest being one of the most prominent features of Kokrajhar district; it is very important to preserve this asset and prevent further degradation. The present estimated area under reserved forests is roughly 1,719 sq. km, throughout the district and a only 6.66sq.km inside the planning boundary. Though records show that about 55 percent of the total geographical area of the district is under reserved forest, the actual position has dwindled to some extent due to relentless felling of trees by unscrupulous elements and encroachment of reserved forest.

Map no.5: Forest Map



Source: Generated by Author

### 9.2.2. Rivers

The Bhutan hills are the main source of water for a number of rivers that flow through the district and act as tributaries of the mighty Brahmaputra that flows from east to west far from the southern boundary of Kokrajhar district. Rain water flows down from the hill tracts of Bhutan and along the foothills and reserve forests of the district to feed the important rivers of the district that flow from north to south viz. the Champamati, the Gaurang, the Tipkai and the Sonkosh.

The planning area for the Master Plan of Greater Kokrajhar receives water for irrigation and other purposes mainly from Gaurang River and three canals of Tarang River. Presently untreated waste water from the town is directly released into the canals and river which is going to get worse once the population grows. No form of pollution monitoring is present in the town.

### 9.3. Water and Air Pollution

No monitoring stations set yet to check and control any form of pollution.

### 9.4. Natural Hazards

#### 9.4.1. Floods

Predominantly only the flood plains of Gaurang River get flooded. But recently due to the adverse effects of urbanization occurrence of water logging is taking place. Since the capacity of the canals, drains and dongs do not suffice the natural drainage it is important to take immediate action to increase the capacity by means of desilting, cleaning of solid waste and check on the reclamation of watershed channels.

#### 9.4.2. Forest Fire

Due to close proximity of habitat and forest occurrence of forest fire is inevitable. Disaster management preparedness measures must be taken by the disaster Management board.

### 9.4.3. Proposal

- Pollution control board to be set up as soon as possible. Locations of monitoring centres are to be developed subsequently in different phases as per need and technical surveys.
- All ecologically significant natural features are to be demarcated, protected and conserved.
- Active Monitoring Centres must be constructed especially around the industrial zones and hospitals.

## **10. TOURISM AND HERITAGE CONSERVATION**

### **10.1. Tourism**

Tourism is a people industry. It develops and supplies a range of facilities, services and experiences to meet the needs, aspirations and expectations of the visitors. Its importance was recognized in the Manila Declaration on World Tourism of 1980 as "an activity essential to the life of nations because of its direct effects on the social, cultural, educational, and economic sectors of national societies and on their international relations. Tourism plays an important role in the following aspects:

- **Source of foreign exchange**
- **Employment opportunities: tourism generates employment opportunities to skilled, semi-skilled and un-skilled manpower.**
- **Sources of public and private income: tourism generates revenue to the government in the form of taxes like sales tax, service tax etc. It creates livelihood to people dependent on handicrafts and arts etc by attracting the tourists.**
- **Cultural exchange: tourism industry facilitates exchange of cultural values, traditions, languages, art etc. from one place or country to another.**
- **Publicity of nation: Tourism helps to publicize the country in different parts of the world.**

#### **10.1.1. Vision**

The Kokrajhar Master Plan Area to be full of entertainment facilities, parks and tourist spots where the tourists can participate in entertaining facilities, mellas, parks, museums, play entertaining games or competitions, enjoy in site seeing, cultural programmes etc.

#### **10.1.2. Major Tourist Attractions in and around Kokrajhar**

Chakrashila Wild Sanctuary was first declared as reserve forest in 1966 and on July 14, 1994 it was recognized with the status of sanctuary by the Government of Assam. A

local environmental activist group, Nature's Beckon played a vital role for this recognition.

The sanctuary covers an area of 45.568 km<sup>2</sup> (4556.8 hectares). It is around 6 km from Kokrajhar town, 68 km from Dhubri town and 219 km from Lokpriya Gopinath Bordoloi International Airport, Guwahati. The sanctuary is mainly a hilly tract running north-south and there are two lakes (Dheer Beel and Diplai Beel) on either side, which are integral to the eco-system of the sanctuary. The lower hilly reaches are covered with sal coppice regeneration while middle and upper reaches are covered with mixed deciduous forests. The sanctuary has some tourist accommodation facility at Choraikhola, Kokrajhar and also provides facilities for bird watching, forest trekking, and wildlife and nature photography.

Different kinds of mammals and birds, twenty-three species of reptiles including snakes, lizards and turtles, more than forty species of butterfly are found in this sanctuary. Some species of mammals recorded in this sanctuary are Indian short-tailed mole, Indian flying fox, short nosed fruit bat, Indian false vampire, Indian pipistrelle, rhesus macaque, Chinese pangolin, Asiatic jackal and Bengal fox. Hornbills are also spotted here. It is also a safe haven for a variety of endangered animals.

A total of 119 species of birds have been recorded in the Chakrashila Wildlife Sanctuary. This number includes three globally threatened species.[8] Some of the species recorded here include black francolin (*Francolinus francolinus*), jungle bush quail (*Perdicula asiatica*), lesser whistling duck, cinnamon bittern, Indian pond heron, cattle egret, purple heron, red-necked falcon, red-headed vulture, greater spotted eagle, and bronze-winged jacana.

Manas National Park is the major tourist attraction centre around Kokrajhar. The footfall for the Park has to pass through Kokrajhar from other parts of India other than the North east in its tourist circuit. Kokrajhar being the headquarter of BTAD and having a dominating mass of indigenous tribe could be developed as a cultural hub showcasing the beautiful traditional colourful practices.



### **10.1.3. Goals and Objectives**

**Bodoland Tourism aims at the promotion of regional development along with Bodoland's rich wildlife sanctuaries and impregnable forests and the rich cultural traditions spreading around the BTAD region providing a congenial atmosphere for tourism development strengthening the infrastructure and hospitality, tourism products and services, travelling circuits, focusing a clean tourism destination, in the world map. The goals and objectives of the Tourism department are as follows:**

- **To promote a responsible and community based tourism.**
- **To minimize the environmental impact by promoting sustainable tourism.**
- **To generate economy among the local communities and development of region.**
- **To ensure sustainable development of tourism in Bodoland – environmentally, socially, culturally and economically.**
- **Identify and develop a mega tourist destination and well connect with major travel circuits.**
- **Generate skilled and employable youths for manning jobs in tourism, hospitality and other allied industries in Bodoland.**

### **10.1.4. Tourism Vision – 2040**

**The Tourism infrastructure facilities should be developed in such a way that the tourists or the visitors can be fully busy in the adventurous activities. The infrastructure facilities should have unique features, unique design, unique look, unique facilities, and unique entertaining activities with full safety measures. The tourism infrastructure facilities like museums should be full of historical items, showing historical moments with pictures, demonstrating historical real stories with voices and statues or videos, depicting historical conflicts of Bodo martyrs about how wars of Bodoland movements started and ended. The tourism infrastructure facilities like adventurous entertainment should be designed and developed in a way to enable participants to enjoy with visible risk but with high safety and comfort that makes a sense of high enjoyment and entertainment for life time memory. The tourism infrastructure facilities also should be developed in such a way whereby the people enjoy and travel a distance to make a real journey for their work. There should also have facilities for cultural shows and**

attraction of people at tourist spots with site accommodation facilities. The tourism spots or destinations may be developed in the beautiful natural places, water lakes, rivers, religious places like temple or ashrams, heritage or historical places, arts and cultural places, health care, educational places etc. Any development of tourism places should be on a commercial basis so that the investment in the development of tourism can be recovered by the revenues from the tourist.

#### 10.1.5. Tourism Status

The Bodoland Tourism has many tourism infrastructures within the range of 10 km radius for the development of tourism destinations and products to create a new outlook to Kokrajhar town as well as hotspots to Bodoland. As there are many places and spots including the temples, river side's, forest reserves, tea estates, villages for rural tourism, farms, beels, etc., it is needed to emphasis in the inclusive tourism projects for the development of tourism and the hospitality industry. The tourism infrastructure projects successfully completed are as follows (*Source: Tourism Department, Kokrajhar*):

- Bodoland Martyres Cemetery, Debargaon build on as 45-bigha plot, a “Dream Project” of the Heros and heroines who laid down their lives in pursuance of their dream of a separate Bodoland. It is in bronze statues of 15 years old Late Sujit Narzary and Helena Basumatary – the first martyrs of the movement who laid down their lives for the cause in 1987 and 1988 respectively and Bodofa Upendra Nath Brahma, Guide Basumatary, Bir Chilagang Basumatary, Bineswar Brahma, Haigwra Bodosa, Swmla Basumatary, Horkhab Narzary and Baliram Boro, the cemetery of 1,605 tombs inscribed with names and addresses of those who made the supreme sacrifice between 1987 and 2003.
- The Bwisagu Festival is one of the most cherished festivals of the Bodos and is celebrated in the month of Baisakh (Mid-April) for 7 days to signify the welcoming of New Year. Various rituals like “Gwkha Gwkhwi Janai” or eating of bitter and sour vegetables on the day of Sankranti, Cattle rites, offerings to Gods and Goddess are performed with great pomp and show. During this month Boukhungri festival is celebrated for 3 (three) days inclusive in Sports, Culture and Traditions, Foods & Cuisines attracting the Boukhungri Tourist Zone.

- The department has initiated Training Program for skilled development in “Housekeeping and Food & Beverages courses of Hospitality being sponsored by Tourism Department of BTC in collaboration with Don Bosco Institute, Guwahati where 100 students have successfully completed the courses and initiated Paragliding Training Program to enhance the Bodoland Tourism activities.
- Choraikhola Guest House, Choraikhola and Tourism Guest House, Gaurang complex, Kokrajhar are available as the tourist facilities developed by the Tourism department, BTC.

## 10.2. Proposals

### 10.2.1. Marketing strategies

- Tourism awareness program
- Advertisement of Kokrajhar tourism in Guwahati, Kaziranga and Majuli which are major tourist spots in Assam in order to tap a share of Manas Bird Sanctuary tourists to Kokrajhar.
- Incentives for film industries through which areas of natural scenic beauties can be exposed which are not yet explored.

### 10.2.2. Tourist circuits

- Eco tourism circuit involving various fissile recreational activities shall be marked.
- Tourist circuit within the city along with tourism infrastructure shall be marked.

### 10.2.3. Tourist related infrastructure

Improving tourism related infrastructure like refreshment points, toilets, parking etc.

- Bringing in Tourist travels/ cabs in the city which covers all the circuits in Kokrajhar.

- **Setting up of Tourist information, refreshment centers, hoardings and signage on the way to Kokrajhar.**

#### **10.2.4. Promotion of Tourism**

- **Promotion of water sports and adventurous sports like camping, trekking, paragliding etc.**

## **11. LAND USE ZONING PLAN**

### **11.1. Vision**

Every part of land of the town to be properly protected from encroachers, use of land to be properly planned, records of land to be properly maintained in digital forms, transfer of land through buying or selling to be properly, physically inspected and recorded in Government offices, the use of land to be properly planned and owners of the land to be properly educated about the rules of use of land.

### **11.2. Land Use Plan**

Land use refers to the use to which a particular piece of land is put and how different human activities are distributed over space. Land use involves the management and modification of natural environment or wilderness into built environment such as fields, pastures, and settlements. It also has been defined as "the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it.

Land is the basis for most biological and human activities on the earth. Agriculture, forestry, industries, transport, housing and other services, all use land as a natural and an economic resource. Land is also an integral part of ecosystems and indispensable for biodiversity and carbon cycle.

The study of land use distribution is of prime importance for the understanding of a city structure and its growth pattern. The study of distribution of various land uses dictates the social, economic and other aspects of the growth of the city. This study aims to determine the present land use distribution of the city and thus to determine the socio-economic and physical growth of the city.

### **11.3. Existing Land-use divisions**

Based upon extensive Land-use survey and analysis, suitable categories were given to different Land-uses as per URDPFL. The function or functions that human apply to any piece of land defines its land use. It could be a developed land of rural/urban built

environment or it could be a natural environ or absolute untouched wilderness. The different types of Land-uses that could be categorized in the Existing Master Plan are:

#### **11.3.1. Residential Zone**

Absolute residential areas with no major commercial or industrial zones are marked as residential.

#### **11.3.2. Commercial Zone**

This zone allows a range of commercial uses including retail shops, offices, small-scale warehouses, and the hospitality industry that includes hotels and entertainment venues.

#### **11.3.3. Public and Semi-Public Zone**

Health, Educational, Cultural, Government Buildings, sports and open space facilities will be allowed in this zone.

#### **11.3.4. Industrial Zone**

These are the areas which typically involve industrial activities. To create a conducive environment for development Industrial Zone is created. Only industrial activities are allowed in the demarcated industrial land use.

#### **11.3.5. Recreational Land Use**

In order to ensure that the city is an attractive and desirable place to live, a high proportion of the developable area is proposed for open spaces and recreational activities. Here recreational activities, parks, riverfront development, playground, theme parks and exhibition grounds are marked as Recreational.

#### **11.3.6. Agriculture Zone**

Activities such as crop production, animal husbandry, aquaculture, agro-forestry, and horticulture are marked as land use area.

### **11.3.7. Waterbodies**

**Waterbodies Zone indicates all existing waterbodies, i.e. rivers, streams, lakes, and wetlands, as indicated in the topographical sheets published by the Survey of India, the State Irrigation Department or Revenue Department or other competent authorities. The boundary of the waterbodies relate to the full tank level as indicated in relevant maps, covering both perennial and non-perennial parts when such distinction exists.**

### **11.3.8. Forest**

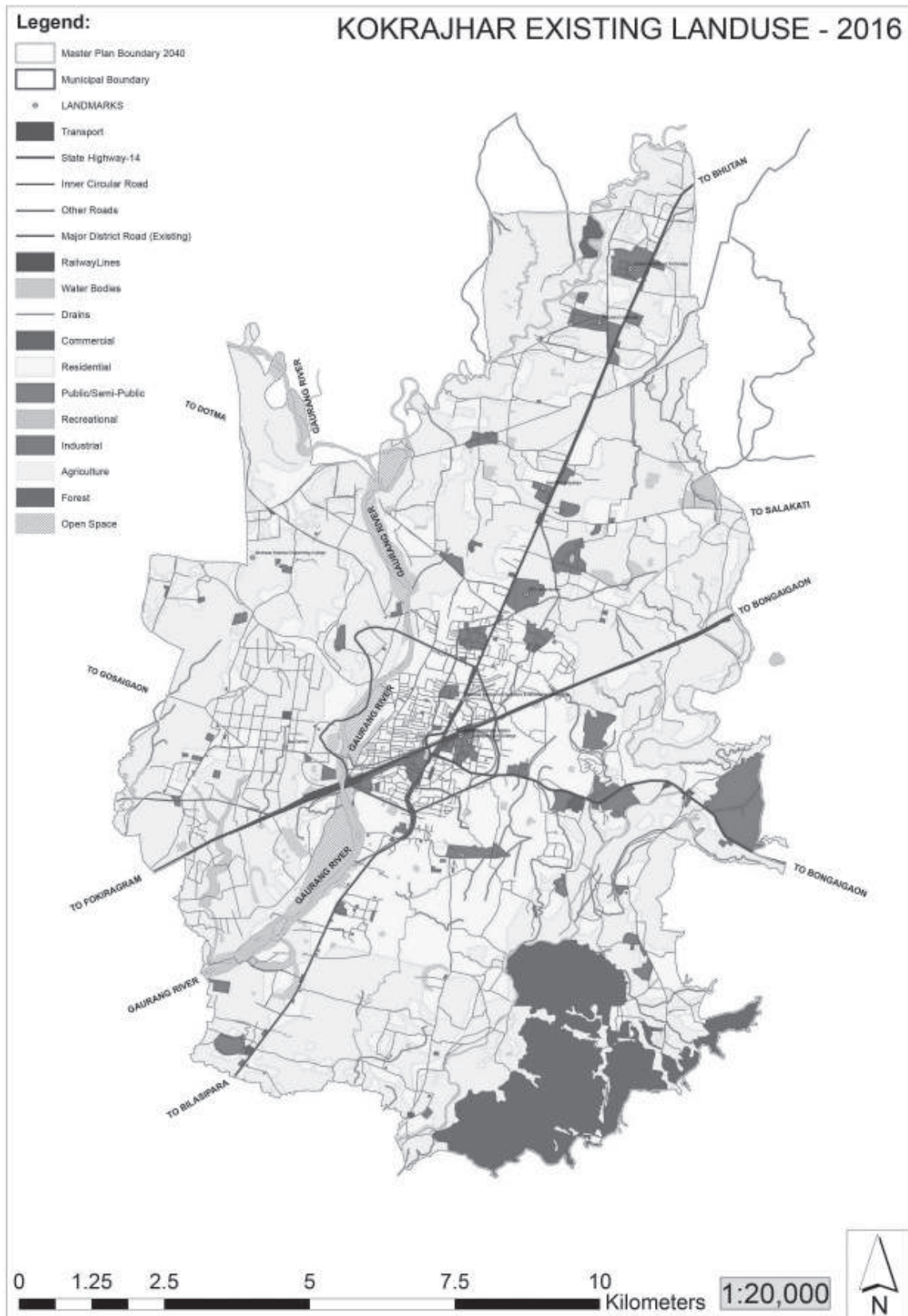
**All reserve forests and forests as notified by the forest department are earmarked as Forest Zone in the proposed land use map.**

### **11.3.9. Open Spaces**

**In Kokrajhar Master Plan area flood plains of Gaurang and Taurang River along with different waterbodies which serve for irrigation purposes and also could be an asset to the city as water recharge points are marked as open spaces.**

## **11.4. Unit-wise land use break-up**

Map no.6: Existing Land-use Map



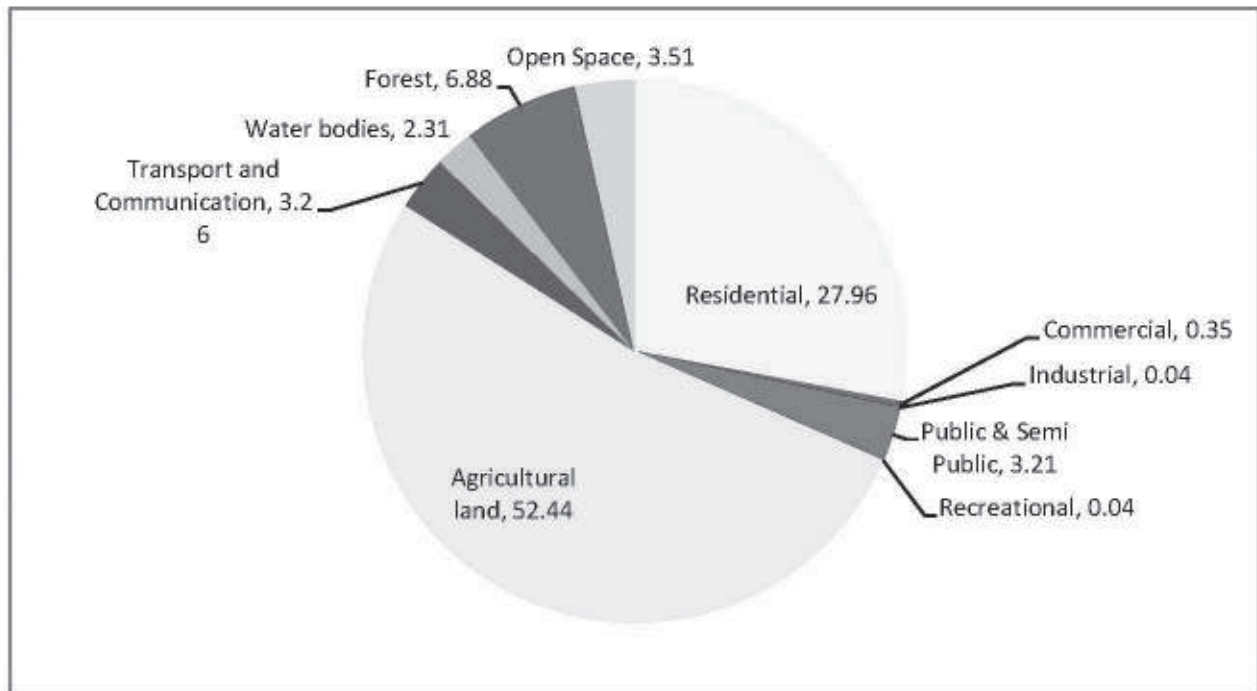
Source: Generated by Author



*Table 32: Existing Land Use (Master Plan Area) 2016*

LAND-USE	AREA (SQ. KM.)	PERCENTAGE (%)
Residential	35.06	27.96
Commercial	0.44	0.35
Industrial	0.049	0.04
Public & Semi Public	4.02	3.21
Recreational	0.05	0.04
Transport and Communication	4.08	3.26
Agricultural land	65.75	52.44
Water bodies	2.9	2.31
Forest	8.62	6.88
Open Space	4.4	3.51
<b>Total</b>	<b>125.37</b>	<b>100</b>

*Source: Primary Survey*

*Figure no.5: Percentage of Existing Land-use Distribution, 2016*

Source: Primary Survey

### 11.5. Land-use status

The land properties are being sold by the owners to the buyers on mutual negotiation and agreement without any proper planning guidelines. The sellers of land find difficult to get buyers easily and the buyers also get difficult to get sellers easily for land properties. The Private agents of land are engaged voluntarily to find out sellers and buyers of land properties and take high profits as commission at their own will. The sellers also in need of money sell the land at low cost to agents and the buyers also buy the land at high price in need of land, thereby the agents are in good advantage to earn profits. This increases the prices of land to very high level. Some illegal kinds of agents also grow voluntarily without having any good knowledge or intention of giving good services to the clients and sell the land properties to more than one buyer and escape with huge amount of money. These activities of illegal agents create more legal cases and legal conflicts among the buyers and sellers during the course of urbanisation. When the lands are sold, the sellers do not develop their plots of lands with proper approach roads, boundaries, and drainage etc. due to lack of knowledge or due to lack of guiding rules from the local authority. This creates unplanned or illegal growth of urbanisation which cannot be controlled later on.

Most part of the Government lands like forest lands are under the control of encroachers or illegal migrants due to lack of proper Government land possession and control system. When Government lands are encroached by illegal migrants the departments do not take necessary action in time and remain silent for many years till the requirement of lands for development purposes. By the time the migrant encroachers of the land become more settled with constructed buildings and infrastructures and eviction of such occupiers become difficult and impossible with time. The Government has no proper digital system of land possession, monitoring, recording and transfer facilities.

### 11.6. Land-use Proposal

Depending upon the need of the township and keeping in mind the economic, social and environmental growth of the town ship proposals were made to progress towards the standards provided by URDPFI.

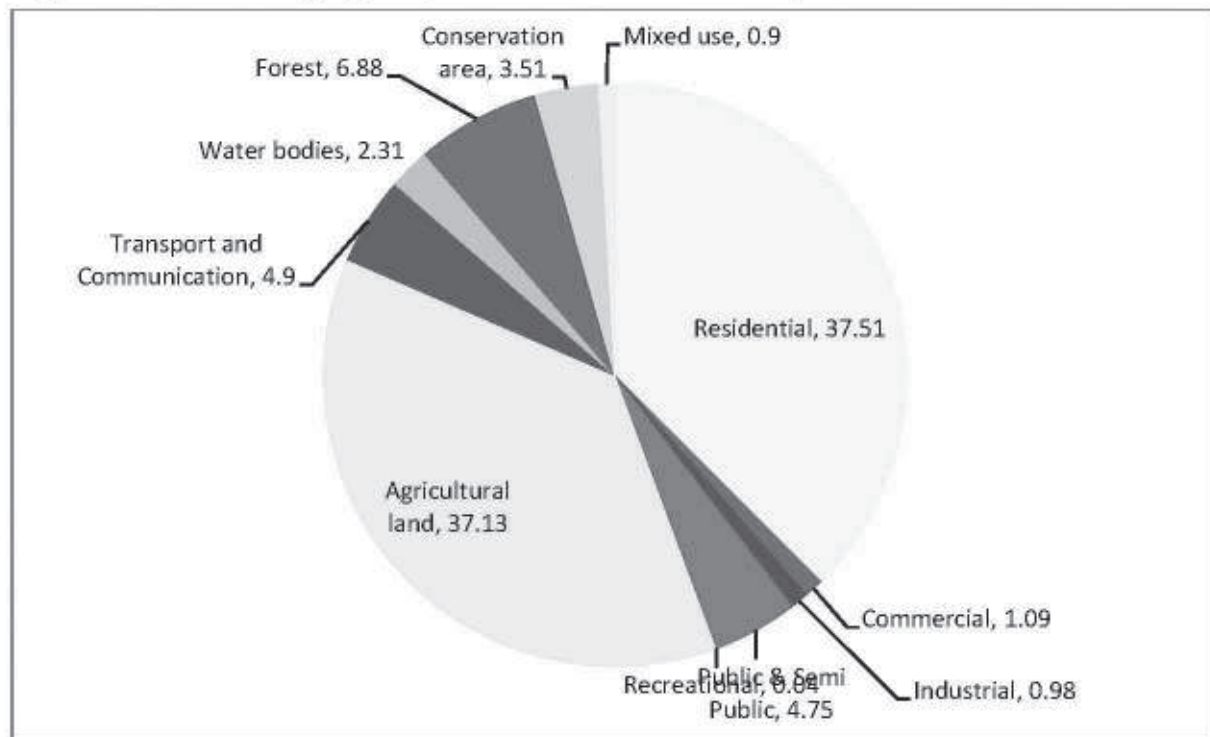
*Table no. 33: Proposed Land-use distribution.*

LAND-USE	Proposed Land-use Percentage 2016	Proposed Percentage as per URDPFI
Residential	37.51	40-45
Commercial	1.09	3-4
Industrial	0.98	8-10
Public & Semi Public	4.75	10-12
Recreational	0.04	18-20
Transport and Communication	4.9	12-14
Agricultural land	37.13	Balance
Water bodies	2.31	Balance
Forest	6.88	Balance

<b>Conservation area</b>	<b>3.51</b>	<b>Balance</b>
<b>Mixed use</b>	<b>0.9</b>	<b>Balance</b>

*Source: Prepared by Author*

*Figure no.6: Percentage of Proposed Land-use distribution, 2040*



*Source: Generated by Author*

### 11.7. Proposed Land-use area

In order to meet the growing need and direct the city growth into a planned direction Land-use for 2040 has been proposed. With the aim to achieve the set standards by URDPFI for Medium Town II, Land-use distributions were made. The following are the key changes in the Land-use:

- Industrial area next to forest has been relocated next to the MDR leading to Salakathi keeping the protection of forest ecosystem in mind and better connectivity.
- Two Ring roads/Major District roads have been proposed around the Master Plan to help the city grow in planned direction and better connectivity.

- By-pass roads has been proposed to connect these Ring Roads especially around major land marks and administration head i.e. BTC.
- Recreational area has been proposed in and around the city both for the purpose of recreation and environmental protection.
- Public and Semi Public areas are proposed to hold the growing infrastructural needs.
- Looking into the typical existing urban fabric Mixed Use category has been introduced specifically around the core of the city.
- Commercial Land-use is increased around the city to looking into the socio-economic status of the city.
- Conservation Zone has been introduced around natural features to check encroachment and further degradation due to urbanisation. Main features include
  - Flood plains of Gaurang and Taurang River.
  - Buffer zones to all stream lines and major drainage channels
  - Seasonal water bodies which serve as ground recharge points and also used for irrigation purposes, scrublands and low lands.
- Infrastructural proposal locations in terms of Water Treatment Plant (WTP), one Sewerage Treatment Plant (STP) and a Bus Terminal (BT) have been proposed.
- To meet the projected population's housing needs new residential areas has been proposed.

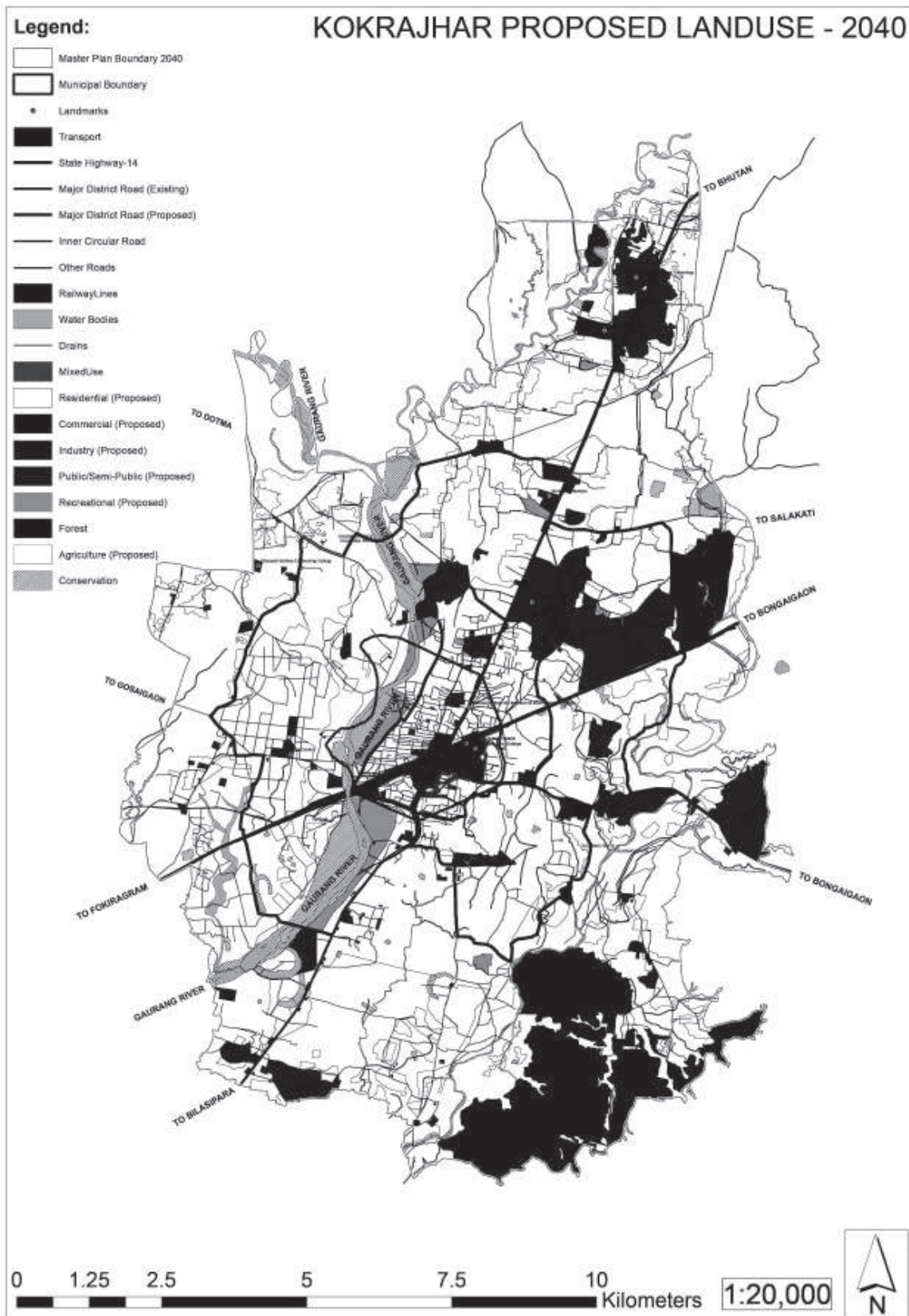
The proposals so made are at a draft stage and are prior to change after the feasibility study of the various aspects of planning and engineering.

*Table no. 33 : Proposed Land-use area*

<b>LAND-USE</b>	<b>EXISTING AREA (SQ. KM.)</b>	<b>PERCENTAGE (%)</b>	<b>PROPOSED AREA (SQ. KM.)</b>	<b>PERCENTAGE (%)</b>	<b>PROPOSE ADDITION OF</b>
<b>Residential</b>	<b>35.06</b>	<b>27.96</b>	<b>46.89</b>	<b>37.51</b>	<b>11.83</b>
<b>Commercial</b>	<b>0.44</b>	<b>0.35</b>	<b>1.36</b>	<b>1.09</b>	<b>0.92</b>
<b>Industrial</b>	<b>0.049</b>	<b>0.04</b>	<b>1.22</b>	<b>0.98</b>	<b>1.171</b>
<b>Public &amp; Semi Public</b>	<b>4.02</b>	<b>3.21</b>	<b>5.94</b>	<b>4.75</b>	<b>1.92</b>
<b>Recreational</b>	<b>0.05</b>	<b>0.04</b>	<b>0.05</b>	<b>0.04</b>	<b>0</b>
<b>Transport and Communication</b>	<b>4.08</b>	<b>3.26</b>	<b>6.12</b>	<b>4.9</b>	<b>2.04</b>
<b>Agricultural land</b>	<b>65.75</b>	<b>52.44</b>	<b>47.54</b>	<b>37.13</b>	<b>-18.21</b>
<b>Water bodies</b>	<b>2.9</b>	<b>2.31</b>	<b>2.9</b>	<b>2.31</b>	<b>0</b>
<b>Forest</b>	<b>8.62</b>	<b>6.88</b>	<b>8.62</b>	<b>6.88</b>	<b>0</b>
<b>Conservation area (Open Space)</b>	<b>4.4</b>	<b>3.51</b>	<b>4.4</b>	<b>3.51</b>	<b>0</b>
<b>Mixed use</b>	<b>0</b>	<b>0</b>	<b>1.12</b>	<b>0.9</b>	<b>1.12</b>

*Source: Prepared by Author*

Map no. 7: Proposed Land-use



Source: Generated by Author

## 12. CITY IMAGE

Town structure is defined by how the land uses are arranged in a demarcated area. While town image could be explained how people perceive it in their mind considering the few basic elements of urban design i.e. pathways, nodes, districts, edges and landmarks. In order to achieve the set visions for Kokrajhar town, it is very important to improvise the town structure and image in order to support planned growth.

### 12.1. Town Structure

#### 12.1.1. Existing Town Structure

Kokrajhar town is mostly plain land except the foothills on the south side. The township developed along transport corridors. Dominated by agriculture activities most of the people in the township resides in pockets. The township is emerging as an administrative and cultural and economic head of the region, mail the BTAD territory.

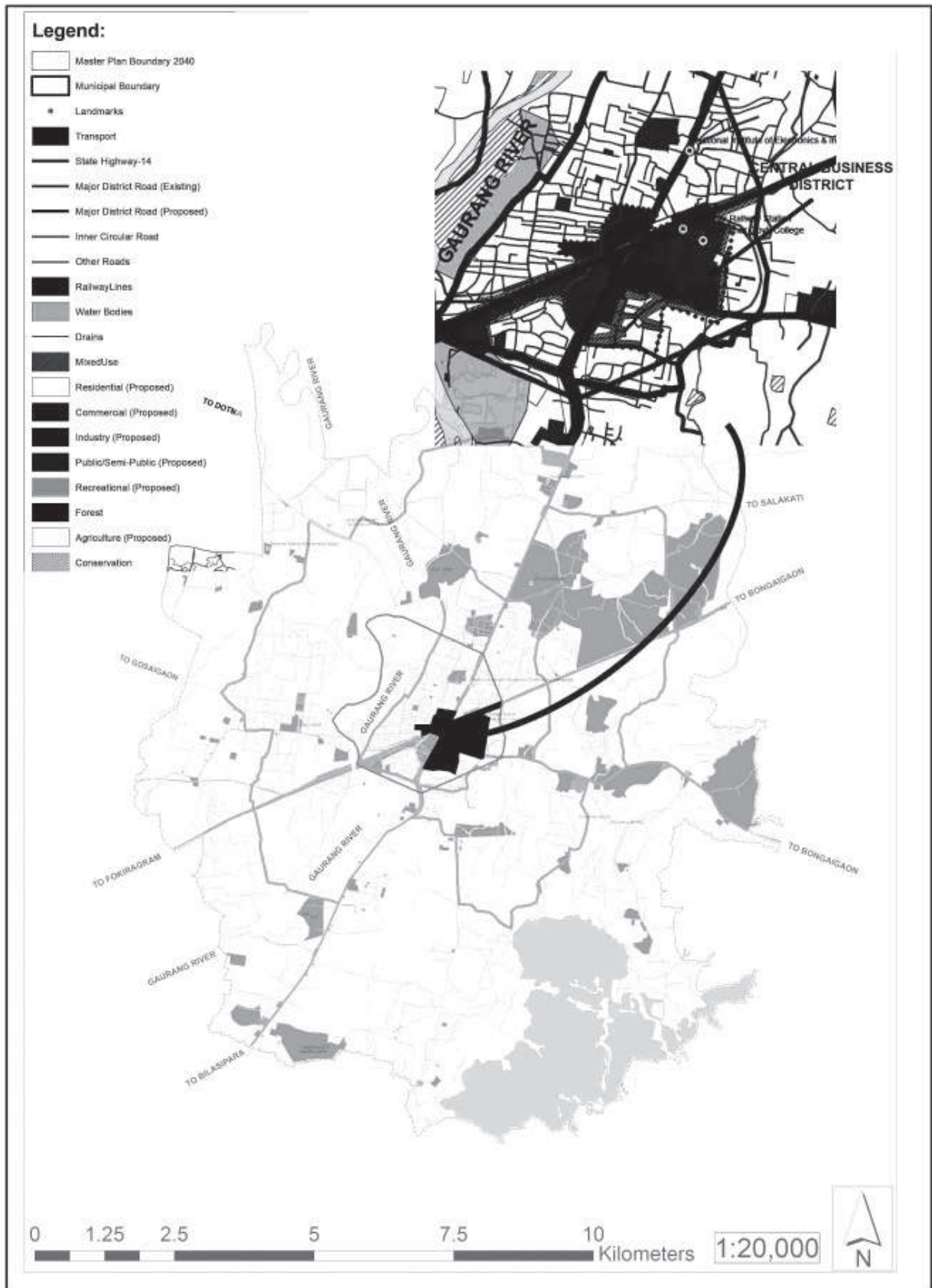
Apart from the central commercial lanes/ area, the other nuclei that have formed in the city are the BTC Headquarters. It is very important to develop the city image as defined in the vision statement. However, a hierarchical form of urban development is absent in the City Structure. Several proposals were made to improve the city image. Major of them are as follows:

#### *Central Business District*

The aim of demarcating the Central Business District is to develop it as the main financial and economic centre, as well as a leading hub of economic activity for the complete BTAD region.



**Map no.6: Proposals for Central Business District**



Source: Generated by Author

### *Urban Renewal*

Urban Renewal plan must be made along with the development of the CBD. Since core area is the densest and the oldest of the settlement, its built environment needs to be reviewed periodically and redeveloped as per need.

### *Riverfront Development*

The Eastern side of the Gaurang River if developed as riverfront development, will not only conserve the banks but will also influence the town's image as it will serve as a major recreational zone especially for social and economic activities.

### *Water park*

Water park could be developed to attract tourists from the complete region.

### *Promotion of eco-tourism around Chakrasilla Hills*

Development of Eco-tourism will help in conserving the forest lands and educating people about the importance of ecosystem. It will also increase the tourist footfall and promote socio-economic activities.

### *Development of Ring Roads*

The ring roads will take off the traffic from the roads of the core areas avoiding any form of congestion inside the town. It will also enhance the connectivity of the town to the rest of the region and by virtue improve economic and social activities.

### *Town Level*

One of the major goals of the plan is to create a unique image for the city of Kokrajhar befitting that of a State Capital. This can be achieved through the creation of landmarks and interesting urban forms. Some of the major city level projects identified for enhancing the capital city image of Kokrajhar are as under:

#### — Education and Research Hub

The Education and Research Hub shall contain regional-level institutions for research activities. A Medical college with a Multi-speciality Hospital covering 15 ha shall also be

located within this area. The hub shall have Institutional area, residential area, sports and cultural area and landscape component. Its details are as under:

**Area : 107 Ha**

— Health

As per IPHS 2012, the no. of beds required for a city - Average length of stay in a hospital as 5 days. It is evident that beds available in the city hospitals are not sufficient. An additional 400 no. of beds to be accommodated in the city.

— Multi-Speciality Hospital

**Beds: 200 minimum**

**Area: 9 Ha**

— Intermediate Hospital ( Category A)

**Beds: 200 minimum**

**Area: 3.7 Ha**

Also the existing Civil hospital and the Rural Hospital must increase its capacity.

— Exhibition-cum-Fair Ground

Kokrajhar is the cultural and economic hub of the whole BTC. There are a number of festivals and fairs held in the city. Considering the number of tourists visiting these fairs, it is proposed to develop an exclusive exhibition cum fair ground to organize fairs, exhibitions and shows and events for cultural as well as economic benefits. Its area and location are as under:

**Area : 412 Ha**

— Parks and Playground

One unit of District park is proposed. Its area and location are as under:

**Area: 25 Ha**

Parks and playground and other Open spaces are provided accordingly:

4. For each housing cluster .5 Ha Land is allotted for green space

5. For Eah neighbourhood 1 Ha land is allotted as park space
6. One unit of Community park is proposed of 5 Ha.

**Other Controls:**

- 1) Open spaces/ maidans should be spatially distributed and multiple function in time to be promoted.
- 2) In any layout or sub-division of land measuring 0.3 Ha or more in residential and commercial zones, the community open space shall be reserved for recreational purposes which shall as far as possible be provided in one place.
  - The minimum recreational space provided shall be 450 sqm.
  - The minimum average dimension of the recreational space shall not be less than 7.5 m and the length shall not exceed 2.5 times the average width.
- 3) Each recreational area and the structure on it shall have an independent means of access.
- 4) Any building line to be at least 3 m away from the boundary of recreational open space.
- 5) Zoological garden to be as per Central Zoo Authority provisions.

— **River Front Development**

River front development along the river Gaurang is envisaged to celebrate the beauty of the river and integrate it with the recreational green belt along it. In areas on new development along the river, a 200-m wide belt is proposed to maintain the serenity of the river.

— **Community Level**

At the Community level, an Integrated Community Centre (ICC) is proposed. A Community Centre shall contain:

- Community Hall for every unit population of 15000 is to proposed i.e. 10 units.
- Post office for every unit population of 15000 is to proposed i.e. 10 units.

- ◊ **Community Commercial Centre of about 5.4 ha land for 1 lakh population.**
- ◊ **Community-level Facility Centre containing Community level facilities, including Community-level Parks and Play areas.**
- ◊ **Housing Park for every unit population of 5000 is proposed.**

### **13. LAND USE ZONING AND DEVELOPMENT CONTROLS**

These regulations apply to the demarcated Master Plan boundary of Kokrajhar only. The zone delineation and the permissible land uses within zone and respective regulations for land use are properly co-related to achieve the vision of the Revised Master Plan of Kokrajhar, 2040 in order to achieve an era of organised growth.

The regulations proposed are prospective. The developments that are lawfully established prior to the coming into force of zonal regulations shall be allowed to continue as non-confirming uses unless it is having any form of negative impact to society or environment.

#### **13.1. Classification of Proposed Land Use Zones**

##### **13.1.1. Divisions**

###### **13.1.1.1. Residential Zone (R)**

Residential Zone is pure residential area in which major commercial and industrial activities are not allowed, however some for day-to-day needs of shopping uses should be allowed according to community needs and standards.

Activities that are allowed in residential areas are Residence – plotted, (detached, semi-detached and row housing) group housing houses, residential flat, residential-cum-work, hostels, boarding and lodging (accommodation for transit employees of Govt./ Local Bodies) houses, barat ghar/ marriage hall, community hall, old age home, police post, guest houses, crèches, day care centre, convenience shopping centres, local (retail shopping), medical clinic, dispensaries, nursing home and health centres (20 bed), dispensary for pets and animals, professional offices, educational buildings: (nursery, primary, high school, college), school for mentally/ physically challenged, research institutes, community centres, religious premises , library, gymnasium, park/tot-lots, plant nursery, technical training centre, yoga centres/health clinics, exhibition and art gallery, clubs, banks/ ATM, police stations, taxi stand/three wheeler stands, bus stops, electrical distribution depot, water pumping station, post

offices, hostels of non-commercial nature, kindergartens, public utilities and buildings except service and storage yards.

Activities that are restricted are: dharamshala, foreign missions, night shelters, petrol pumps, motor vehicle repairing workshop/garages, household industry, bakeries and confectionaries, storage of LPG gas cylinders, burial-grounds, restaurants and hotels, printing press, godowns/ warehousing, bus depots without workshop, cinema hall, auditoriums, markets for retail goods, weekly markets (if not obstructing traffic circulation and open during non-working hours), informal markets, multipurpose or junior technical shops, transient visitors camp, municipal, state and central government offices.

Activities that are prohibited are: heavy, large and extensive industries: noxious, obnoxious and hazardous industries, warehousing, storage go-downs of perishables, hazardous, inflammable goods, workshops for buses etc., slaughter-housing wholesale mandis, hospitals treating contagious diseases, sewage treatment plant/disposal work, water treatment plant, solid waste dumping yards, outdoor games stadium, indoor games stadium, shooting range, zoological garden, botanical garden, bird sanctuary, picnic hut, international conference centre, courts, sports training centre, reformatory, district battalion office, forensic science laboratory.

#### 13.1.1.2. Commercial Zone (C)

Total 0.35% of area is commercial in the existing Land-use, 2016. This zone allows a range of activities including Shops, convenience/neighbourhood shopping centre, local shopping centres, professional offices, work places/offices, banks, stock exchange/financial institution, bakeries and confectionaries, cinema hall/theatre, malls, banquet halls, guest houses, restaurants, hotels, weekly market, petrol pumps, go-downs and warehousing, general business, wholesale, residential plot-group housing, hostel/boarding housing, hostel, banks/ ATM, restaurants, auditoriums, colleges, nursing homes/medical clinics, pet clinics, religious places, offices/work places, commercial centres, research/training institute, commercial service centres/garages/workshop, baratghar/night shelter, weekly/formal markets, library, parks/open space, museum, police stations/post, taxi stand/three wheeler stands,

parking site, post offices, government/ institutional offices, telephone exchange/centres, warehousing and covered storage, research institutions. Existing industrial activities will be allowed to continue as non-confirming use but no new industrial related activities would be allowed in the earmarked commercial zone.

- **Retail Space:**

**Neighbourhood and Community Level Retail Space-** will be located near residential area that will include kiosks, shops, and community markets; where day-to-day needs of consumers, particularly food shopping and convenience goods will be accommodated.

**District and City Level-** Larger commercial centre, which includes the prime retail space represented by malls and high quality shopping space.

- **Office Space:**

Offices space will be required primarily for the indirect employment generated because of direct employment in the base industries and economic sectors. The following sectors will require office space:

- Transport and Storage
- Construction and Infrastructure
- Public Administration
- Utility Companies and Institutional bodies
- Banking and financial services
- IT based company and tele communication

It is assumed that the wholesale, retail sectors, banking and financial sectors will operate out of their own premises.

Activities that are restricted are: non-pollution, non-obnoxious light industries, warehousing/storage go-downs of perishable, inflammable goods, coal, wood, timber yards, bus and truck depots, gas installation and gas works, poly-techniques and higher technical institutes, junk yards, water treatment plant, railway yards/stations, sports/stadium and public utility installation, hotel and transient visitor's homes, religious buildings, hospitals and nursing homes.



Activities that are prohibited are: Dwellings except those of service apartment, essential operational, watch and ward personnel, heavy, extensive, noxious, obnoxious, hazardous and extractive industrial units, hospitals/research laboratories treating contagious diseases, poultry farms/dairy farms, slaughter-houses, sewage treatment/disposal sites, agricultural uses, storage of perishable and inflammable commodities, quarrying of gravel, sand, clay and stone, zoological garden, botanical garden, bird sanctuary, picnic hut, international conference centre, courts, sports training centre, reformatory, district battalion office, forensic science laboratory and all other activities which may cause nuisance and are noxious and obnoxious in nature.

#### 13.1.1.3. Transport and Communication Zone (T)

Activities in these zones are allowed in these sectors mainly:

- Roads
- Railway
- Airport
- Seaports/ Dockyard
- Bus depots/ truck terminals and freight complexes
- Transmission and Communication.

The activities that are allowed in this zone are: road transport terminals (bus terminals and depots), goods terminals, parking areas, circulations, airports-building and infrastructure, truck terminal, motor garage, workshop, repair and repair shop and facilities such as night shelter, boarding house, banks, restaurants, booking offices, transmission centre, wireless station, radio and television station, observatory and weather office.

The activities that are restricted in this zone are: any other use/activity incidental to transport and communication, motels, residential dwelling units for essential staff and watch and ward personnel.

The activities that are prohibited in this zone are: Any other use/activity incidental to transport and communication, residential dwelling units for essential staff and watch and ward personnel.

**13.1.1.4. Public and Semi-Public Zone (P)**

**Activities in these zones are allowed in these sectors mainly:**

- **Govt. / Semi Govt. / Public Offices**
- **Govt. land use**
- **Police Headquarter/ Station. Police line**
- **Educational and Research**
- **Medical and Health**
- **Socio Cultural and Religious (incl. Cremation and Burial Grounds).**
- **Utilities and Services.**

The activities that are allowed in this zone are: Government offices, central, state, local and semi government, public undertaking offices, defence court, universities and specialised educational institute, polytechnic, colleges, schools, nursery and kindergarten (not to be located near hospital or health care facility), research and development centres, social and welfare centres, libraries, social and cultural institutes, religious buildings/centres, conference halls, community halls, barat ghar, dharamshala, guest house, museum/art galleries, exhibition centres, auditoriums, open air theatre, recreational club, playground, banks, police station/police posts, police lines, police headquarters, jails, fire stations/fire posts, post and telegraph, public utilities and buildings, solid waste dumping grounds/sites, post offices, local state and central government offices and use for defence purposes, bus and railway passenger terminals, public utility and buildings, local municipal facilities, uses incidental to government offices and for their use, monuments, radio transmitter and wireless stations, telecommunication centre, telephone exchange, hospitals, health centres, nursing homes, dispensaries and clinic.

Activities that are restricted are: Residential flat and residential plot for group housing for staff employees, hostels, water supply installations, sewage disposal works, service stations, railway stations/yards, bus/truck terminals, burial grounds, cremation grounds and cemeteries/graveyards, warehouse/storage godowns, helipads, commercial uses/centres, other uses/ activities.

Activities that are prohibited are: Heavy, extensive and other obnoxious, hazardous industries, slaughter-houses, junk yards, wholesale mandis, dairy and poultry farms, farm-houses, workshop for servicing and repairs, processing and sale of farm product and uses not specifically permitted herein.

#### 13.1.1.5. Industrial Zone (I)

To create a conducive environment for development Industrial Zone is created. Total 1.22 sq.km of the industrial land use zone has demarcated in the proposed land use plan. The distribution of the main industrial zones is shown in the map. Activities allowed / not allowed will strictly depend upon the identified lists by the Ministry of Environment and Forests. All identified industries in the RED list are prohibited. The identified industries under the ORANGE are restricted and will be allowed only after environmental clearance and strict monitoring terms. Activities under the GREEN list are allowed. To refer the list, please go through Annexure.

In addition, small workshops and businesses can be allowed on the edge of the main industrial. However, existing land uses within the proposed industrial zone will allow as non-confirming use until redevelopment of such land parcels.

#### 13.1.1.6. Agriculture Zone (A)

This zone shall majorly be used for agriculture, the systematic and controlled use of other forms of life—particularly the rearing of livestock and production of crops—to produce food for humans. Activities allowed are: Dwelling for the people engaged in the farm (rural settlement), accessory structures, agriculture, horticulture and forestry, poultry, piggeries and dairy farm, cottage industries, storage, processing and sale of farm produce, petrol and other fuel filling stations, fishing, public utility and facility buildings.

Activities that are restricted are: Farm houses, extensive industry, brick kilns, sewage disposal works, electric power plant, quarrying of gravel, sand, clay or stone, service industries accessory to obnoxious and hazardous industries, school and library, temple, churches, mosques and other religious buildings, milk chilling stations and pasteurisation plants.

**Activities that are prohibited are: Residential use except those ancillary uses permitted in agricultural use zone, heavy extensive, noxious, obnoxious and hazardous industries, any activity which is creating nuisance and is obnoxious in nature.**

#### **13.1.1.7. Recreational Land Use (OR)**

**In order to ensure that the city is an attractive and desirable place to live, a high proportion of the developable area is proposed for open spaces and recreational activities. Social, economic and environmental benefits are the key factor to this land use. Activities that are allowed in this zone are: Regional parks, district parks, playgrounds, children traffic parks, botanical/zoological garden, bird sanctuary, clubs, stadiums (indoor), outdoor stadiums with/ without health centre for players and staff, picnic huts, holiday resorts, shooting range, sports training centres, specialized parks/maidans for multiuse, swimming pool, special recreation and special educational areas, library, public utilities, riverfront developments.**

**Activities that are restricted are: building and structures ancillary to use permitted in open spaces and parks such as stand for vehicles on hire, taxis and scooters, bus and railway passenger terminals, facilities such as police post, fire post, post and telegraph office, commercial use of transit nature like cinema, circus and other shows, public assembly halls, restaurants and caravan parks, sports stadium, open air cinemas.**

**Activities that are prohibited are: any building or structure which is not required for open air recreation, dwelling unit except for watch and ward personnel and uses not specifically permitted therein.**

#### **13.1.1.8. Waterbodies (W)**

**Waterbodies Zone indicates all existing waterbodies, i.e. rivers, streams, lakes, rivulets and wetlands, as indicated in the topographical sheets published by the Survey of India, the State Irrigation Department or Revenue Department or other competent authorities. The boundary of the waterbodies relate to the full tank level as indicated in relevant maps, covering both perennial and non-perennial parts when such distinction exists. Only transport networks, bridges, canals, reservoirs, or other water related infrastructures will be allowed in this zone. No reclamation will be allowed unless**

environmental clearance is taken. Depending upon the significance of the waterbody a buffer zone is marked which will fall under conservation zone.

#### **13.1.1.9. Forest (F)**

All reserve forests and forests as notified by the forest department are earmarked as Forest Zone in the proposed land use map. This is a highly restrictive zone where no development is allowed, unless expressly allowed by the concerned authority with the subject to the clearance from the Forest Department. 30 meter wide buffer shall be provided around the periphery of the forest area; where no development is allowed, except expressly allowed by the concerned authority.

#### **13.1.1.10. Conservation Zone (CA)**

In Kokrajhar this zone mainly includes the buffer zones around ecologically sensitive areas which include waterbodies, protected area, river basins, sensitive ecological corridors, ecologically important patches and areas crucial for landscape linkage. Also these are areas where conservation of buildings, artefacts, structures, areas and precincts of historic and /or aesthetic and/or architectural and /or cultural significance is required.

Activities that are allowed in this zone are: regional parks, district parks, playgrounds, children traffic parks, botanical/zoological garden, bird sanctuary, outdoor stadiums with/ without health centre for players and staff, picnic huts, shooting range, sports training centres, specialized parks/maidans for multiuse, swimming pool, special recreation and special educational areas, public utilities, riverfront developments.

Activities that are restricted are: building and structures ancillary to use permitted in open spaces and parks such as stand for vehicles on hire, taxis and scooters, bus and railway passenger terminals, facilities such as police post, fire post, post and telegraph office, commercial use of transit nature like cinema, circus and other shows, public assembly halls, restaurants and caravan parks, sports stadium, open air cinemas.

Activities that are prohibited are: any building or structure which is not required for open air recreation, dwelling unit except for watch and ward personnel and uses not specifically permitted therein. Flood plains are to be regarded as undevelopable use

zone and must be free of any permanent structure/ utility feature apart from transport networks.

#### **13.1.1.11.Mixed Land-use (M)**

Area will be available for commercial/institutional/ public/semi-public purposes, while the rest of the area will be for residential purpose. If for any reason, the percentage of area allotted for commercial development will not fully or partly developed for commercial activities then the area can be used for residential purpose; however, if the residential area is not fully developed then allotted residential area cannot be used for commercial purpose. The commercial/ institutional/ public/ semi-public activities must be non-polluting and nuisance free. Minimum 60% of the area built-up must be residential apart from the central business district. In case of central business district residential can be 20-30% minimum depending upon the proximity to the main central business lane/ lanes.

### **13.2. Zoning Regulations**

#### **13.2.1. Definition**

In order to attempt to organise and streamline the growth of urban areas it is necessary to have zoning regulations. This defines the use and coverage of buildings. This is a directive approach of conveying what uses are permitted or which are prohibited. It also includes general rules about location, bulk, height, and the plot shape, use and converges of structures within each zone.

In its most traditional form its purpose was to ensure a proper amount of land for all the activities that must be performed in a contemporary community. Early zoning ordinances meant designation of areas for residential, commercial and industrial uses for every community. Older zoning ordinances regulated the shape, volume and placement of building by height limitations, set back requirement (that buildings be set back from the street at a certain space) surroundings, buildings, and courtyards. They were applied to all buildings in the relevant zones. This form of zoning was criticised for its rigidity. The modern zoning methods use volume or floor areas ration based on the



















139	Watchmen or caretaker's lodges	■	■	■	■	■	■	■	■	■	■	■	■
140	Water Treatment Plant	■	■	■	■	■	■	■	■	■	■	■	■
141	Weekly Market/ Informal Sector Unit	■	■	■	■	■	■	■	■	■	■	■	■
142	Wholesale Trade	■	■	■	■	■	■	■	■	■	■	■	■
143	Wireless transmitting and weather station, Transmission Tower	■	■	■	■	■	■	■	■	■	■	■	■
144	Zoological park	■	■	■	■	■	■	■	■	■	■	■	■

*Source: Generated by Author*

**Note:** However in addition whenever activities that are restricted in Clause. 13.1 may be allowed only upon appeal to the concerned authority (Appeal Committee) to be constituted by authority.

### **13.2.2. Annexure:**

- **All Existing non nuisance, non-polluting uses to continue in the following use zones:**
  - Residential
  - Commercial
  - Industrial
  - Public/Semi-public
  - Transportation and Communication
  - Mixed-Use
- **All existing non nuisance, non-polluting uses may be allowed to continue/discontinue after an application for special permission to the Authority in the following use zones:**
  - Waterbodies
  - Recreational

- Forest
  - Public/ Semi Public
  - Conservation and
  - Agriculture.
- To be permitted in commercial areas to be indicated in Industrial Use Zones in Local Area Plans/ Layout Plans.
  - In Residential use zone, existing uses to continue and new ones to come on special permission from the authority only. No further expansion of residential area.
  - Only Existing uses to continue as non-confirming use if it is no threat to environment and society.
  - Parks, parking, circulation and utilities can be located in any of the use zones. In recreation, waterbodies and conservation zones, these would be permissible with special permission from the Authority.
  - Farm houses in agricultural zone will have maximum coverage of 25% and 50 FAR and 7m height.
  - Development of land would be permitted in Conservation zone, if an integrated land development proposal is submitted. Such proposal should cover an area of more than 20 ha and should have obtained prior Environmental Impact Assessment (EIA) clearance from competent authority with maximum coverage of 33% and maximum FAR of 150.
  - Maximum coverage of 25% and maximum FAR of 50 provided the area is not notified as water bodies, forest etc.
  - Motel is a roadside hotel designed primarily for motorists, typically having the rooms arranged in low blocks with parking directly outside with 30% coverage & 60 FAR. Motels may come up only around the State Highway, National Highway, Ring Road and CBD.
  - Existing villages will have maximum 30% coverage, 75 FAR and 9m height.
  - Appeal committee will decide the area which falls under villages.
  - In Conservation it is allowed on N.H by pass and peripheral ring road as a high way amenity.



- **Maximum coverage of 40% and maximum FAR of 100 on the plot along National Highway and peripheral ring roads be allowed.**
- **In case of integrated township development 33% coverage and 125 Far must be given. In case if the FAR is to be increased to 160 maximum, it can be done only after the consent of the appeal committee and by paying a premium fixed by the authority.**
- **An indicative list of restricted industries are:**
  - **Distillery including Fermentation industry**
  - **Sugar (excluding Khandsari)**
  - **Fertilizer**
  - **Pulp and Paper (Paper manufacturing with or without pulping)**
  - **Chlorine alkali**
  - **Pharmaceuticals (Basic) (excluding formulation)**
  - **Dyes and Dye-intermediates**
  - **Pesticides (Technical) (excluding formulation)**
  - **Oil refinery (Mineral oil or Petro refineries)**
  - **Tanneries**
  - **Petrochemicals (Manufacture of and not merely use of as raw material)**
  - **Cement**
  - **Thermal power plants**
  - **Iron and Steel (Involving processing from ore/scrap/Integrated steel plants)**
  - **Zinc smelter**
  - **Copper smelter**
  - **Aluminium smelter**
  - **Tyres and tubes (excluding Vulcanisation /Retreating/moulding)**
  - **Synthetic rubber**
  - **Glass and fiberglass production and processing**
  - **Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black etc.**
  - **Paints and varnishes (excluding blending/mixing)**
  - **Pigments and intermediates**
  - **Synthetic resins**

- Petroleum products involving storage, transfer or processing
- Lubricating oils, greases or petroleum-based products
- Synthetic fibres including rayon, tyre cord, and polyester filament yarn
- Surgical and medical products involving prophylactics and latex
- Synthetic detergent and soap
- Photographic films and chemicals
- Chemical, petrochemical and electrochemical including manufacture of acids such as Sulphuric Acid, Nitric Acid, Phosphoric Acid etc.
- Industrial or inorganic gases
- Chlorates, per chlorates and peroxides
- Glue and gelatine
- Yarn and textile processing involving scouring, bleaching, dyeing, printing or any effluent/emission generating process.
- Vegetable oils including solvent extracted oils, hydrogenated oils
- Industry or process involving metal treatment or processes such as pickling, surface coating, paint baking, paint stripping, heat treatment, phosphating or finishing etc.
- Industry or process involving electroplating operations
- Asbestos and asbestos-based industries
- Slaughter houses and meat processing units
- Fermentation industry including manufacture of yeast, beer etc.
- Steel and steel products including coke plants involving use of any of the equipment such as blast furnaces, open hearth Furnace, induction furnace or arc furnace etc. or any of the operations or processes such as heat treatment, acid pickling, rolling or galvanizing etc.
- Incineration plant
- Power generating plants (excluding DG Sets)
- Lime manufacturing
- Tobacco products including cigarettes and tobacco processing
- Dry coal processing/Mineral processing industries like ore sintering, palletization etc.
- Phosphate rock processing plants
- Coke making, coal liquefaction, coal tar distillation or fuel gas making
- Phosphate and detonators, fuses etc.

- 
- Explosive including detonators, etc.
  - Fire crackers
  - Processes involving chlorinated hydrocarbon
  - Chlorine, fluorine, bromine, iodine and their compounds
  - Hydrocyanic acid and its derivatives
  - Milk processing and dairy products (Integrated project)
  - Industry or process involving foundry operations
  - Potable alcohol (IMFL) by blending or distillation of alcohol
  - Anodizing
  - Ceramic/refractoriness
  - Lead processing and battery reconditioning & manufacturing including lead smelting.
  - Hot mix plants
  - Hospitals
  - Mining and ore-beneficiation
  - Miscellaneous.
- An indicative list of industries would be allowed only under strict supervision and environmental clearance are:
    - Manufacture of mirror from sheet glass and photo framing
    - 2. Cotton spinning and weaving.
    - Automobile servicing and repairs stations
    - Hotels and restaurants
    - Flour mills (excluding Domestic Aatta-Chakki)
    - Malted food
    - Food including fruits and vegetable processing
    - Pulping and fermenting of coffee beans
    - Instant tea/coffee, coffee processing
    - Non-alcoholic beverages (soft drinks)
    - Fragrances and industrial perfumes
    - Food additives, nutrients and flavours
    - Fish processing
    - Organic nutrients
    - Surgical and medical products not involving effluent/emission generating processes.

- Laboratory-wares
  - Wire drawing (cold process) and bailing straps
  - Stone Crushers
  - Laboratory chemicals involving distillation, purification process
  - Tyres and tubes vulcanisation, vulcanisation, retreating moulding
  - Pesticides/Insecticides/Fungicides/Herbicides/Agrochemical formulation
  - NPK Fertilizers/Granulation
  - Pharmaceuticals formulations
  - Khandsari sugar
  - Pulverizing units
  - Miscellaneous.
- An indicative list of industries which could be permitted in Industrial zone are:
    - Washing of used sand by hydraulic discharge.
    - Atta-chakkies.
    - Rice mullions.
    - Steeping and processing of grains.
    - Mineralised water.
    - Dal mills.
    - Bakery products, biscuits confectionery.
    - Groundnut decortivating (dry).
    - Supari (Betel nut) and masala grinding.
    - Chilling plants and cold storages.
    - Ice-cream or Ice-making.
    - Tailoring and garment making.
    - Cotton and woollen hosiery.
    - Apparel making
    - Handloom weaving
    - Shoelace manufacturing
    - Gold and silver thread zari work.
    - Gold and silver smithy.
    - Leather footwear and leather products excluding tanning and hide processing.
    - Musical instruments manufacturing.
    - Sports goods.

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- Bamboo and cane products (only dry operations)
  - Cardboard or corrugated box and paper products (Paper or pulp manufacturing excluded).
  - Insulation and other coated papers (Paper or pulp manufacturing excluded).
  - Scientific and mathematical instruments.
  - Furniture (wooden and steel).
  - Assembly of domestic electrical appliances.
  - Radio assembling.
  - Fountain pens.
  - Polythene, plastic and P.V.C. goods through extrusion moulding.
  - Rope (cotton and plastic).
  - Carpet weaving.
  - Assembly of air coolers, conditioners.
  - Assembly of bicycles, baby carriage and other small non-motorised vehicles.
  - Electronics equipment (Assembly).
  - Toys.
  - Water softening and demineralised plants.
  - Paint (by mixing process only).
  - Candles.
  - Carpentry (excluding saw mill).
  - Oil ginning/expelling (no hydrogenation/refining).
  - Jobbing and machining.
  - Manufacture of steel trunks and suitcases.
  - Paper pins and U-clips.
  - Block making for printing.
  - Optical frames.
  - Handlooms (without dyeing & bleaching).
  - Printing press.
  - Garments stitching, tailoring.
  - Thermometer making.
  - Footwear (rubber).
  - Plastic processed goods.

- Medical and surgical instruments
- Electronic and electrical goods.
- Rubber goods industry.
- An indicative list of industries which could be permitted in residential area
  - Cosmetic Products,
  - Agarbati.
  - Writing ink.
  - Sealing wax.
  - Watch repairing pen & spectacles repairing
  - Acrylic sheet Butten.
  - Plastic Covers (Dairy and Files etc.)
  - Knitted Plastic Bags.
  - Shoe repairing and manufacturing.
  - Rubber Stamps.
  - Rubber Moulded Goods.
  - Food Products- Bakeries etc.
  - Creamery and Dairy Products.
  - Ata Chakki and Masala Grinding.
  - Repacking of Medicines etc.
  - Paper Products.
  - Card Board Boxes.
  - Book Binding.
  - Printing press with aggregate motive power not exceeding 5 H.P. and not employing more than 5 persons.
  - Ready-made Garments.
  - Batik Printing.
  - Embroider.
  - Watch straps (Nylon).
  - Canvas Bags and Products.
  - Hosiery Items.
  - Surgical Bandages.
  - Shoe Laces etc.
  - Thread Reels.
  - Tailors Label.

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- **Mirror and Frame Making.**
  - **Decorative Class Articles.**
  - **Chalk Sticks.**
  - **Tailors Soap.**
  - **Cycle Repairing Soap.**
  - **Basket making.**
  - **Wire Brushes.**
  - **Umbrella Assembly.**
  - **Wooden Toys.**
  - **Papers pins, gem clips**
  - **Hair pins.**
  - **Wire Staples.**
  - **Wire Stands for Kitchens.**
  - **Wire loops.**
  - **Wire for Curtains.**
  - **Decorative key Rings.**
  - **Link Clips.**
  - **File Clips.**
  - **Shoe & Tent eyelets.**
  - **Brass Jewellery.**
  - **File covers Accessories.**
  - **Garment Hooks and eyes.**
  - **Link Chain.**
  - **Heating Element (for domestic electrical appliance).**
  - **Decoration lighting series.**
  - **Transistor Radio Covers.**
  - **Manufacture of Bidi.**
  - **Decorative Leather hand gloves.**
  - **Processing of beetle nut (suparis).**
  - **Laundry dry cleaning and dyeing.**
  - **Cotton cloth weaving in Hand Looms.**
  - **Ivory carving.**
  - **Metal polishing.**
  - **Gold and Silver thread, Jari work, Jewellery, Gold ornaments.**

- **Manufacture, repairing and tuning of musical instruments.**
- **Making of lock Bangles.**
- **Repairing of Electronic Instruments.**

**Note:** For interpretation of land use zoning and development control regulation Authority may constitute a committee of experts if such situation arises. The committee may also be given the task of elaborate and add on the above land use permissibility considering the circumstances that may come from time to time in the process of implementation of the plan for subsequent approval of Government.

### **13.3. Development controls**

**These regulations/controls allow freedom to adopt appropriate practices in lines with the approach to the human settlement, both urban and regional. These can be:**

- **Development plans for its zonal planning and building design,**
- **Fire safety provisions,**
- **Environmental and geographical variation,**
- **Protection and improvement of local environment,**
- **Socio-economic considerations,**
- **Towards the creation of sustainable human settlements.**

**Technological and socio-economic developments in recent times have led to remarkable increase in demand for more and more sophistication in buildings resulting in ever increasing complexities. These perforce demand high levels of inputs from professionals of different disciplines such as architecture, civil engineering, structural engineering, functional and life safety services including special aspects relating to utilities, landscaping, etc. in conceptualization, spatial planning, design and construction of buildings of various material and technology streams, with due regard to various services including operation, maintenance, repairs and rehabilitation aspects throughout the service life of the building.**



Apart from the given general regulations, energy efficiency in the building bye-laws to be adopted as per Energy Conservation Building Code (ECBC) was launched by Ministry of Power in May 2007. It sets minimum performance standards for buildings to promote energy efficiency.

#### **13.4. Building Bye-Laws**

At present the Assam uniform building bye-laws for notified areas other than Guwahati, 2014 is to be considered as the building bye-law for Kokrajhar Master Plan area. Government of Assam has taken up step to modify these rules in line with Model Building Bye Laws, 2016 of Town and Country Planning Department of India.

Any existing development since the notification of the Master Plan of Kokrajhar, 2011 and any upcoming development must lawfully follow the uniform Building Bye Laws of Assam and must continue to do so unless the TCPO releases a notified revised version of the Model Building Bye-Laws.

Building Bye-Laws are legal tools used to regulate coverage, height, building bulk, and architectural design and construction aspects of buildings so as to achieve orderly development of an area. They are mandatory in nature and serve to protect buildings against fire, earthquake, noise, structural failures and other hazards. In India, there are still many small and medium sized towns which do not have building bye-laws and in the absence of any regulatory mechanism, such towns are confronted with excessive coverage, encroachment and haphazard development resulting in chaotic conditions, inconvenience for the users, and disregard for building aesthetics, etc.

It is in this context, TCPO has made an effort to prepare “Model Building Bye-Laws-2016” for the guidance of the State Governments, Urban Local Bodies, Urban Development Authorities, etc. which is an improvement over the previous Model Building Bye Laws brought out in 2004. In 2003, the Ministry of Urban Development desired that Model Building Bye-Laws be prepared, in view of Bhuj Earthquake that occurred in 2001, to lay focus on structural safety of buildings and for the guidance of the State Governments. Accordingly, the MBBL 2004 incorporated the provisions of structural safety and other provisions like rainwater harvesting and waste water recycling, solar assisted heating, barrier free public buildings and fire safety. The Bye-

Laws were circulated to all the State Governments and Union territories and out of 36 States and UTs, wherein 22 States and UTs have undertaken comprehensive revision of their respective Building Bye-Laws since 2004.

The reasons for revising the Bye-Laws are as under:

- Growing Environmental concerns
- Increased Safety and Security measures
- Technological Developments
- Swachh Bharat Mission
- Focus on Ease of Doing Business.

In 2015, it was further desired by the Ministry of Urban Development that the Model Building Bye-Laws, 2004 needs to be revised and updated keeping in view the emerging issues like Norms for Rooftop Solar PV Installation, Segregated sanitation facilities for visitors in public buildings, Additional provisions in Building regulations for natural hazard prone areas, Conservation of heritage sites including heritage buildings, heritage precincts and natural feature areas, Bye-laws for safe use of glass, barrier free environment for disabled, children and old persons and Mitigation of the effects of electromagnetic radiation on built spaces.

#### 14. MASTER PLAN IMPLEMENTATION

Keeping in mind the vision for The Revised Master Plan of Kokrajhar, 2040 proposals were made. The broad proposals are as follows:

- **Transport:** Two new Ring Roads/Major District Roads and Three new By-pass Roads have been proposed. Existing roads will be planned according to standards and facilitation of parking and footpaths has been proposed.
- **Physical infrastructure:** A Water Treatment Plant of 0.19 Ha area, a Sewerage Treatment Plant of 0.2-0.3 Ha area, a Land Fill site of 0.28 Ha area, a Bus Terminal and many other capacity improvements has been proposed as per shortages.
- **Social Infrastructure:** Proposals of various social infrastructures has been made at town level and community level viz. hospitals over 11.7 Ha area, educational hub of 107 Ha area, exhibition cum fair ground of 412 Ha area, district playground of 25 Ha area, community playgrounds, Community halls, commercial centres, etc. to improve the quality of life of the people.
- **Socio-economic:** Improvement of functional linkages of the town and introducing vocational skill development and training centres for employment generation.
- **Housing:** Housing area for an additional 11, 516 units have been proposed.
- **Environment:** Conservation zones were marked around the natural features which needs to be protected i.e. waterbodies and forests.
- **Land-use:** The various changes in Land-use proposed are:
  - Industrial area next to forest has been relocated next to the State Highway 31C keeping the protection of forest and better connectivity.
  - Two Ring roads/Major District roads have been proposed around the Master Plan to help the city grow in planned direction and better connectivity.
  - By-pass roads has been proposed to connect these Ring Roads especially around major land marks and administration head i.e. BTC.
  - Recreational area has been proposed in and around the city both for the purpose of recreation and environmental protection.
  - Public and Semi Public areas are proposed to hold the growing infrastructural needs.

- Looking into the typical existing urban fabric Mixed Use category has been introduced specifically around the core of the city.
- Commercial Land-use is increased around the city to looking into the socio-economic status of the city.
- Eco-sensitive zone/Conservation Zone has been introduced around natural features to check encroachment and further degradation due to urbanisation.
- Infrastructural proposal locations in terms of Water Treatment Plant (WTP), one Sewerage Treatment Plant (STP) and a Bus Terminal (BT) have been proposed.

Considering the institutional and financial constrains the proposals has been divided into phases in resonance with the administrative/ municipal tenure.

Development of a sequence of steps that move the organizations, infrastructure, equipment, systems and facilities from their current to the desired set one is termed as phasing. These are sequenced and timed such that operational requirements are met with minimum disruption and expense. Based upon the proposals' scope and its state of urgency and feasibility, they are phased out. Also proposals that provide immediate return with minimal investments and resource utilisation are identified and phased accordingly in the initial phases.

The development of the proposals for this master plan is divided into four phases, each to be developed and reviewed as five year plans;

- Phase I: From the day of the notification of the master plan to a period of five years (0-5 years)
- Phase II: Right after first five year of Phase I ends to a period of five years (6-10 years)
- Phase III: Subsequent five years to Phase II (11-15 years)
- Phase IV: From the day Phase III completes its five year to 2040. (16 year – 2040)

Apart from Phase IV all phases are to be strictly developed as five year plan. The final phase would be longer as it is more difficult to project actual conditions further into the

future. With this in mind, the phasing plan should be reviewed annually as a part of the town's budgeting process to review goals and any significant changes to funding availability. In addition a more thorough review of the master plan should occur at least once every five years to ensure that goals are being achieved and that the master plan remains consistent with future unforeseen trends and community needs.

Land-use plan, land use zoning, sub-division and development control regulations would in general be the base for all development, and redevelopment in the city.

#### **14.1. Phase I**

##### **14.1.1. Formulation of implementation committee in each department**

As soon as the Master Plan is notified each department must act upon the proposals to initiate. In order to implement all departments and the development authorities are to form responsible boards/ committee/ team for the streamline of development projects and implementation of acts/regulations. TCPO shall be the nodal agency for the Master Plan.

##### **14.1.2. Detailed Planning and designing**

For each development project/facilities that has been proposed, complete site specific strategic development plans must be prepared by each defined authority.

##### **14.1.3. Land Acquisition:**

For strategic growth it is foremost necessary for the initiation of the land acquisition process to start at the earliest to avoid any time lags for the development process to start. As it is evident in most Indian urban scenario that immense amount of litigations arise during the process.

##### **14.1.4. Preparation of DPRs/TEFRs**

All the responsible departments are advised to prepare the DPR (Detailed Project Report) and TEFR (Techno Economic Feasibility Report) of the development projects

to have a complete document for investment decision-making, approval, planning whereas feasibility study report is a base document for investment decision-making. By doing this the explanation of the following will be achieved:

- list of policies that could be associated,
- requires sources for the development of the project,
- sources of funding,
- capital cost,
- profitability analysis,
- project description and layout plans,
- technical parameters,
- description of technology to be used,
- evaluation of existing resources,
- generation of a schedule plan,
- volume of work,
- time and money framework, etc.

#### 14.1.5. Sector wise development

Each sector of the Plan will have its own flow of work according to its need of urgency in the urban context. The various phase developments for different sectors are as follows:

##### *1.1.4.1. Transport*

The various developments in Phase I areas follows;

- The inner ring road around the municipal boundary is proposed to be developed in Phase I to bypass the thorough fare.
- Riverfront road to be developed so as to reduce the congestion off the roads of the core business district of the town.
- As soon as the technical studies are done the steps associated with the construction of the second bridge must start.

#### *1.1.4.2. Physical Infrastructure*

##### **Water Supply**

- Laying down of water supply pipes shall be integrated with the development of respective roads in Phase I, II and III so that the roads are not dug out once they are constructed.

##### **Sewerage**

- Laying down of sewer pipes shall be integrated with the development of respective roads in Phase I, II and III so that the roads are not dug out once they are constructed.
- As soon as the technical studies are done the steps associated with the construction of the STP, its construction must start.

##### **Solid Waste**

- Relocation of the existing Landfill site.
- Development of scientific land fill site must start in this phase
- To provide further necessary infrastructure such as dustbins, dumpers, trolleys, trucks, etc. required for collection, storage, segregation and transportation of solid waste must be bought.
- Segregation of solid waste and 100 collection of solid waste from all the wards must start immediately.

##### **Drainage**

- Desilting, cementing, treatment, clearance of and form of blockage must be done in this phase.
- Watershed channels must be made free of any kind of blockage or encroachments.

#### *1.1.4.3. Social Infrastructure*

- Community facilities are to be developed as neighbourhood facilities around neighbourhood centres and are generally the facilities, park and shopping areas

to cater to the needs of 15000 populations. These also include some new residential areas to be developed as integral part of the same.

- The location of the community facilities must come along with the residential development in any particular area in close proximity.
- Primary school shortages are to be met in this phase.
- Intermediate hospital of 100 beds are to be built in phase I, rest 100 beds to be covered in phase II
- Primary health facility shortage to be met in this phase.

#### *1.1.4.4. Socio-economic*

With the declaration of the mixed use zones and the CBD, the urban renewal of the Central Business District will start in this phase.

#### *1.1.4.5. Housing*

Housing shortages are to be met organically around the prescribed land-uses strictly following the zoning regulations and the development controls

#### *1.1.4.6. Environment*

Pollution control board to be set up as soon as possible. Locations of monitoring centers are to be developed subsequently in different phases as per need and technical surveys.

#### *1.1.4.7. Disaster Management*

Flood plains are to be made free of any form of encroachments.

## **14.2. Phase II.**

### **14.2.1. Sector wise development**

Each sector of the Plan will have its own flow of work according to its need of urgency in the urban context. The various phase developments for different sectors are as follows:



#### *14.2.1.1. Transport*

The various developments in Phase II areas follow;

- The renewal of existing urban roads shall be done in this phase which would include the development of street infrastructure, road widening, etc.

#### *14.2.1.2. Physical Infrastructure*

##### **Water Supply**

- Development of Water Treatment Plant.

##### **Sewerage**

- Development of Sewerage Treatment Plant.

##### **Solid Waste**

- Development of buffer zones.

##### **Drainage**

- Construction of new drains.

#### *14.2.1.3. Social Infrastructure*

- Development of layout plans for colleges/ institutes as per need to develop Kokrajhar as an educational hub.
- Development of facilities as per community need.

#### *14.2.1.4. Socio-economic*

Urban renewal phase must continue until the area is developed as a Central Business District.

#### *14.2.1.5. Housing*

Layout plans for housing must be prepared for new residential areas and proper percentages for EWS and LIG must be reserved in the plan.

#### *14.2.1.1. Environment*

All ecologically significant natural features are to be demarcated, protected and conserved.

#### *14.2.1.2. Disaster Management*

Layout plans for Flood plains which are now declared as conservation zone must be prepared

### **14.3. Phase III**

#### **14.3.1. Sector wise development**

Each sector of the Plan will have its own flow of work according to its need of urgency in the urban context. The various phase developments for different sectors are as follows:

#### *14.3.1.1. Transport*

The various developments in Phase III areas follow;

- TEFR of the outer ring road. Outer ring road shall be developed only after the monetary analysis and reviewing of the Inner ring road.

#### *14.3.1.2. Physical Infrastructure*

#### **Water Supply**

- Evaluating the need of the projected population, development plan to be made.
- Development of another Water Treatment Plant if necessary.

**Sewerage**

- **Development of Sewerage Treatment Plant.**

**Solid Waste**

- **Development of solid waste treatment system/technology as per CPHEEO manual.**

**Drainage**

- **Construction of new drains.**

*14.3.1.3. Social Infrastructure*

- **Construction of Colleges as per need.**
- **Preparation of layout plans for Intermediate Hospital with 100 beds and Multi-speciality Hospital.**

*14.3.1.4. Socio-economic***Development of CBD***14.3.1.5. Housing*

**Redevelopment of housing conditions around the municipal area and strict initiatives to make it slum free must be taken.**

*14.3.1.6. Environment*

**Locations of monitoring centers are to be developed as per need and technical surveys.**

*14.3.1.7. Disaster Management*

**Implementation of conservation plans especially the plantation phase must be complete.**

## **14.4. Phase IV**

### **14.4.1. Sector wise development**

Each sector of the Plan will have its own flow of work according to its need of urgency in the urban context. The various phase developments for different sectors are as follows:

#### *14.4.1.1. Transport*

The various developments in Phase III areas follow;

- Construction of outer ring road if necessary.
- Development of new internal roads as per need along the different zones.
- To evaluate the development of the past three phases and fill in if development perspective in tagging behind.

#### *14.4.1.2. Physical Infrastructure*

##### **Water Supply**

- Complete coverage of the Master Plan area for water supply with active water supply network.

##### **Sewerage**

- Complete development of sewerage network covering the whole Master Plan area.

##### **Solid Waste**

- Development of buffer zones.

##### **Drainage**

- Construction of new drains.

*14.4.1.3. Social Infrastructure*

- Intermediate Hospital with 100 beds.
- Construction of Multi-speciality Hospital.
- Utility facilities for the upcoming population

*14.4.1.4. Housing*

**Construction of new housing sectors as per plan.**

*14.4.1.5. Environment*

**Active Monitoring Centres must be constructed especially around the industrial zones and hospitals.**

*14.4.1.6. Disaster Management*

**Complete implementation of the conservation plans.**

**Note: If required because of the change in any governmental policy in the due phase, modifications to the sequence of phasing might take place accordingly and so will be the Land-use.**