পঞ্জীভুক্ত নম্বৰ - ৭৬৮ /৯৭ Registered No.-768/97

অসম ৰাজপত্ৰ

সত্যমেব জয়তে

THE ASSAM GAZETTE

অসাধাৰণ

EXTRAORDINARY

প্ৰাপ্ত কৰ্ত্তৃত্বৰ দ্বাৰা প্ৰকাশিত

PUBLISHED BY THE AUTHORITY

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No. 376 Dispur, Tuesday, 24th May, 2022, 3rd Jaistha, 1944 (S. E.)

GOVERNMENT OF ASSAM

ORDERS BY THE GOVERNOR

DEPARTMENT OF HOUSING & URBAN AFFAIRS

NOTIFICATION

The 29th March, 2022

No. UDD(T)151/2022/6 – In exercise of the powers conferred by the Section 9 and Sub-Section (1) of Section 10 of the Assam Town & Country Planning Act, 1959 (as amended) and (Assam Act II of 1960) read with sub-rule (1) of Rules 3 of the Assam Town & Country Planning (Publication of Master Plan and Zoning Regulations) Rules 1962, the Governor of Assam is pleased to publish the following notice regarding the publication of the Draft Revised Master Plan for Nalbari.

Notice for publication of the Draft Revised Master Plan for Nalbari

1. It is notified that the Draft Revised Master Plan for Nalbari prepared under Section 9 of the Assam Town & Country Planning Act, 1959 (as amended) as described in the schedule below is hereby published.

2. Any person or persons affected by the Draft Revised Master Plan may submit their objections or opinions in writing to the Director of Town & Country Planning within two months from the date of publication.

3. The Draft Revised Master Plan with all relevant papers and maps may be inspected free of cost during the office hours at the office of Director, Town & Country Planning, Dispur, Guwahati-6, Deputy Director, Town & Country Planning, Dist Office – Nalbari, Office of the Deputy Commissioner, Nalbari, Office of the Chairman, Nalbari Development Authority, Office of the Chairman, Nalbari Municipal Board & Nalbari Ghagrapar, Samata and Banbhag Circle Office. Copy of the Draft Master Plan is available in the Office of the Deputy Director, Town & Country Planning, Dist Office – Nalbari for sale on payment.

SCHEDULE

4 . LOCATION AND AREA

DISTRICT	:	NALBARI
SUB-DIVISION	:	NALBARI
POLICE STATION	:	NALBARI
STATE	:	ASSAM
APPROXIMATE MASTER PLAN AREA	:	121.37 Sq. Km.
APPROXIMATE MUNICIPAL AREA	:	13.54 Sq. Km.

5. REVENUE AREA INCLUDED IN THE REVISED NALBARI MASTER PLAN- 2041

1. Nalbari Municipal Area
2. Other Revenue Area

Mouza		***Villages***
Bahjani	:	(1) Amayapur (2) Alengidal (3) Arara (4) Bar Agra (5) Bhodra (6) Dakshin Bezra (7) Janigog (8) Modan Mohan Sokoa (9) Mugkuchi (10) Nandagaon (11) Tilana
Batagila	:	(12) Barsarkuchi (13) Bhuyarkuchi (14) Dhekhiabari (15) Goremara (16) Haripur (17) KatlaBarkuchi (18) KhudrakatlaBorkuchi (19) Moiradonga (20) Namati (21) Sariahtoli (22) Batahgila (23) Pitanipara (24) Balikuria (25) Bardhantoli (26) Barkura
Dharmapur	:	(27) Boushiapara
Khata	:	(28) Balakuchi (29) Balilecha (30) Bhutakhatara (31) Borchenikuchi (32) Borkhanajan (33) Digheli (34) Jajiabari (35) Japarkuchi (36) Joy Mongla (37) Kendukuchi (38) Khatahkuchi (39) Khatkatra (40) Khudra Chenikuchi (41) Khudrapipolia (42) Khudrasankara (43) Kordaitola (44) Majdia (45) NalbariGaon (46) Paikarkuchi (47) Poila (48) Porakuchi (49) Sahpur (50) Sandha (51) SandhaKairara (52) Tantrasankara (53) Terechia (54) Balikuria Kharjara
Natun Dehar	:	(55) Borkhetria Banekuchi (56) Kashimpur (57) Niz Banekuchi
Pokowa	:	(58) Panigaon (59) Pokowa (60) Sandheli
Pub Banbhag	:	(61) Baghmara (62) Bilpar (63) Dolua (64) Gatiyan (65) Guakuchi (66) Katuriya (67) Koiyakuchi (68) Katakiya (69) Majarbari (70) Paisara

6. DESCRIPTION OF BOUNDARIES

North	:	Baksa District
South	:	Kamrup District
East	:	Kamrup District
West	:	Barpeta District

RAJESH PRASAD,
Principal Secretary to the Government of Assam,
Department of Housing & Urban Affairs
Dispur, Guwahati-6.

1. INTRODUCTION TO MASTER PLAN AREA

1.1 INTRODUCTION AND SALIENT FEATURE OF THE TOWN

Nalbari, a trade and commerce-cum-service town, located on the northern part the then un-divided Kamrup district in the state of Assam, came into as an urban centre with the setting up of its first Town Committee in March, 1938 and was raised to the status of the Municipality in 1953. Since its initial days, the town has grown very organically. As an urban centre, the pattern of development was linear along the N.T. Road.

Nalbari has been declared as a sub divisional Head Quarter since 1st of August 1967. The Nalbari Sub-divisional had been raised to the status of a District on 14th August, 1985 with its Head Quarter at Nalbari Town. As per Census 2011, Nalbari District have 456 no. of Villages, 65 no. of Gaon Panchayat, 7 no. of Community Development Block, 7 no of Anchalik Panchayat and 1 no. of zila parishad.

1.1.1 *Location*

The town is located at about 71 kms. west of Guwahati, the largest Class I City of the entire North-East Region, along the N.H. 31. Barpeta, the Head Quarter town of the Barpeta District, lies at a distance of about 70 kms. west of Nalbari. Its cardinal points are 26.445°N 91.440°E. The altitude of the town is about 53 meters.

1.1.2 *Regional settings*

Nalbari is well connected by roads as well as by railways. The N.H. 31 passing through Nalbari connects it with Guwahati and other important urban and rural centre of the District as well as of the state. Nalbari also serves as an important railway station of N.F. Railway. The Broad-Gauge routes of N.F. Railway passes through Nalbari connecting the town with Guwahati and other parts of the State as well as the rest of the country.

1.1.3 *Brief history of the town*

The original un-divided Kamrup District being primarily an agricultural district, Nalbari has developed as an agro-based commercial town. The town has its importance as an administrative centre also. In 2011 Census it has been classified as a Class III town. The Nalbari Municipal area coverage was approximately 3.95 sq.kms. with a population of 23,183 in 2001 which has increased to about 27,839 in 2011. According to the Census 2011, Nalbari district has the highest Decennial growth rate of urban population of 200.99 percent recorded.

1.2 PHYSICAL ENVIRONMENTAL CONDITION

The entire area of the District is situated at the plains of the Brahmaputra Valley. The tributaries of the Brahmaputra, Nona, Buradia, Pagaldia, Borolia and Tihu which have originated from the foothills of the Himalayan Range, are wild in nature and have enormous contribution towards the agrarian economy of the district.

1.2.1 *Climate & Rainfall*

The District has a sub-tropical climate with semi – dry hot summer and cold winter. Summers are hot and humid; with an average temperature of 29 °C. During summer, generally during the months from May to August, heavy rainfall occurs for which the district experiences flood. The District experiences annual (average) rainfall and humidity @ 1500 mm and @ 80 % respectively. Winters extend from the month of October to February, and are cold and generally dry, with an average temperature of 16°C.

1.2.2 *Physiography*

Nalbari town occupies its position on flat alluvial plain land. River Pagaldia, a north bank tributary of the river Brahmaputra, passes through the eastern side of the town. During the monsoon, the town and the surrounding rural areas are heavily affected by floods, causing havoc to population and crops of the area. The general gradient is towards the river Brahmaputra in the south. The area on the bank of the river has very low elevation and is inundated during flood.

1.2.3 *Soil Condition*

The Soil condition of the Town is a heterogeneous one. The Soil of the northern part of the Town is clayey and loamy whereas the middle part is loamy and sandy. The Soil of the southern part of the district is composed of sandy soil.

1.3 HISTORICAL BACKGROUND

1.3.1 *History and Culture*

'Nalbari' means a place of reeds. The name was founded by the British Railway Engineers around in A.D. 1890-91. The former name of this place was Satra, Govindapur and Khata. The history of Nalbari is connected with King Jarashandha and Lord Krishna. Nalbari is also known as 'Navadivipa' of Assam. The place is well known for its rustic charm and ancient temples making it enthralling for tourists especially during religious festivals.

The name of a place is generally associated either with some historical facts or with some legends. The origin of the name “NALBARI” is based on different legends, one of which says that there was high density of population in the place and hence the name “NARABARI” came which was later termed as “NALBARI”.

Nalbari is a meeting ground of three cults of Sanatan Hindu Religion namely Vaisnabe, Shakta and Shiva. Large number of Satras and Temples related to the above cults are in existence in the town and the neighbouring areas. Records of some of these Satras and Temples speak about the contribution of Ahom Kings in spreading Hindu Religion in the area. Nalbari continues to be the centre for art and culture from the time immemorial.

1.4 MASTER PLAN : DEFINITION & FORMULATION

Most of the urban settlements, especially smaller urban settlements, are characterized by haphazard and unplanned growth, non-conforming land uses, mushrooming unauthorized colonies, and land conversion from agriculture to urban resulting in environmental degradation and poor quality of life.

Master Plan/Development Plan is the major tool for urban land management, providing detailed land-use allocation for the sustainable development of city/town. Most master/development plans are made for 20-25 year periods, in phases of five years for periodic review and revision. A master plan is prepared either for improvement of an old city or for a new town to be developed on a virgin soil.

The purpose of the master plan is to set down as clearly and practically as possible the best and most appropriate future development of the town. For physical planning to be successful, it must develop a consensus on sound principles while balancing the visionary with the realistic. Formulation of master plans start with base map preparation, existing land use surveys and collection of socio-economic data necessary for reviewing the existing situation and proposing the future land use plan. With the advances in remote sensing and geographic information system, the plan making process can be expedited with integration of both spatial and attribute data, which enables detailed assessment of spatial growth of towns/cities, land use status, physical infrastructure facilities, etc. in anticipation of the projected population growth.

1.5 NEED OF THE MASTER PLAN

A master plan is a blueprint for the future. It will help the society as

- To control the development of various industries in a systematic way.
- Define public, semiprivate, and private spaces and public amenities
- To discourage the growth of town in an unplanned and unscientific way.
- To give a perspective picture of a fully developed town.
- To limit to a certain extent the unprecedented flow of rural population to the urban area.
- To offset the evils which have come up due to over-crowding of population such as acute shortage of houses, traffic congestion, inadequate open spaces and insufficiency in public amenities; etc.

1.6 PROJECT OBJECTIVE & ITS VISION

The broad objective of this project is to prepare a Master Plan Report for Nalbari Town 2041. Report is the final output of the research.

Vision being a cherished dream, to achieve this vision it is necessary to break it into a number of goals and subsequently to objectives.

- Identifying existing gaps in physical and social infrastructure & to bridge those gaps
- By proper policy planning and strict adherence of the land use zoning and building byelaws.
- By submerging the planning with combing funds from the state as well as the centrally sponsored schemes
- Ensuring systematic, balanced & integrated development.

1.7 SCOPE OF WORK

The proposed study will cover areas of Nalbari MP Area as defined and notified under the Act. The scope of work for revision of Nalbari Master Plan will cover the following.

- To identify the gaps/ incongruities between the actual land use and existing Master Plan proposals
- To identify the systematic and methodological deficiencies in implementation and preparation of Master Plan
- To prepare the Revised Draft Master Plan for Nalbari MP Area

2. PROFILE OF THE MASTER PLAN AREA

2.1 INTRODUCTION

Nalbari town is the headquarters of Nalbari District. The Town MB area is about 13.54 sq. km of total area. As per the Census of 2011, there are 12 wards within the Municipal Board area. However, in 2020 the wards in Nalbari town have been extended to 17.

The north and west side of the district is bounded by Baksa and Barpeta districts respectively. The southern and eastern side of the district is bounded by Kamrup district. The entire area of the District is situated at the plains of the Brahmaputra Valley.

Figure 2-1: Location Map of NalbariDistrict

2.1.1 *Demographic Profile*

2.1.1.1 Area and Population

Nalbari Municipal Board has a population of 27,839 of which 14,425 are males and 13,414 are females as per report released by Census India 2011. The total population of Nalbari Town constitutes about 3.60% of the total district population. The total master plan area population is 140667 (Table 2-1).

Table 2-1: Growth of Population in Nalbari (1941 - 2011)

YEAR	NALBARI MUNICIPAL AREA		NALBARI MASTER PLAN AREA (Excluding the Municipal area)		TOTAL MASTER PLAN AREA	
	Population	% Variation	Population	% Variation	Population	% Variation
1941	3578	---	---	---	---	---
1951	4422	23.59	---	---	---	---
1961	9285	109.97	7584	---	16869	---
1971	12548	35.14	9958	31.30	22506	33.42
1991	18949	51.01	23430	135.29	42379	88.30
2001	23183	22.34	40517	72.93	63700	50.31
2011	27839	20.08	112828	178.47	140667	120.83

*Source: Compiled from Census of India.*provisional census*
**1981 Census was not held in Assam.*

In the earlier master plan, total villages included were 21 nos. + Nalbari Municipal area, whereas in the revised master plan for 2041, the no. of villages goes upto 70 nos. + Nalbari Municipal area, resulting in bigger area compared to the old Master Plan 2000.

Table 2-2: Population and Area Distribution, NalbariMunicipality Area- 2011

Category	Master Plan Area	Municipality Area
Area (HA)	12137	1250
Total Population	140667	27839
Number of Wards	-	12
Density (ppha)	11.59	22.27

Source: Compiled from census of India, 2011 and Nalbari Municipal Board

2.1.1.2 Population Distribution and Growth Trends

As per Census 2011, the total numbers of wards in the town are 12. In terms of population distribution amongst the wards, population share is higher in Ward 4 i.e.3811 and lowest in ward 6 i.e. 696. Table 2-3 presents the ward wise total population in 2011.

Table 2-3: Ward Wise Population, Nalbari Town, 2011

Ward No	Name of Ward	No of HHs	Population
1	Ward 1	317	1483
2	Ward 2	827	3752
3	Ward 3	398	1806
4	Ward 4	850	3811

5	Ward 5	392	2100
6	Ward 6	125	696
7	Ward 7	608	2666
8	Ward 8	277	1351
9	Ward 9	595	2776
10	Ward 10	580	2584
11	Ward 11	771	3321
12	Ward 12	347	1493
Total		**6087**	**27839**

Source: District Census Handbook, Census of India, 2011

The population distribution of the 70 villages in the revised master plan area as per the Census, 2011 is as follows-

Table 2-4: Nalbari Master Plan Area (Excluding Nalbari Municipality Area), 2011

Sl_No	Village	No. of Households	No. of Population
1	Amayapur	272	1463
2	Arara	571	2823
3	Baghmara	508	2204
4	Balikoria Part-1	1421	6359
5	Balikuria Kharjara	758	3361
6	Balilecha	374	1773
7	Bardhantoli	145	742
8	Barkura Part-1	791	3516
9	Barsarkuchi	488	2330
10	Batahgila	23	103
11	Bhodra	98	510
12	Bhutakatara	26	137
13	Bhuyanarkuchi	234	999
14	Bilpar Gaon	246	1214
15	Bolakuchi	94	493
16	Borchenikuchi	82	434
17	Borkhanajan	109	552
18	Borkhetri Banekuchi	342	1595
19	Boushiapara	193	920
20	Dakshin Bezra	148	745
21	Dhekiabari	44	191
22	Digheli Part-1	1114	5285
23	Dolua	202	1022
24	Elengidal	407	1901
25	Gatiyan	29	122
26	Goremara	111	484

27	Guakuchi	135	614
28	Haripur	369	1796
29	Jajiabari	158	826
30	Janigog	747	3795
31	Japarkuchi	1003	4626
32	Joymongla	386	1956
33	Joymongla bar agra	257	1341
34	Kashimpur Part-1	974	4996
35	Katahkuchi	63	302
36	Katuriya Gaon	152	791
37	Kendukuchi	164	720
38	Khatkatra	142	699
39	Khudra Chenikuchi	173	873
40	Khudrakotola Borkuchi	455	2159
41	Khudrapipolia	68	343
42	Khudrasankara	72	365
43	Koiyakuchi	307	1683
44	Kordaitola	277	1419
45	Kotlabarkuchi	316	1538
46	Kotokia Gaon	157	726
47	Major Bari Gaon	130	604
48	Mazdia	446	2049
49	Modanmohan Sokoa	150	683
50	Moiradonga	115	564
51	Mugkuchi	518	2423
52	Nalbari Gaon	579	2369
53	Namati Part-1	736	3807
54	Nandagaon	107	483
55	Nij Banekuchi	65	360
56	Paikarkuchi	224	1077
57	Panigaon Part-1	729	3427
58	Pitanipara	103	479
59	Poila	447	2104
60	Poisara	357	1767
61	Pokoa Part-1	642	3086
62	Porakuchi	216	1150
63	Sahpur	279	1351
64	Sandha Part-1	723	3428
65	Sandhakairara	140	690
66	Sandheli	220	1086
67	Sariahtoli Part-1	756	3830
68	Tantrasankara	150	749
69	Teresia	189	960
70	Tilana	277	1456
Total		**23503**	**112828**

Source: District Census Handbook, Census of India, 2011

In 2020, the area under the Nalbari MB was increased with the extension of wards from 12 to 17. The following villages are under their jurisdiction:

Table 2-5 Villages under Nalbari MB

Sl_No	Village	Area Included
1	Balikoria	Part
2	Balikoria Kharjara	Full
3	Barkura	Part
4	Bhuyanarkuchi	Part
5	Digheli	Part
6	Japarkuchi	Full
7	Katabari Kanda	Full
8	Kotlabarkuchi	Part
9	Nalbari Gaon	Full
10	Nalbari Town	Full
11	New Borsilakuti Town	Full
12	Sandhakairara	Full

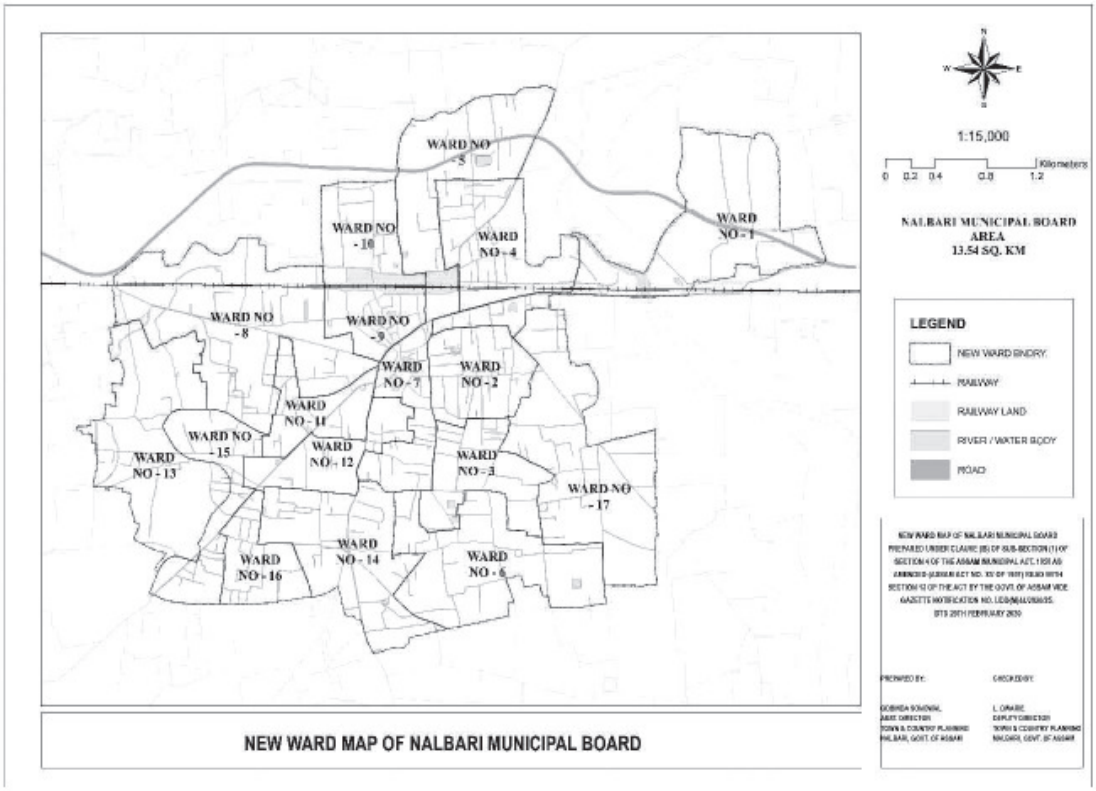

Figure 2-2 Ward Boundary Map of Nalbari Municipal Board

*** It is to be noted that all the demographic statistics and population projection of the Nalbari Municipality Area is based on 12 wards as per the Census, 2011 as data of the newly extended wards are currently unavailable.

2.1.1.3 *Sex Ratio*

The sex-ratio of Nalbari Municipality, according to 2011 census was showing a relevant increase from 1991 census. Whereas, in Master Plan area (other than Municipality area) the figure is comparatively low to previous 2001 census.

Table 2-6: Sex Ratio of Nalbari Town & Master Plan Area

Year	Sex Ratio		
	In Nalbari Municipal Area	In Nalbari Master Plan area (Excluding Nalbari Municipal Area)	Total Master Plan Area (Average)
1991	859	937	898
2001	913	950	932
2011	930	948	939

Source: District Census Handbook, Census of India (71,91,01,11)

2.1.1.4 *Child population:*

As per 2011 Census, out of the total population of the Master Plan Area (140667),11396 are children belongs to the age group 0-6 years and accounts for 8.10% of the total population of the master plan area.

Table 2-7: Child Population of Nalbari Master Plan Area, 2011

Age Group		Male Population	Female Population	Total
0-6	Master Plan Area (*Excluding Municipality*)	4485	4267	8752
	Municipality	1334	1310	2644
Total Population		**5819**	**5577**	**11396**

Source: District Census Handbook, Census of India 2011

Population of Children with age of 0-6 is 2644 which is 9.50 % of total population of Nalbari (MB). Moreover Child Sex Ratio in Nalbari is around 982 compared to Assam state average of 962.

2.1.1.5 *Age-Sex Composition*

Study of Age-Sex composition of population shows that the proportion of population in the age group 7-60+ is increasing. This is indicative of the increase in the participation rate and need of more and better health infrastructure and recreational activities.

Table 2-8: Age-Sex Composition of Nalbari Master Plan Area, 2011

Age Group	Nalbari Municipal Area			Nalbari Master Plan area Excluding Municipal Area		
	Male Population	Female Population	Total Population	Male Population	Female Population	Total Population
0-6	1334	1310	2644	4485	4267	8752
7-60+	13091	12104	25195	53463	50613	104076
Total	**14425**	**13414**	**27839**	**57978**	**54880**	**112828**

Source: District Census Handbook, Census of India 2011

2.1.1.6 *Literacy*

As per 2011 census, out of the total population in municipality area (27839), 22719 persons are declared literate(of which 12176 are Male & 10543 are female)

Table 2-9: Literacy rate of Nalbari Town, 2011

	Male Literate	Female Literate	Total
Master Plan Area (*Excluding Municipality*)	35732	29786	65518
Municipality	12176	10543	22719
Total Literacy	**47908**	**40329**	**88237**

Source: District Census Handbook, Census of India 2011

Literacy rate of Nalbari Town is 81.60 % compared to total population of the town. In Nalbari, Male literacy rate is around 84.40 % while female literacy rate is 78.60 %.

Whereas in the total master plan area, the literacy rate is 62.73 %. The literacy rate of Male is around 61.63 % while female literacy rate is 54.27 %.

2.1.1.7 Population of SCs &STs:

As per 2011 census, the Scheduled Castes and Scheduled Tribe population of the Nalbari Town was 7186 and2408 respectively constitution of 5.1% and 1.71% of the total population of the Master plan area.

Table 2-10: SC-ST Population, Nalbari Town, 2011

	SC Population		ST Population		Total
	Male	Female	Male	Female	
Master Plan Area (*Excluding Municipality*)	2244	2146	1103	1095	6588
Municipality	1382	1414	110	100	3006
Total	**3626**	**3560**	**1213**	**1195**	
Total Population of SC/ST	**7186**		**2408**		**9594**

Source: District Census Handbook, Census of India 2011

2.2 MIGRATION POPULATION

Urbanization refers to the movement of population to reside in urban areas, and the resultant increase in population from rural areas. Urbanization means the movement of people from villages to towns and the effect of this movement upon the migrants and their families and upon their fellowmen in the villages. Urbanization may be defined, as a process of concentration of non-agricultural occupations and land uses around a single nucleus or multiple nuclei.

The migrated population is mainly the working-class population. This population comes to Nalbari town for employment in various sectors such as hotel / restaurant industry, government jobs etc. During the non-agricultural season most of the farmers used to migrate towards the town is generally seen.

There is no such data available for migrated population for Nalbari town and surrounding villages.

2.3 URBAN HOUSING

Traditionally, the people have been living in individual houses made up of bamboo and wood due to easy availability of the raw materials. However, due to increase in population and space constraint there has been unrestricted growth of RCC buildings and multi-storeyed structures. Many of these buildings are not earthquake resistant.

2.3.1 *Household Size*

The average household size of the Nalbari Master Plan area is 4.75 as per 2011 census(Table 2-11).

Table 2-11: Population and Household Size of Nalbari Master Plan Area – 1991, 2001& 2011

Town/ State/ Country	1991			2001			2011		
	Total Population	Number of Households	Household Size	Total Population	Number of Households	Household Size	Total Population	Number of Households	Household Size
Nalbari Master Plan Area	42613	-	-	63700	-	-	140667	29590	4.75
Assam Urban Population	2487795	-	-	3439240	-	-	4398542	-	-
India Urban Population	213,283,817	39,937,922	5.3	280,163,811	54,720,312	5.1	377105760	-	-

Source: Compiled from Housing and Household Tables, Census of India, 1991 & 2001, Provisional Population Totals 2011*

Nalbari Municipal Board has total administration over 6,087 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Municipal Board limits and impose taxes on properties coming under its jurisdiction.

2.4 POPULATION PROJECTION

Population is the most important factor which is directly related to the various needs of the area. The prime objective of any Master Plan is to assess the present situation and project the future population for plan period, and accordingly calculate the requirements of both physical and social infrastructure in order to cater to the needs of such population. Therefore, population projection is the basic requirement for the projection of other needs of the area. From all these projections the developmental plan of an area should be prepared which can fulfill the different needs of the people living therein.

To arrive at a conclusive projection figure, three methods of population projections have been used for the city as well as the whole MP Area. The methods used for projecting population are:

i. Arithmetic Progression Method.

ii. Geometric Progression Method.

iii. Incremental Increase Method.

Based on the past population growth trends– low, medium and high – population estimate for Nalbari Master Plan Area for the year 2041 have been worked out assuming different growth rate for Municipal Area and Master Plan Area, keeping in view the past growth trend.

The following table shows the population of coming few decades with growth rate and projected population for 2041 –

Table 2-12: Population estimates for Nalbari Town- 2041

Method	2021	2031	2041
Arithmetic Progression method	32284	36729	41174
Geometric Progression method	33736	40883	49544
Incremental Increase method	32706	37995	43706
Average	**32909**	**38536**	**44808**

Source: Calculations based on AM, GM & Incr. Incr Method

In the table 2-13, it can be seen that the comparison of population projections done by different methods reveals that Geometric Increase method shows the highest population forecast with the estimation of nearly 7.92 lakhs population by year 2041 in the Nalbari Master Plan Area followed by Incremental Increase method at 6.21 lakhs and by Arithmetic method at 2.88 lakhs.

Table 2-13: Population estimates for Nalbari Master Plan- 2041

Method	2021	2031	2041
Arithmetic Progression method	189811	238955	288099
Geometric Progression method	250341	445524	792886
Incremental Increase method	245457	405893	621975
Average	**228536**	**363457**	**567653**

Source: Calculations based on AM, GM & Incr. Incr Method

The average of all the methods applied for population projection for horizon year 2041 has more relevance to the Master Plan area and shall provide realistic estimates with greater accuracy. Hence, the population estimates derived by taking average of all the three methods has been considered for the Nalbari Master Plan Area. By following this process the population of the Nalbari Master Plan Area shall be 2.28 lakhs, 3.63 lakhs and 5.67 lakhs for the year 2021, 2031 and 2041 respectively.

3. ECONOMIC BASE AND EMPLOYMENT

3.1 INTRODUCTION

Nalbari town has so far developed mainly as an administrative and service center and as such the economy of this urban center like many of the administrative towns shows a preponderance of service sectors over other sectors of employment. To sustain the service population, activities like trade and commerce, transportation, etc. have been developed. In the past very little efforts have been made for the diversification and intensification of economic activities, as a result, service sector emerged as the major source of employment.

The city economic profile has been worked out based on an analysis of the census 2011 data.

3.2 WORK FORCE PARTICIPATION RATE AND NON-WORKERS

As per Census of India, workers are classified as Main Workers, Marginal Workers and Non Workers depending upon their duration of work months. Another classification has been done on the basis of nature of work performed; cultivators, agricultural labourers, household industry labourers and other workers etc.

3.2.1 *Working Population*

The work participation rate of 2011 is 34.80, which is very low compare to 2001 data i.e. 37.83. It can be observed from the table given below.

Table 3-1: Working Population, Nalbari, 2011

Year	Nalbari Municipal Area (A)			Nalbari Master Plan Area (Excluding Municipal Area) (B)			Total Master Plan Area (A)+(B)		
	Total Population	Total Workers	Workers Participation Rate	Total Population	Total Workers	Workers Participation Rate	Total Population	Total Workers	Participation Rate
1991	18949	5203	27.46	23430	9300	39.69	42379	14503	34.22
2001	23183	6805	29.35	40517	17298	42.69	63700	24103	37.83
2011	27839	9601	34.48	112828	39339	34.87	140667	48940	34.80

Source: District Census Handbook, Census of India (91, 01, 11)

3.2.2 *Non-Working Population*

The Non-working participation rate of 2011 is 65.20 which is less than 2001 data i.e. 76.53. It can be observed from the table given below.

Table 3-2: Non-Working population of Nalbari Master Plan Area

Year	Nalbari Municipal Area (A)			Nalbari Master Plan Area (Excluding Municipal Area) (B)			Total Master Plan Area (A)+(B)		
	Total Population	Total Non-Workers	Non-Workers Participation Rate	Total Population	Total Non-Workers	Non-Workers Participation Rate	Total Population	Total Non-Workers	Non-Workers Participation Rate
2001	23183	16181	69.79	40517	32570	80.38	63700	48751	76.53
2011	27839	18238	65.51	112828	73489	65.13	140667	91727	65.20

Source: District Census Handbook, Census of India (01, 11)

3.3 OCCUPATIONAL STRUCTURE:

The working population of Nalbari Master Plan area is engaged more in other types of work (like business, Job etc). The table 3-3 shows the distribution of workers in four categories of economic activity i.e. Cultivators, Agriculture Labourers, Household Industry workers, other workers.

Municipality area contributes 19.62% of total workforce, whereas Master Plan Area (Excluding Municipality) contributes remaining 80.38% of total workforce in Nalbari Master Plan Area.

Table 3-3: Occupational Structure of Nalbari Master Plan Area

Sl. No.	Category	Municipality	Percentage (%)	Male	Female	Master Plan Area *(Excluding Municipality)*	Percentage (%)	Male	Female
1	**Main Workers**	**8922**		**7506**	**1416**	**29247**		**25607**	**3640**
i	Main Cultivators	37	0.41	29	08	3498	11.96	3297	201
ii	Main Agriculture Labourers	26	0.29	22	04	1811	6.19	1591	220
iii	Main Household Main Industry workers	111	1.25	88	23	1444	4.94	1069	375
iv	Other workers	8748	98.05	7367	1381	22494	76.91	19650	2844
2	**Marginal Workers**	**679**		**394**	**285**	**10092**		**6289**	**3803**
i	Marginal Cultivators	18	2.65	6	12	563	5.58	444	119
ii	Marginal Agriculture Labourers	8	1.18	6	2	1140	11.30	805	335
iii	Marginal Household Industry workers	19	2.80	13	6	1421	14.08	566	855

iv	Marginal Other workers	634	93.37	369	265	6968	69.04	4474	2494
Total Workers (Main + Marginal)		**9601**		**7900**	**1701**	**39339**		**31896**	**7443**

Source: District Census Handbook, Census of India 2011

3.4 INFORMAL SECTOR

Nalbari informal sector activities are scattered in the town. These activities will be swollen beyond manageable limits with the induced growth in future. Hence, for these, proper provision for space should be considered. These informal sector units have located themselves strategically near work centres, commercial areas, outside the boundaries of schools, colleges and hospitals, transport nodes and near large housing clusters and they created numerous problems in the efficient functioning of the city including traffic and transportation.

The informal sector must be made an integral component of the city planning and development process in order to rationalise the city's growth and development. Options for creating more affordable commercial areas in terms of day markets need to be explored in order to enable the informal sector to contribute to the economic growth of the city.

3.5 MAJOR WORK AREAS- TRADE AND COMMERCE

Nalbari town, over the years has been a fast growing trade &commerce centre. The business activities of the town have not developed for a particular trade, in a particular area but it is spread widely along main thoroughfares. Commercial activities in the town serve an area of about 20 Km. radius. As per data provided by the Municipal Board of Nalbari there are large numbers of shops of all type in the town.

3.5.1 *Wholesale Trade:*

The wholesale trade in the town is mixed with the retail trade. There are altogether 45 Nos. of wholesale commercial establishment which are scattered all over the city especially along the N.T Road, out of which food grain wholesale trade is of 21 re-dominant nature. The area coming under wholesale trade is quite nominal. Since there is space constraint in the town, it is feasible to shift further wholesale activities in the outskirts, predominantly along the NH 31 where composite zone has been proposed.

3.5.2 *Retail Trade:*

There are altogether 1988nos. of retail commercial establishment at Nalbari Town. The retail activities are mostly concentrated on both sides of N.T. Road, P.N.C. Road, Barama Road Palla Road, etc. The shopping activities are mainly concentrated in the heart of the town. Retail trade centre have developed haphazardly along the roads with the result that Truck Parking, Loading / unloading activities are taking place along the road, creating problem to traffic flow.

3.5.3 *Market/Shopping Centre:*

As per data provided by the Municipal Board of Nalbari, there are largely 5 numbers of Municipal Market existing in the Town& they are Bamboo Market, Hatkhola, behind B.S.N.L Office; Cattle Market, near Samshan Bhumi; Daily Market, Hatkhola; Sabji Market, Hatkhola; Fish Market, Hatkhola.

Though there are 3 Nos. of shopping centres Viz. Choudhury Market, Barua Market and Bohagi Bazar Market at Nalbari town. These are not upto the standard.

3.6 INDUSTRIAL DEVELOPMENT

Nalbari district is industrially very backward. There is no heavy industry. Small industries like Handloom are found mainly in rural areas, especially in tribal areas. Sericulture is also an important subsidiary occupation of the tribal. There are some weaving centers also. Nalbari is famous for cane and bamboo products. These products are sold all over the state as well as outside the state also.

At present, the city has 80 small-scale industries with an average of 6-7 employee involvement. These are mostly bakeries, automobile workshops, printing press, radio repairs and furniture making, etc.

3.6.1 *Industrial Estates*

Industrial estates have been setup in the city of Nalbari by Department of Industries under State Govt. Policy to facilitate industrial development in cities with potential for industrialization.

Table 3-4: Number of Registered IE units under the Commissionerate of Industries and Commerce, Assam 2018-19:

Name of Industrial Estate	Total Area (in Sq. Mtr.)	Total No. of Sheds Constructed	No. of Sheds Allotted	Open Area Allotted (in Sq. M)	No. of Units Functioning
Nalbari	48776	25	21	13951	10

Source: Statistical Handbook Assam 2019

Table 3-5: Number of Registered MSME units under the Commissionerate of Industries and Commerce, Assam 2018-19:

Micro	Small	Medium	Total
53	3	0	53

Source: Statistical Handbook Assam 2019

Other industrial units of the planning areas are manufacturing of steel and wooden furnitures, rice milling, bakery products, tailoring, readymade garments, embroidery, handloom, spice grinding, repairing of 4 wheelers and 2 wheelers, DTP works, cement concrete products.

3.7 TOURISM

Tourism in Assam is based on wildlife, natural beauty, unique flora & fauna, holy shrines, lush green tea gardens, turbulent rivers, vibrant and colourful cultural festivals.

Nalbari has a beautiful landscape which helps the city in being an important tourist place of Assam. Places of major tourist attraction are Kohua (Eco tourism); Pagladia (Eco tourism); Hari Mandir, Nalbari especially during Raas Mahotsava; Balilesha Kali Devalaya Nalbari; and Billeswar Devaloya, Belsor. The city is famous for its many temples. The temples that are found here in Nalbari ranges from newly constructed ones to ancient monuments.

There are 7 Nos. of hotels, guest houses and Lodges in Nalbari with about 70 nos. of room available

Table 3-6: Tourist Trend in Nalbari

April 2020- March 2021	Domestic	International
	350	Nil

Source: Tourist Information Office, Nalbari

4. HOUSING AND SHELTER

4.1 HOUSING SCENARIO

Nalbari has witnessed alarming urbanisation in the recent years. The population of Nalbari Municipal area has seen an increase of 20.08% from 23183 in 2001 to 27839 in 2011 according to Census data 2011. Similarly areas under Nalbari Master Plan excluding municipal area have seen an increase of 11.39% from 101284 in 2001 to 112828 in 2011. This calls for construction of more houses. Defined narrowly, housing is just a unit of accommodation to protect its occupants from forces of nature, but defined more broadly, it also covers basic ancillary amenities like proper drainage, sanitation, power supply, water supply, health care, etc. to lead a dignified life.

In the recent years, horizontal and vertical growth of Nalbari is taking place. Congestion and overcrowding is being seen. Open spaces are shrinking and agricultural lands are being converted for residential, commercial, and transportation purposes. Urbanisation in Nalbari has imposed tremendous pressure on natural resources, particularly the groundwater level.

While most of the houses in Nalbari are self-built, a few central and state government schemes are also in place to facilitate house construction. Private builders haven't entered the housing scenario yet.

4.1.1 *Types of Housing*

Basically, there are three different types of houses found in Nalbari:

- **Kutcha House:** A house having mud floor, bamboo wall plastered with mud and thatch roof.
- **Assam Type (Semi Pucca):** A house having brick wall, cement concrete flooring, CGI/AC sheet roofing.
- **Pucca House:**A house having cement concrete flooring, brick wall and RCC slab roofing.

Besides, the houses being built are often rented out. The following Table depicts the percentage of self-occupied and rented houses in Nalbari District Census Handbook 2011.

Table 4-1: Housing Typology of Nalbari MP Area

Area Name	Ownership Status		
	Owned	Rented	Any Others
Nalbari Municipal Area	65.6	30.15	4.26
Nalbari Master Plan Area (excluding the municipal area)	96.39	2.83	0.77
Total Master Plan Area	**91.88**	**6.83**	**1.27**

Source: District Census Handbook, Census of India 2011

As is evident from the **Table 4-1**, 30.15% of houses in Nalbari Municipal Area are rented. This implies a huge influx of people from other areas especially the rural areas to Nalbari town in search of better economic activities. While this has cast a pressure on the natural resources, it has also led to a new source of income to the people renting their houses and an increased demand for construction workers and construction materials, thereby generating a greater income flow.

4.2 HOUSING SUPPLY MECHANISM:

Majority of the houses in Nalbari are self-built but there are government schemes in place to meet the current demand and to provide affordable housing to economically weaker sections and low income groups.

4.2.1 *Schemes currently in operation in Nalbari are:*

i. **Integrated Housing & Slum Development Programme (IHSDP):** This scheme was launched in December 2005. The objective is to provide an integrated approach to ameliorate the conditions of slum dwellers who do not possess adequate shelter and basic facilities, to strive for slum less cities with healthy living and good environment and to enhance public and private investments in housing and infrastructure development in urban areas.

ii. **Prime Minister Awas Yojana (Urban) [PMAY (U)]:** This scheme launched in 2005 aims to provide housing for all in the urban areas by 2022. The mission seeks to address the housing requirement of urban poor including slum dwellers through the following programme verticals:

- Slum rehabilitation of slum dwellers with participation of private developers using land as a resource.
- Affordable housing through credit linked subsidy.
- Affordable housing in partnership with public and private sector.
- Subsidy for beneficiary led individual house construction/enhancement.

iii. **Individuals Household Latrine (IHHL) under Swachh Bharat Mission (SBM):** IHHL under SBM aims to eliminate open defecation in the country. Here applicants can approach the local authorities in their area to get central assistance for construction of toilets. They can also complete the process online through an official portal of the central government. Conversion of old toilets can also be applied for.

iv. **National Urban Livelihood Mission (NULM):** Launched in 2013, NULM focuses on organizing urban poor in their strong grassroots level institutions, creating opportunities for skill development leading to market based employment and helping them set up self-employment venture by ensuring easy access to credit. In addition, the mission is aimed at providing shelters equipped with essential services to the urban homeless in a phased manner and also to address livelihood concerns of the urban street vendors.

4.3 NALBARI HOUSING STATUS

4.3.1 *Housing Condition:*

The condition of households (HHs) can be categorised as good, liveable, and dilapidated. The following table provides information on the condition of housing stock in Nalbari:

Table 4-2:Overall Housing Condition of Nalbari MP Area

Condition of Census Households as	Percentage of Households		
	Nalbari Municipal Area	Nalbari Master Plan Area (*excluding MB area*)	Total Master Plan Area
Good	54.68	35.61	45.13
Livable	42.48	57.93	50.21
Dilapidated	2.84	6.46	4.66
Total	100.00	100.00	

Source: District Census Handbook, Census of India 2011

From the **table 4-2**, it is evident that most of the people in Nalbari Master Plan area live in good and livable condition of houses. Dilapidated houses account for 6.46% in the master plan area. Government schemes are in place to provide assistance for upgradation of these houses.

Table 4-3: HHs Condition as Residence of Nalbari MP Area

Condition of Census Households as Residence	Percentage of HHs		
	Nalbari Municipal Area	Nalbari Master Plan Area (*excluding MB area*)	Total Master Plan Area
Good	49.44	35.36	42.40
Livable	41.21	57.31	49.26
Dilapidated	2.81	6.43	4.62

Source: District Census Handbook, Census of India 2011

Table 4-4: HHs Condition as Residence-cum-other Use of Nalbari MP Area

Condition of Census Households as Residence	Percentage of HHs		
	Nalbari Municipal Area	Nalbari Master Plan Area (*excluding MB area*)	Total Master Plan Area
Good	5.23	0.24	2.74
Livable	1.28	0.62	0.95
Dilapidated	0.03	0.3	0.17

Source: District Census Handbook, Census of India 2011

4.3.2 *Type of structure:*

The structure of households can be classified as follows:

- **Permanent:** Houses with wall and roof made of permanent materials. Walls can be made of G.I, stone packed with mortar, Stone not packed with mortar, metal, asbestos sheets, burnt bricks, stones or concrete. Roof can be made of hand-made tiles, machine made tiles, G.I, Metal, asbestos sheets, brick, stone or concrete.
- **Temporary:** Houses with wall and roof made of temporary materials. Wall and roof can be made of grass, thatch, bamboo, plastic, polythene, mud or wood.
- **Semi-Permanent :** Either wall or roof is made of permanent material or the other is made of temporary material.
- **Serviceable:** Wall is made of mud, un burnt brick or wood.
- **Non-serviceable:**Wall is made of grass, thatch, plastic or polythene.

The following table depicts data on the type of structure of households in Nalbari:

Table 4-5: Housing Structure of Nalbari MP Area

Type of structure		Percentage of Households		
		Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area
Permanent		71.80	35.97	53.88
Semi-permanent		27.66	61.98	44.82
Temporary	Total	0.45	1.99	1.22
	Serviceable	*0.10*	*0.08*	
	Non-serviceable	*0.35*	*1.91*	
Unclassifiable		0.09	0.04	0.06
Total		**100**	**100**	

Source: District Census Handbook, Census of India 2011

Most of the people in Nalbari Municipal area live in permanent structures constituting of 71.8%.While a majority of 44.82% live in semi-permanent structures of Total Master Plan area indicating backwardness of the region as a whole.

4.3.3 *Type of Material*

The following table depicts data on the type of predominant material of roof occupiedby households in Nalbari.

Table 4-6: Housing roofing Material of Nalbari MP Area

Material	Percentage of HHs		
	Nalbari Municipal Area	Nalbari Master Plan Area (*excluding MB area*)	Total Master Plan Area
Grass/Thatch/Bamboo/ Wood/Mud etc.	0.23	1.13	0.68
Plastic/ Polythene	0.33	1.06	0.69
Handmade Tiles	0.13	0.09	0.11
Machine made Tiles	0.02	0.001	0.01
Burnt Brick	1.57	0.11	0.84
Stone/ Slate	0.23	0.20	0.21
G.I./Metal/Asbestos sheets	87.61	97.09	92.35
Concrete	9.84	0.29	5.06
Any other material	0.05	0.01	0.03
Total	**100**	**100**	

Source: District Census Handbook, Census of India 2011

Majority of the people in Nalbari Total master plan area used G.I./Metal/Asbestos sheets in their roofing constituting of 92.35%.

4.3.4 *Availability of Kitchen:*

The following table depicts the availability of kitchen in Nalbari households:

Table 4-7:Availability of Kitchen in Nalbari MP Area

Kitchen Facility		Percentage of households		
		Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area
Cooking inside house	Has Kitchen	82.77	89.90	86.33
	Does not have kitchen	10.74	1.66	6.2
Cooking outside house	Has kitchen	5.02	6.28	5.65
	Does not have kitchen	1.04	2.06	1.55
No Cooking		0.42	0.08	0.25
Total		**100**	**100**	

Source: District Census Handbook, Census of India 2011

A majority of 82.77% in Nalbari Municipal Area and 89.90% in Nalbari Master Plan area have kitchen inside their houses. These houses rely mostly on LPG/PNG for cooking purposes. 5.02% in Nalbari Municipal Area and 6.28% in master plan area have kitchen outside their houses. They rely mostly on firewood, crop residue, cow dung cake, and kerosene for cooking.

4.3.5 *Availability of Latrine:*

The following table depicts the availability of latrine facility in Nalbari households:

Table 4-8 : Availability of Latrine in Nalbari MP Area

Latrine Facility			Percentage of households		
			Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area
Percentage of households having latrine	Flush/pour flush latrine	Piped sewer system	18.50	7.37	12.93
		Septic tank	42.37	12.37	27.37
		Other system	2.68	6.98	4.83
	Pit latrine	With slab/ventilated improved pit	23.03	16.12	19.57
		Without slab/open slab	7.76	26.99	17.37
	Night soil disposed into open drain		0.23	0.75	0.49
	Service latrine	Night soil removed by human	0.00	0.25	0.12
		Night soil serviced by animal	0.00	0.37	0.18
Households not having latrine			5.4	28.76	17.08
Total			100	100	

Source: District Census Handbook, Census of India 2011

As per the census of 2011, a huge chunk of 28.76% of the households in Nalbari Master Plan area did not have latrine in their house premises. They depended on public latrine or open defecation. The coverage of outdated facilities like pit latrine was also substantial in both Nalbari Municipal Area and Nalbari Master Plan Area. However, it is to be noted that under the IHHL category of Swachh Bharat Mission, latrines have been constructed across households in the Nalbari district. The outdated and dysfunctional toilets have also been upgraded. Consequently, in August 2017, the entire Nalbari district was declared Open- Defecation Free (ODF).

4.3.6 *Availability of Bathroom:*

The following table depicts the availability of Bathroom in Nalbari households:

Table 4-9:Availability of Bathroom in Nalbari MP Area

Bathroom facility		Percentage of Households		
		Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area
Yes	Bathroom	73.89	36.03	54.96
	Enclosure without roof	15.20	25.13	20.17
No		10.90	38.83	24.86
Total		100	100	

Source: District Census Handbook, Census of India 2011

In Nalbari Master Plan area, 24.86% of the households do not have bathroom in their house. This reflects the backwardness of the master plan area.

4.3.7 *Availability of Drainage:*

The following table depicts the availability of drainage facilities in Nalbari Households.

Table 4-10:Availability of drainage in Nalbari MP Area

Waste water outlet connected to-	Percentage of households		
	Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area
Closed Drainage	17.50	1.88	9.69
Open Drainage	33.38	10.80	22.09
No Drainage	49.12	87.32	68.22
Total	**100**	**100**	

Source: District Census Handbook, Census of India 2011

The drainage system in Nalbari is pathetic. Only 17.50% in Nalbari Municipal Area and 4.16% in Nalbari master plan area has access to closed drainage facility. As high as 49.12% in Nalbari Municipal Area and 81.73% in Nalbari Master Plan Area do not have any drainage facility. This paints a dire picture of the sanitation infrastructure in the region.

4.3.8 *Houses for Married Couples and its deficient:*

The following table depicts the Households having no. of Roomsavailable for Married Couples in Nalbari.

Table 4-11: Percentage of Married Couples in a Household

No. of Married Couples in a Household	Percentage of Married Couples in a Household			
	Nalbari Municipal Area	Master Plan Area (*excluding MB area*)	Total Master Plan Area	
			(%)	Value
None	13.12	9.53	11.33	3353
1	74.82	74.11	74.47	22036
2	8.99	13.01	11.00	3255
3	2.35	2.57	2.46	728
4	0.57	0.59	0.58	172
5+	0.15	0.19	0.16	47
Total	**100**	**100**	**100**	**29590**

Source: District Census Handbook, Census of India 2011

Most of the Married couples in Nalbari total master plan area live in single HHs constituting of 74.47%.

Table 4-12: Deficient houses for Married Couples in Nalbari MP Area

No. of Married Couples in a Household	Total Number of Household	No exclusive room
None	3353	38
1	22036	246
2	3255	36
3	728	8
4	172	2
5+	47	1
Total	**29590**	**331**

Source: District Census Handbook, Census of India 2011

Housing deficiency or Congestion Factor for Married Couples is about 331 rooms. This indicates Rental housing demand in Nalbari MP Area.

4.4 SLUMS-SQUATTERS AND INFORMAL HOUSING SHARE

The following table depicts the availability of drainage facilities in Nalbari Households:

Table 4-13: Informal Housing in Nalbari MP Area

Year	Name of the town having slum	Total Urban population	Slum Population	Slum HHs	Percentage of slum population to total population
2001	Nalbari MB	23183	10000	2000	43.14
2011	Nalbari MB	27839	5360	1175	19.25

Source: District Census Handbook, Census of India (01, 11)

The table 4.13 depicts the Proportion of slum population in towns. In the district only one slum in Nalbari (MB) is seen with slum population of 5360. The percentage of slum population to total population as seen in the table is 19.25 percent.

4.5 HOUSING SITUATION

4.5.1 *Household Family size*

The following table shows the no. of person per house in Nalbari MP area

Table 4-14: Family household size in Nalbari MP Area

Year	Number of Residential Houses	Total Population	Number of Persons per Houses
2011	29590	140667	4.7
	(23503+6087)	*(112828+27839)*	

Source: District Census Handbook, Census of India (01, 11)

4.5.2 *Housing Shortage*

Housing shortage in Nalbari Master Plan Area considering census 2011 housing data has been taken into consideration.

Table 4-15: Factors taken into considerations for Housing Shortage

Sl. No	Factors	Description	Remarks
1	Obsolescence factor	As decided by ninth plan working group committee of GoI, dwelling units aged 80 years or more are treated as obsolete. Percentage of households living in the dwelling units having age 40-80 years are in bad condition and percentage of households living in all structures aged 80+ years, irrespective of condition of structure, taken together as obsolescence factor and considered as housing requirement.	**1379 HHs** *[4.66 % of total no. of HHsin Master plan area are in dilapidated condition (refer in Table 4-2)]*
2	Temporary housing	All temporary houses should be considered as housing requirements as per recommendations. According to census data both Temporary houses and unclassifiable houses should be taken into consideration to arrive at the total number of temporary housing	**379 HHs** *[(1.22%+0.06%)of total no. of HHs in Master plan area lived in temporary structure. (refer in Table 4-5)]*

3	Houses with predominantly katcha or semi pucca roof material	Houses with Katcha and Semi Pucca roof in the cities are considered to be contributing towards the actual housing stock	**698 HHs** *[2.36% of of total no. of HHs are made up of temporary roofing in Master plan area(refer in Table 4-6)]*
4	Congestion factor	Congestion factor is defined as the percentage of households in which each married couple does not have a separate room to live. The congestion factor worked out by utilizing the data on household size and average number of rooms available	**331 HHs** *[Housing deficiency or Congestion Factor for Married Couples (refer in Table 4-12)]*

Source : Assam Urban Affordable Housing & Habitat Policy
Analysis by DD Dist. office, Nalbari

Therefore the total housing shortage for Nalbari Town is calculated as follows:

Table 4-16: Computation of Current Housing Shortage in Nalbari

Parameter	Number of Housing Units
1. Obsolescence factor	1379
2. Temporary housing	379
3. Houses with predominantly katcha or semi pucca roof material	698
4. Congestion factor Housing Deficiency or Congestion Factor for Married Couples (*Rental housing demand*)	331
Total Housing Shortage	**2787**
Total HHs in Nalbari MP area *(as per 2011 census)*	**29590**
Housing Shortage in percent (Housing Shortage / No. of Urban HHs)	**9.42 %**

Source: Calculated Values

Based on the above**table 4-16**, in 2011 the housing shortage works out to be around 2787.

4.5.3 *Housing Need assessment*

The numbers of dwelling units are available in comparison to the total population reveals that there is congestion both in the town as well as in surrounding village within Master Plan Area. So there will be a demand of additional houses in the MP area in future.

The projected housing requirement in Nalbari Master Plan area in 2041 is as under:

Table 4-17: Future Housing Shortage in Nalbari MP Area in a decade

Year	Projected Population	Incremental Population in a decade	No. of persons per households	No. of HHs needed	No. of HHs Available	Housing Demand	Shortage in 2011	Total Deficit
2011	140667	-	4.7	29929	29590	339	2787	3126
2021	228536	87869	4.7	48625	-	19035	-	22161
2031	363457	134921	4.7	77331	-	28707	-	50867
2041	567653	204196	4.7	120777	-	43446	-	94313

Source: Calculated Values

It is seen from Table 4-17 that Nalbari MB/Development Authority needs to provide for about 0.94 lakh new housing units to be distributed in the existing and new developments in the next 30 years.

Also, it is enunciated to provide 20% allocation of dwelling units in the flatted group housing projects for Economically Weaker Section (EWS) and Low Income Group (LIG) preferably at cross-subsidized rates.

4.6 IDENTIFICATION OF SUITABLE GOVT. /ULB LAND FOR AFFORDABLE HOUSING

There are government land parcels in and around the Nalbari town. This provides immense scope of private investments in these lands. Different models of PPP can be adopted to make use of these underutilized lands and move closer to the target of achieving Housing For All by 2022. Private real estate developers should be invited to partner with the government to build affordable residential projects. This will ensure efficiency and faster delivery of houses.

5. TRANSPORTATION

5.1 INTRODUCTION

Transport is the backbone of economy and social structure of any region. If urban centres have been recognized as engines of Economic growth, Traffic and Transportation has rightly been termed as wheels of such engines. Road and Rail network plays a vital role in the urban planning and traffic & transportation has been considered as a function of land use planning. Transport network is considered as the life line of the city and if any bottleneck or obstruction comes in between it poses a severe threat to day to day life of the city people. The good road and rail network is the symbol of the sound development of any city and the study of transportation helps in understanding the existing situation, potentials, weaknesses etc. and helps to draft out strategies and projects for the future development.

In Nalbari, the movement of goods and passenger traffic mainly takes place by the side of the roads as well as railways. Within the town, different type of land uses has been connected by roads. There are 1,48,994 no. of vehicles (all types) registered in Nalbari Dist. (*Statistical Hand Book Assam 2019)*

The road network has been studied in terms of classification of roads, length of roads, cross section of roads (divided and undivided carriageways), area under major existing roads and major road intersections. Available data regarding rail network has also been studied.

5.2 ROAD NETWORKS OF NALBARI

Nalbari is well served by roads connecting it to various cities of other districts and within district. One National Highway i.e. (N.H.-31) passes through the northern side of the town which provides inter-district and inter-state transport facility as it connects Nalbari with Guwahati and other urban centers of the State and outside the State.

This Highway has Right of Way varying from 24m to 30m. Besides this the town is connected by roads with Dhamdhama towards north and with Barpeta via Chamata (Palla Road). Moreover, there is another road which connects it with Guwahati via Hajo towards south. The importance of this road has been increasing as a huge No. of private buses coming to and going from Nablari passes through it.

5 major railway crossing at the entrance to the Nalbari Town Area are Barkura Chowk, Durga Mandir Railway Crossing, Crossing near Railway Station, Hari Mandir Railway Crossing, Sandha Railway Crossing.

Table 5-1: Length & width of Major Roads in Nalbari within Planning area Limit

Sl. No	Description	Nalbari Town Roads						
1	Name of the Road	NT Road	Hajo Road	P.N.C Road	Barua Road	Palla Road	Dhamdhama Road	Balilesha Road
2	Road width in Metre	6	6.2	5.6	7.5	7	6.1	4.5
3	No. of Major intersection	3	1	2	2	2	2	1

4	Traffic Type (Fast/Slow)	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
5	Parking onside/off-side	Onside	Onside	Onside	Onside	Onside	Onside	Onside
6	Foot Path (A portion/Nil)	Average	Average	Average	Average	Average	Average	Average

5.2.1 *Circulation Pattern*

The road system is very much irregular in Nalbari M. P Area. The concept of road hierarchy is almost missing. There is complete lacking of road hierarchy. The category of roads can be defined only as P.W.D., local body and village road etc.

5.2.2 *Traffic Volume at Major Location*

Traffic volume surveys conducted along the major transport routes and at the major intersection. This was carried out in order to generate idea about the traffic volume along the major routes and at the major intersections, the peak hour timing and the peak hour traffic and also the total day and the peak hour traffic composition.

Table 5-2: Traffic Volume Survey 2019 (Sep), Nalbari Town, Morning Peak Hours (8 A.M to 11 A.M) - Incoming

Sl. No	Location	M-Cycle/Scooter	Car	Bicycle	E-Rickshaw	Rickshaw	Auto/Tempo	Mini-Bus/ Traveller/ Winger	Truck	Bus	Thela	Tractor	Mini-Truck, Ape, Pick-Up	Total
1	CHOWK BAZAR	1236	290	433	240	44	205	23	7	1	13	7	31	**2530**
2	NT ROAD	857	71	412	126	28	90	2	3	3	19	2	53	**1666**
3	DIGHELI BLOCK CHOWK	269	28	242	35	14	22	0	0	0	3	1	19	**633**
4	PALLA ROAD	800	337	374	231	72	232	22	5	13	7	9	39	**2141**
5	BARAMA ROAD	1098	264	509	233	25	170	19	4	3	9	4	61	**2399**
6	DHAMDHAMA ROAD	541	60	652	128	19	135	21	6	12	9	0	10	**1593**
TOTAL		**4801**	**1050**	**2622**	**993**	**202**	**854**	**87**	**25**	**32**	**60**	**23**	**213**	

Source: Survey Conducted By Town & Country Planning Assam, Dist Office: Nalbari

In the morning time, it has been observed that a highest no. of 2530 vehicles entered Chowk Bazar area with highest no of 1236 Motor cycle/Scooter in it.

Table 5-3: Traffic Volume Survey 2019 (Sep), Nalbari Town, Morning Peak Hours (8 A.M to 11 A.M) - Outgoing

Sl. No	LOCATION	M-Cycle/scooter	CAR	BICYCLE	E-RICKSHAW	RICKSHAW	AUTO/TEMPO	MINI-BUS/TRAVELLER/WINGER	TRUCK	BUS	THELA	TRACTOR	MINI-TRUCK, APE, PICK-UP	Total
1	CHOWK BAZAR	560	192	210	256	23	176	33	1	6	3	4	20	**1484**
2	NT ROAD	402	72	201	42	9	33	2	1	1	10	1	23	**797**
3	DIGHELI BLOCK CHOWK	117	12	60	21	3	10	0	0	0	0	1	2	**226**
4	PALLA ROAD	568	204	245	216	44	146	21	3	9	6	3	22	**1487**
5	BARAMA ROAD	820	229	226	236	12	121	12	14	7	7	2	36	**1722**
6	DHAMDHAMA ROAD	255	21	133	100	6	50	12	0	6	10	2	7	**602**
TOTAL		**2162**	**538**	**865**	**615**	**74**	**360**	**47**	**18**	**23**	**33**	**9**	**90**	

Source : Survey Conducted By Town & Country Planning Assam, Dist Office : Nalbari

Table 5-4 : Traffic Volume Survey 2019 (Sep), Nalbari Town, Evening Peak Hours (3 P.M to 6 P.M) - Incoming

Sl. No	LOCATION	M-Cycle/scooter	CAR	BICYCLE	E-RICKSHAW	RICKSHAW	AUTO/TEMPO	MINI-BUS/TRAVELLER/WINGER	TRUCK	BUS	THELA	TRACTOR	MINI-TRUCK, APE, PICK-UP	TOTAL
1	CHOWK BAZAR	1184	200	229	212	39	128	27	5	14	7	0	48	**2093**
2	NT ROAD	620	70	199	96	18	51	51	0	0	3	1	51	**1160**
3	DIGHELI BLOCK CHOWK	191	11	138	29	4	12	2	2	0	2	1	22	**414**
4	PALLA ROAD	1179	214	318	227	30	148	17	1	8	6	1	44	**2193**
5	BARAMA ROAD	825	210	215	249	23	85	20	3	18	8	3	35	**1694**
6	DHAMDHAMA ROAD	384	30	212	129	8	39	14	3	12	2	1	16	**850**
TOTAL		**4383**	**735**	**1311**	**942**	**122**	**463**	**131**	**14**	**52**	**28**	**7**	**216**	

Source: Survey Conducted By Town & Country Planning Assam, Dist Office: Nalbari

Table 5-5: Traffic Volume Survey 2019 (Sep), Nalbari Town, Evening Peak Hours (3 P.M to 6 P.M) - Outgoing

Sl. No	LOCATION	M-Cycle/scooter	CAR	BICYCLE	E-RICKSHAW	RICKSHAW	AUTO/TEMPO	MINI-BUS/TRAVELLER/WINGER	Truck	BUS	THELA	TRACTOR	MINI-TRUCK, APE, PICK-UP	TOTAL
1	CHOWK BAZAR	1180	245	373	274	24	134	42	4	5	45	1	40	**2367**
2	NT ROAD	623	83	220	72	11	61	1	2	0	4	0	43	**1120**
3	DIGHELI BLOCK CHOWK	218	10	143	30	5	20	1	2	0	7	1	18	**455**
4	PALLA ROAD	1345	259	302	187	47	195	19	1	15	15	2	66	**2453**
5	BARAMA ROAD	842	251	291	227	35	99	7	9	4	5	2	32	**1804**
6	DHAMDHAMA ROAD	419	28	319	122	13	55	9	4	10	15	2	19	**1015**
TOTAL		**4627**	**876**	**1648**	**912**	**135**	**564**	**79**	**22**	**34**	**91**	**8**	**218**	

Source : Survey Conducted By Town & Country Planning Assam, Dist Office: Nalbari

5.3 OVERVIEW OF CRITICAL ROADS AND THEIR IMPROVEMENT

The road junctions namely Bata Chowk, Boro Masjid Chowk and junction of Hajo Road and P.N.C. Road in front of Police Station are critical in Nalbari town. The junctions are defective and instead of facilitating the movement of traffic, they serve as obstacles. The road junction with Dhamdhama Road with National Highway at the entrance to the town is not as per specification.

The railway lines passes through the town and hence there are quite a no. of level crossing. The railway station has an over bridge for the pedestrian traffic only. The most critical level crossing are on the Dhamdhama road near Hari Mandir and on the Barama Road at Barkura Chowk. As almost all the traffic except the traffic coming via Hajo enter the town passing these crossings, traffic bottlenecks are created at these points during the closure of the gate.

The existing roads are proposed to be upgraded in terms of ROW, capacity and other geometrics. The new roads need to be planned and designed for a higher level of service from their entry into Nalbari to their meeting with the peripheral Ring Road and other roads. Within the core area, the roads will lose their characteristics and are to be developed as all purpose roads.

5.4 BUS TERMINALS, BUS STOPS, INFRASTRUCTURE ISSUES

In Nalbari there are two bus terminals viz. private and A.S.T.C. located nearer to each other in the central part of the town. There are no truck terminals and other parking space in the town. The private bus stand occupies an area less than one hectare, is not adequate to accommodate the huge no. of buses.

Commercial development have been taking place in and around the bus-stand which creates problem in its functioning. The Hajo bound buses and the Dhamdhama bound buses have to stand along the road-side which create traffic bottleneck during peak-hour.

5.5 FREIGHT ZONES AND LOGISTICS

As Nalbari is favourably located in proximity to the state capital, a provision of efficient goods transportation facility is important to promote trade and commerce, and in turn economy ofthe town. Since the town has an agro based economy with horticulture produces, there is lot of goods movement between the towns and surrounding villages/region, which can also be anticipated in the future.

Proposed extension of the freight complex and proposed industrial area will also generate goods traffic not only seasonally but throughout the year. To provide them a permanent and formal parking space, a Truck Terminal has been proposed near the industrial zone.

The truck terminus will have major components like packaging, office complex, restaurant, accommodation, parking and other ancillary facilities. It has to be developed in phases to avoid the creation of surplus infrastructure. Truck Terminal will be designed for the idle parking of the trucks and carriers/containers. Keeping all these aspects in mind the proposed truck terminal/ logistic hub is strategically located on outer ring road.

5.5.1 *Movement of Goods Modes*

The movement of goods modes on the road network needs to be rationalized. Goods modes can be grouped into three types as under:

- **Small sized vehicles like pickups:**

Small size vehicles like 'Pick ups' perform an essential distribution function. In space occupancy and manoeuvrability they are similar to cars. Their movement on all road sections, at all times of day may be permitted. As part of traffic management plans, separate parking areas for 'Pick ups' may be identified.

- **Medium sized vehicles like LCVs and**

Medium size vehicles like LCVs are important to move goods to and from industries, warehouses and other major activities. They affect overall level of service of traffic. Since, relocation of wholesale trade and a composite zone is proposed along the NH 31, a parking for these vehicles is proposed at the urban periphery.

- **Large size vehicles like 2/3 Axle Trucks, Truck Trailer & MAVs**

Large sized goods vehicles consume high proportion of road capacity, impede traffic flows, causes accidents, adversely affect environment and consume large extent of land for parking. As these vehicles are bringing in/taking out traffic from/to other parts of the country, these vehicles need to be received at the urban periphery and facilitated in terms of planned terminals. Major truck terminal sand/or idle parking are proposed.

5.6 FOOTPATHS AND BICYCLE TRACKS

As there is no footpaths and bicycle tracks easily visible in the Town. People often seen walking on the road creates slow moving of traffic. Also Road sides encroachment by the informal Sector on the footpaths creates haphazard in facilitate smooth movement of Traffic.

5.6.1 *Pedestrian Facilities*

Walking is a predominant mode in the city. The transport system plan promotes and facilitates walking. The main strategies and measures proposed as part of the plan are as under:

- Provision of side-walks on primary arterials, sub-arterials and collectors on both sides of the road and on at least one side on local roads;

- Cross pedestrian facilities to be provided as per the warrants recommended by Indian Roads Congress;
- Side- walks on all the major roads;
- Improvement measures in terms of pedestrian controlled facilities at intersections, grade separators and widening of side- walks in the Central Area and along major corridors.

5.7 PARKING: ON-STREET AND OFF-STREET

There is no any on- street, off-street provision of parking in the Town. The Town has high inadequacy of organized parking space for the motorized vehicle. The cars are parked in the main road of the town creating congestion. The roads are already over burden with traffic and encroachment.

5.7.1 *Parking Policy:*

Every vehicle trip ends in a demand for parking of the vehicle at its trip end. The parking of vehicles needs extensive and exclusive land area. Otherwise parking would spill over to other use areas like road carriageway and footpaths, open spaces. In turn they affect safety and environmental quality.

The escalating demand and varied needs of parking in Nalbari can only be met and organized in the framework of a comprehensive Parking Policy. Parking policy needs to move from 'non-restrictive' to 'restrictive' policy. 'Restrictive' policy would include from banning of parking to restricted provision, regulation and pricing of parking spaces. However, the recommended parking policy for the town should have the following salient features as per the Urban National Transport Policy (NUTP)-2006:

- Preferential allocation of parking space(s) for public transport vehicles and non-motorized modes of transport;
- Levy of graded scale of parking fee representing truly the value of the land occupied;
- Development of efficient accessibility to parking lots;
- Encourage to go in for electronic metering for better realization of parking fee;
- Development of underground parking in green areas (considering the social acceptance of the people);
- Encouraging people to use public transport to reach city centre(s);
- Development of parking lots on PPP format for reducing burden on public funds

The Master Plan asserts that a comprehensive parking policy for the area shall be prepared separately taking into account all aspects including existing and potential parking demand, institutional measures and implementation mechanism.

5.8 AREAS WITH MAJOR CONGESTION AND PARKING ISSUES

It has been observed from traffic Survey that the area of Barkura Chowk, Hari Mandir Chowk, Jain High School Chowk, Jilikoni Chowk, Kalpana Studio Chowk, Masjid Chowk, Nagar Chowk, Thana Chowk have been facing major congestion and parking issues specially during peak hours.

Masjid Chowk

Hari Mandir Chowk

Nagara Chowk

Thana Chowk

Figure 5-1: Photos of major Chowk in Nalbari Town

5.9 IMPROVEMENT OF ROTARY AND JUNCTIONS

The transport system plan includes improvement of Rotary and Junctions geometrics including provision of acceleration/deceleration lanes, traffic signs, lighting etc and provision of appropriate traffic control systems. In all only one intersection is recommended for grade separation during the plan period. However, 13 junctions are identified for improvement. It is recommended that all the major intersections, especially those on the arterial and sub-arterials be signalized and in the next level of improvement be linked and integrated and brought under a central Area Traffic Control scheme (ATCs). Grade Separators/Flyovers may be built based on traffic intensity, site conditions and environmental impact assessment (EIA).

Table 5-6 Major Intersections

Sl. No	Major Intersections
i.	Chowk Bazar
ii.	Ambedkar Chowk infront of Police Station
iii.	NT Road (from Masjid Chowk to Bharatia Cinema hall)
iv.	Gurdon High School
v.	Gopal Bazar near Tinkonia Pond
vi.	PNC Road (From Bata Chowk upto Police Station)

vii.	Charminar Chowk
viii.	College Chowk
ix.	Jain School Chowk
x.	Nagara Chowk (Baruah Road)
xi.	Satra MV School Chowk
xii.	Infornt of Premoda Hotel
xiii.	Barkura Chowk

5.10 STREET LIGHTNING AND PROPOSED IMPROVEMENT PLAN

Power supply in the Nalbari town is very pitiable. The infrastructure like LT poles, conductors and transmission lines seem to be decades old. A threat to life and property lures always in the old areas of Nalbari town in particular. The power supply in the town is very erratic and a frequent curtailment has become the routine. There is a tremendous demand for street lighting in Nalbari.

The Town street lighting in Nalbari has been designed, operated or maintained very efficiently in future, which result in the energy consumption. It is proposed to have Energy efficient street lighting in the Town and the Continuity of street lighting for carriageway and pavements for safety purpose. The distance between poles should not be more than 30 meters.

5.11 SIGNAGE AVILABILITYAND REQUIREMENTS

5.11.1 *Lane Markings and Signage*

Generally no Lane Markings and Signage has been observed throughout the Town. Traffic signals, signs and pavement markings are used for traffic control for that

- All on-street parking spaces need to be clearly defined by lane markings.
- Adequate and appropriate signage's to be installed at all places on the street network to identify 'parking' and 'no parking' areas.
- Off-street parking places to be clearly identified by signs and distinguishing marks.

5.12 MAJOR PROPOSALS TO BE ON MAP INDICATING WIDTH OF ROAD AND RESERVATION OF LAND FOR THE PROPOSED ROAD OR WIDENING OF EXISITNG ROAD.

The Revised Nalbari MP-2041 recommends development of a hierarchy based arterial road network system comprising primary arterial, sub-arterial and collector roads. The main functional roads recommended are:

Base on the recommendation of the Advisory Committee, Comprehensive Mobility Plan (CMP) and subsequent DPRs may be prepared for up gradation of transport sector.

5.12.1 *Proposed Transport Development Strategy*

To improve the overall mobility in the region, the following policy imperative need to be taken by the authorities:

i. Provision of efficient, reliable and accessible mass transportation system.

ii. Integration of various mode of transport by way of evolving an integrated multimodal transport system.
iii. Improvement in traffic management through short-term, medium and long-term interventions.
iv. Encouraging public transport and non-motorized modes of traffic.
v. Provision of environment friendly transport systems within the region.
vi. Removal of traffic conflicts by way of grade segregation, provision of missing links, closure of avoidable junctions/cuts etc.
vii. Development of regional corridors for Bye-Passing the regional traffic. Creating important transport nodes along the regional corridors for hassle free movement intercity traffic.
viii. Development of adequate parking facilities across city and removal of Road-side encroachments.
ix. Removal of traffic bottlenecks as a short-term measure.

5.12.2 *Proposed Transportation Network of Master Plan area*

The proposed land use under this category is around 38.20 sq. km which is about 5.86% of the total MP Area. The area in this category under roads is about 32.38 sq. km (4.97%) while that under railways is around 1.10 sq. km (0.17%).

5.12.3 *Proposed Traffic Circulation Plan for City Core*

Areas along the NT Road Road, PNC Road, Hajo Road and Barama Road within the Nalbari Municipal Board area are important commercial areas and witness high degree of traffic congestion mainly because of parking spill-over on main commercial arterials. In order to make this area more accessible and reduce inconvenience caused by parking, a traffic circulation plan has been prepared which includes various traffic system management schemes such as one way streets, pedestrian trail, pedestrian only streets, no parking Roads, provision of automatic multilevel parking and multi-purpose vehicle stand.

- **One way Streets:** Owing to large scale built up areas in Nalbari Town, widening of Roads is not possible at all places. Therefore, Road capacity can be enhanced by adopting low cost traffic circulation measures i.e. one way street.
- **PNC Road Area:** It is proposed to enforce one way traffic movement for all modes on Roads near PNC Road Area.

5.12.4 *Proposed Widening and Functional Hierarchy of Roads*

There are five main radial Roads entering the Nalbari from different directions viz Guwahati Hajo Nalbari Road, Barpeta Nalbari Road, Barama Nalbari Road Connecting NH31, Dhamdhama Road Connecting NH31 and Nalbari Main Road Connecting NH31 bringing the entire regional traffic to the heart of the city.

Most of the radials suffer from congestion because of their over utilization of their limited ROW ranging from 8m to 24m. In addition, the limited carriageway, inefficiency of the junctions and their incapability to handle the volumes of traffic further reduces the capacity of the Road systems.

Accordingly, it was found necessary that some critical junctions and quite a few important Roads will require improvements to cater to projected Road traffic up to the year 2041. Some of the critical junctions where normal signaling cannot effectively manage the traffic volumes, grade separators (Flyover/Underpass) are proposed. The following are the intersections requiring grade separators in Nalbari Town:

Table 5-7: Construction of New Bridges and Widening of Existing Bridges

Sl. No	Location	Type
1	Barkura Railway Crossing	Rail Over Bridge
2	Hari Mandir Crossing	Rail Over Bridge
3	Sonpur Crossing	Rail Over Bridge
4	Durga Mandir Railway Crossing, Near Batahghila	Rail Over Bridge
5	Sandha Railway Crossing	Rail Over Bridge
6	Goghrapar Railway Crossing	Rail Over Bridge

6. INFRASTRUCTURE, PUBLIC UTILITIES & SERVICES

6.1 PHYSICAL INFRASTRUCTURE

The urban service profile refers to the current state of infrastructure and utility systems in the city. It indicates the adequacy or inadequacy of infrastructure services in terms of coverage, quantity, and quality, and attempts to identify the factors responsible for inadequate development of infrastructure services. It measures the gap between demand and supply of different infrastructure services, and examines the factors that explain the gap.

6.1.1 *Water supply*

The Public Health Engineering Department, Government of Assam had taken up a scheme to supply potable water to the residents of Nalbari in the year 1983. At present only a few families are getting the supplied water and rests are depending on own sources like tube well, ring well, tank etc. The maintenance and other works of the water supply scheme was handed to Nalbari Municipal Board soon after its completion. The source of the supplied water is ground water. The ground water at Nalbari contains large amount of iron and the treatment done by the P.H.E. Department is not upto standard.

6.1.1.1 Present Water Supply Status

Main source of water is Hand pump. Assam Urban Water Supply and Sewerage Board also provides drinking water in the town but due to technical problems, the supply is not very steady. At present, the capacity of the water supply scheme for Nalbari town under AUWSSB is 3.9 MLD.

Presently only 30% of the Nalbari town area is covered under piped water supply. The present requirement of water (@ 135 lpcd) for a population size of 27839 would be about 3.7 MLD. The actual supply of water is below the installed capacity. The treatment and storage of potable water is done through overhead tanks located near Gandhi Park, Balilesha Road; Mallapara; and Goru Bazar, Dol Gobindapur.

6.1.1.2 Per capita water supply:

Around 80% of the population of Nalbari receives water at the rate of 90 lpcd which is 45lpcd and 60lpcd less as compared to desired service level benchmark of 135 lpcd of MoUD and 150lpcd requirement of URDPFI guidelines respectively.

Table 6-1Main Source of Drinking Water in Municipality

Area	Tapwater from treated source	Tapwater from un-treated source	Covered well	Un-covered well	Handpump	Tubewell/ Borehole	Spring	River/Canal	Tank/Pond/ Lake	Other sources	Total
Municipality	29.03	0.79	0.18	0.18	65.45	3.39	0.03	0.03	0.04	0.86	100%
Outside Municipal Boundary (inside MP Area)	2.23	0.36	0.46	0.21	95.19	0.43	0.01	0.23	0.14	0.74	100%

Source: District Census Handbook, Census of India 2011

6.1.1.3 Water Demand Estimation for Resident in Nalbari MP Area

As per the water supply demand calculation, the existing water supply demand is 41 MLD, whereas the demand will increase to85 MLD by 2031 and 313 MLD in 2041.

Table 6-26Water Demand Estimation for Resident in Nalbari MP Area

Description	2021	2031	2041
Total Population of Nalbari Master Plan Area	228536	479245	17,93,091
Projected Water Demand (MLD)			
Total Water Demand @ 135 LPCD	31	65	242
15 % O & M loss	4.7	9.8	36
Sub Total	35.7	74.8	278
2% Fire Fighting	0.72	1.50	5.6
Total Water Demand	36.42	76.30	283.60
Grand Total Water Demand (Say)	**37**	**77**	**284**
Add 10% extra (Say for defense area, Floating population, Tourism, Service population etc.)	4	8	29
Overhead Population Water Demand	**41**	**85**	**313**

Note : *Cities provided with piped water supply where sewerage system is existing / contemplated- 135 lpcd (URDPFI Guidelines)*

To sum up, the total water demand **by 2041** in the Revised Nalbari Master Plan-2041 is estimated at around **313 MLD.**

6.1.2 *Drainage System*

At present, there is no such scientific and well defined storm drainage system at Nalbari town, worth the name; only a few kutcha unlined road-side drains are there to drain out the surface rain water as well as the storm waste to the nearby lowlying areas. Most of the drains remain soaked throughout the year. Consequently water logging is a common issue in the vicinity. With the increase of population and built-up areas, the natural low-lying areas and natural water courses have also been filled up. Of course the silting problem is also a vital factor.

The existing drainage network of Nalbari town is mostly earthen in nature and is in need of improvement. Main market area and some residential areas have RCC drains but due to lack of the total network, these drains get clogged due to blockage in the earthen drains. The town does not have a sewerage system and most of the treatment is through septic tank. Effluent from the septic tanks is directly discharged into roadside drains.

The Action Plan shall be chalked out for the extension, augmentation and rehabilitation of existing drainage system in a comprehensive manner. Keeping the geo-climatic factors in view, it would be more feasible to develop a segregated drainage system under the Revised Nalbari Master Plan-2041 to avoid seasonal load on the sewerage system as proposed above. To benefit from GOI schemes, the concerned department shall get a DPR prepared immediately after the approval of this Master Plan so that the projects/schemes identified in the DPR are funded under the CSS.

6.1.3 *Sanitation*

Under "Swachh Bharat Mission – Gramin (SBM – G)", 69,580 nos. of sanitary toilet have been constructed in the District based on "Base Line Survey- 2012 (BLS – 2012)". The district has consequently been recognized as "Open Defecation Free (ODF)" District on 15th August, 2017, for which special recognition has been conferred to PHED Nalbari by the Hon'ble Chief Minister of Assam.

For conversion of dysfunctional toilets, 9466 nos. of toilet have been sanctioned by Government under "Swachh Bharat Kosh (SBK)" and constructions of these toilets are now going on full swing.

2502 nos. of Toilets are sanctioned against the eligible beneficiaries of "Left Over Base Line Survey – 2012 (LoB – 2012)" and construction of these toilets are now going on.26 nos. of "Community Sanitary Complex (CSC)" have so far been constructed.

6.1.4 *Sewerage Network*

Presently the Nalbari MB does not have any integrated sewerage system. There are generally septic tanks in the municipal boundary. The effluent is released untreated into the nearby drains and low-lying areas. Similar is the case of industrial wastewater. In case of septic tanks, the soak pits are becoming non-functional in many areas because of high sub-soil water table within a short span of time. The encroachments on existing natural drainage system, which is the main reason for the blockage, should be stopped.

There should be a separate DPR for the Sewerage network for the town and the sewerage flow has been calculated assuming 80% of the total water demand with 5% of this as infiltration.

It is strongly recommended that PHED and city drainage divisions shall prepare a DPR for the entire area of Revised Nalbari Master Plan-2041 after the approval of the Master Plan.

6.1.5 *Solid Waste Management*

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

The production of solid waste is considered as an important function of the socioeconomic profile of the population and activities in urban area. According to URDPFI Guidelines, the generating of waste varies from about over a quarter kilogram in small town to about half a kilogram per capita in large and metro cities.

Nalbari which falls in the category of medium cities, the waste generation will be ¼ of kilograms per capita per day. This implies that total waste generation in Nalbari master plan area by 2041 would be around 448.5 Metric Tons per day

As there is no garbage dumping points in the Nalbari Municipal Area. The garbage collected by Municipality are dumped in now lying areas within the town whichcreates nuisance and health problems. It is therefore recommended that the municipal authority looks for proper landfill sites and then in collaboration with the town and country planning dept., a suitable sustainable plan is further prepared to serve the present and the future needs of the area.

6.1.6 *Electric sub-station and major transformers*

The power requirement for the town is - Domestic consumption is about 52.1% of the total power supply against 35.0% commercial consumption and 12.9% industrial consumption Nalbari town has a electrical sub-station of 10- MVA capacity.

Table 6-3 Electric sub-station and major transformers

Electricity-Domestic Connection (Numbers)	Electricity-Industrial Connection (Numbers)	Electricity-Commercial Connection (Numbers)	Electricity-Road Lighting Connection (Numbers)	Electricity-Others Connection (Numbers)
5630	90	1100	900	512

Source: District Census Handbook, Census of India 2011

For the plan period of 2041, the city would require about 1195 MW power supply for domestic purposes @ 3-4 kw per household and about 1000 MW @1-3 kw for each commercial establishments, industrial units, street lighting etc.

According to URDPFI Guidelines and based on the estimated requirements of power supply as per the Master Plan of Delhi, the average consumption works out to 2 KV per household at the city level and includes domestic, commercial, industrial and other requirements. One electric substation of 11 KV switching station for a population of 15,000 is recommended.

6.2 SOCIAL INFRASTRUCTURE

Compared to other cities of Assam State, Nalbari has the maximum concentration of community facilities and services viz. educational, health, cultural and recreational facilities which cater not only to the local demand but also the demand of the entire Nalbari region. Availability of social facilities is a key for quality urban living. Social infrastructure involves much more than the provision of core public services such as schools and hospitals. It includes provision and delivery of facilities and services necessary for a community to develop facilities pertaining to Health, Education, Sports facilities, Socio-cultural activities, Recreation, etc.

6.2.1 *Education*

In Nalbari there are about 78 number of educational institutions ranging from Primary School to College level with student population of about 19,383.

The Master Plan envisages the establishment of integrated schools in new areas rather than opting for various levels of educational institutional facilities separately. Similarly, crèches and pre-nursery schools are permissible in the residential use as a part of the Mixed use Policy. In all educational institutions, proper provision for differently abled children shall be made.

6.2.2 *Health*

Health facilities are very important for the well-being of people. A number of hospitals and dispensaries have been added both in the Government and private sector to extend medical facilities and in order to preserve and promote the health standard of people in the city. The age expectancy has reached the level of 65-70 years. With the increase of population, influx of migration from Valley and development of posh localities in the city, many private medical institutions have come up. There is one level Government hospital and a privately operated maternity hospital besides two others private nursing homes.

Source: Health & Family welfare website

Table 6-4 Numbers of Health Institutions in Nalbari District

Civil Hospital	1
Block Public Health Centre	4
Mini Public Health Centre	34
Community Health Centre	7
State Dispensaries	5
Subsidiary Health Centre	4
Health Sub Centre	121
Anganwadi Centre	1510
Model Hospital	2

Source: Nalbari.gov.in website

During last couple of years, the health sector in the district has seen tremendous progress. It was the advent of the Dist. Health Society, (NRHM) Nalbari in 2005 that set the ball of progress rolling. The improvement was seen in all sections of health department in terms of infrastructure, manpower, service delivery, awareness and so on and so forth.

6.2.3 *Recreational Facilities:*

At present, there are number of facilities such as playgrounds, Parks, Sports clubs, library etc. within the Nalbari city limits. As the city is expanding the need for recreational facility would be in high demand so more number of such services shall be made available which can serve well within the city limits. Looking at the expansion of the city, the locations for new recreational facilities shall be rationally located within the city limit as per the URDPFI standards.

6.2.3.1 Parks:

In fact there are no organized parks in Nalbari town. Though there are four Nos. of parks namely, - Gandhi Park, Swahid Park, J. N. Dutta Barua Park and P.N.C. Municipal Park with areas of 8 Kathas 14 Lessas; 1 Katha 4 Lessa; 7 Bighas 2 Kathas 1 Lessa and 0.03 Hectare respectively. J. N. Dutta Baruah Park and P.N.C. Municipal Park, in the heart of the town, cannot be regarded as a park at all. Gandhi Park at Malikuchi which occupies an area of about 7 Bighas of land has a scope to develop as a full-fledged park with a fishery for angling and children playing facilities.

6.2.3.2 Play Ground:

The public field which is in front of old Gurdan School may be regarded as the only public field and open space. This public field serves as public gathering as well as playground. There is no organized play ground in Nalbari town. The playgrounds which belong to the educational institutions namely Gordan H.S. School, Nalbari College and Deviram Pathsala H.S. School are not up to standard. It is therefore proposed to set up a proper playground in the town with standard amenities which can be used to accommodate people in a hassle-free way during social and political gatherings.

6.2.4 *Communication Services and other Facilities*

6.2.4.1 Police Station

Presently, there is 1 Police Stations, 1 police reserve & 1 District jail in Nalbari.

A no. of Provision of police out posts needs to be incorporated at each of the villages added under the main police station for a regulated and crime free area.

According to URDPFI guidelines, one Police Station shall be there for serving 90,000 populations.

6.2.4.2 Fire Service

Fire Services are needed for protecting people from fire hazards, building collapses, and other unforeseen emergencies. There is only one Fire Protection Service for the entire Nalbari Master Plan Area and it is located at old N.T. Road

Now that the planning area has increased, a need for further 2 fire sub-station within the planning area needs to be accommodated.

Preparation of Fire Hazard Response Mitigation Plan (FHRMP) need to be carried out by concerned Dept. & Integration of FHRMP with 15thFinance Commission report and state five year plans for mobilisation of funds.

6.2.4.3 Postal Services

The town has a 1 Head post office. Nalbari dakghar offers all the postal services like delivery of mails & parcels, money transfer, banking, insurance and retail services. It also provides other services including passport applications, P.O. Box distribution, and other delivery services in Nalbari. Few Courier services has come up recently in the town and trending at a large pace. There are other 2 Nos. of Sub-Office in Nalbari Town viz. Khatabari & Bidyapur.

According to URDPFI guidelines, one post office is to be provided for 5,000 populations.

6.2.4.4 Bank

The town has a total no. of 27 Nationalized. Banks and a no. of sub branches are established in different location at Nalbari.

6.2.4.5 Telecommunication

Nalbari also boasts of an excellent mobile phone, WLL and broadband internet connectivity provided by a number of national telecom giants.

6.2.4.6 Distributive facilities

Distributive Facilities include Milk Distribution, LPG Storage and Distribution and Petrol Pumps.

Table 6-5Planning Norms and Standards for Distributive Facilities

S.No.	Category	Planning Norms and Standards
i.	Milk Booth/Milk and Fruit and Vegetable Booth	One per 5,000 population (in residential developments)
ii.	LPG Godown including Booking Office.	1 LPG Godowns to serve 40,000-50,000 populations
iii.	Petrol Pumps	As per URDPFI Guidelines

6.2.4.7 Cremation and Burial Grounds

The entire Nalbari Master Plan Area has only one, cremation ground located at Garu Bazar area and three burial ground at Malikuchi, Khatabari and Moullapara.

Table 6-6Norms for Cremation/ Burial Ground as per URDPFI Guidelines

Sl. No	Category	Population Served per unit	Min. Land Area requirement
i.	Electric Crematorium	1 for large size towns	2.00 Ha
ii.	Cremation Ground	5 lakh	2.50 Ha
iii.	Burial Ground	5 lakh	4.00 Ha

6.2.4.8 Cinema and Theatres:

There is only one Cinema Hall in Nalbari which has to serve the population of whole the entire district. The seat capacity of the Cinema Hall is 750 Nos. and covers an area of 1 Bigha 1 Katha. The only Theatre Hall called Nalbari Natya Mandir is located at the heart of the town with 450 Nos. of seat is not at all standardized. Again more often Cinema is showing in the Theatre Hall under the name 'Ananda Takies'.

These two Halls have to serve the population of Nalbari town as well as the population of almost the entire district. The newly developed colonies in the peripheral localities of the city also need recreational facilities.

6.3 PROVISION FOR PHYSICALLY CHALLENGED PERSONS IN THE PUBLIC BUILDINGS:

6.3.1 *Scope*

These bye-laws are applicable to public buildings and exclude domestic buildings. Buildings which shall provide access to ambulant and non-ambulant physically challenged persons are listed below. Distinction is made for buildings to be designed for the use of large wheel chairs and small wheel chair.

6.3.2 *Buildings to be designed for Ambulant Physically Challenged People (Besides Hospitals)*

Higher Secondary School, Conference Hall, Dance Halls, Youth centres, Youth clubs, Sports centres, Sports pavilion, Boat club houses, Ice/roller skating rinks, Swimming pools, Police stations, Law courts, Court houses, Sports stadiums, Theatres, Concert halls, Cinemas, Auditoriums, Small offices (the maximum plinth area 1400 sq.mt.), Snack bars, Cafes and Banqueting rooms (for capacity above 50 dinners).

Note:

- In sport stadiums provisions shall be made for non-ambulant spectators (small wheel chair) @ 1:1000 up to 10,000 spectators and additional 1:2000 for spectators above 10,000.
- In Theatres, Concert halls, Cinemas and Auditorium provisions shall be made for non-ambulant spectators (small wheel chairs) @ 1/250 up to 1000 spectators and additional 1/500 for spectators above 1000.

6.3.3 *Buildings to be designed for Non-Ambulant Physically Challenged People*

Schools for physically challenged persons, cremation grounds, public/semi-public buildings, Botanical gardens, Religious buildings, Old people clubs, Village halls, Day centres, Junior training centres, post offices, Banks, Dispensaries, Railway stations, Shops, Super markets, and Departmental stores.

Note:

- Large wheel chair criteria shall be applicable on ground floors of the following buildings:
- Post offices, Banks, Dispensaries, Railway station, Shops, Super markets and Departmental stores.

6.3.4 *Building to be designed for Non-Ambulant Physically Challenged Persons (using small wheel chairs)*

Public lavatories in Tourist spots, Club motels, Professional and Scientific institutions, Museum, Art galleries, Public libraries, Laboratories, Universities, College for further Education, Teachers Training Colleges, Technical College, Exhibition halls, Dentist surgeries, Administrative department of the Hospitals, Service stations, Car parking, Building airports terminals, Bus terminals, Factories employing handicapped for sedentary works, large offices (with plinth area above 400 sq.mt.), Tax offices, Passport offices, Pension offices, Labour offices, Cafes, Banqueting rooms and Snack bars (for capacity above 100 dinners).

6.3.5 *Building Requirements*

The following building requirements are to be provided for buildings mentioned above:-

6.3.5.1 Site Planning:

- Access path from plot entry and surface parking for building to building entrance shall be minimum of 1800 mm wide having regular surface without any steps.
- The parking of vehicles of disable people @ two equivalent car spaces (ECS) shall be provided near entrance of 30 mt. from building entrance.

6.3.5.2 Approach to Plinth Level:

- Ramp shall be provided to enter the building; minimum width of ramp shall be 1800 mm with maximum gradient of 1:12 length of ramp shall not exceed 9.0 mt. having 90 mm high hand rail on both sides extending 300 mt. on both sides of ramps. Minimum gap from the adjacent wall to the handrail shall be 50 mm.
- Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 x 2000 mm.
- Minimum clear opening for the entrance door shall be 1000 mm. Threshold shall not be raised more than 12 mm.
- For stepped approach size of tread shall not be less than 275 mm and maximum riser shall be 150 mm.

6.3.5.3 Stairways:

- Height of the riser shall not be more than 150 mm and width of the tread not less than 275 mm, nosing if provided shall not extend beyond 25 mm. Maximum number of risers on a flight shall be limited to 12.

6.3.5.4 Lifts:

- Whenever lift is required as per bye-laws, provision of at least one lift will be made for non-ambulant disabled (using small wheel chairs with the following dimensions of lift).
- Clear internal depth : 1090 mt.
- Clear internal width : 1750 mt.
- Entrance door width : 910 mt.
- A handrail not less 600 mm long at 1000 mm above floor level shall be fixed adjacent to the control panel.

6.3.5.5 Toilets:

- One special W.C. in a set of toilet shall be provided for the use of physically challenged persons. No additional provision of W.C. is to be made for physically challenged persons.
- Size of the W.C. shall depend on the category of physically challenged persons for whom it has been provided.
- All doors in W.Cs shall open outside.
- The type of W.C. shall be European with seat height as 500 mm.
- Handrails, where provided shall have min 25 mm dia.

6.3.5.6 Provision of W.Cs in building without lift:

- Provision of special W.C. shall be made on all floors for buildings designed for ambulant physically challenged persons.
- For buildings designed for non-ambulant physically challenged persons special W.C. shall be provided at Ground floor. Size of W.C. shall depend on the type of wheel chair used by the disabled.

6.3.5.7 Provision of W.Cs in building with lift:

- Provision of special W.C. shall be made on all floors. Size will depend on the category of physically challenged persons for whom it has been provided.

6.3.5.8 Toilet Details:

- For Toilets Designed for Ambulant Physically Challenged Persons:
- The minimum size of W.C. shall be 1075 x 1650 mm with a minimum size of 1450 mm for entry door 900 mm. Long handrail on the side closer to W.C. width between the handrails shall be 90 mm and height of handrails shall be from floor level.
- Minimum size of the clear door opening shall be 780 mm.
-
- For Toilets Designed for Non-Ambulant Physically Challenged People (using Small Wheel Chair):
- The minimum size of W.C. shall be 1350 x 1500 mm with a minimum depth of 1500 mm for entry door. 900 mm long handrail on the side closer to W.C. shall be fixed towards one side to the opposite adjacent wall. The centerline of W.C. adjacent wall shall be 400 mm and minimum 950 mm from the other wall.
- Minimum size of the clear door opening shall be 780 mm.
-
- For Toilets Designed for Non-Ambulant Physically Challenged Persons (using Large Wheel Chair):
- The minimum size of W.C. shall be 1500 x 1750 mm with a minimum depth of 1750 mm for entry door. 90 mm long handrail on the side wall closer to W.C. shall be provided. To provide movement space for wheel chair, W.C. seat shall be fixed towards one side of the opposite wall. The centre line of the W.C. from the adjacent wall shall be 400 mm and a minimum of 1100 mm from the other wall.
- Minimum size of the clear door opening shall be 860 mm.

7. ENVIRONMENT AND CITY BEAUTIFICATION PLAN

7.1 INTRODUCTION

Although Nalbari town has a few hectares of eco-sensitive area like river banks and embankments, and some farm lands and open grounds, very few developed parks and playgrounds are available. Based on existing land use survey, presently only about 10 ha area is under recreational land-use.

For the purpose of creating a sustainable environment, the Revised Master Plan proposes preservation of natural endowment elements. In view of the projections made in this master plan, Nalbari Town would require more infrastructure, amenities and other facilities at special scale which would generate enormous pressure on its environment. Below are the set of proposals and recommendations grouped by various issues to address; air quality, water quality, noise level, visual quality, eco-sensitive areas, heat, energy efficiency and climate change.

The main drawback for not being able to locate a specific area is for all being private lands. So if the space cannot be acquired for the purpose for some reasons, this way keeps flexibility.

For the purpose of creating a sustainable environment, the Revised Master Plan proposes preservation of natural endowment elements. Conservation of heritage sites shall include buildings, artefacts, structures, areas and precincts of historic, aesthetic, architectural, cultural or environmentally significant nature (heritage buildings and heritage precincts), natural feature areas of environmental significance or sites of scenic beauty.

7.2 PLAN/MEASURES FOR PROTECTION AND CONSERVATION OF ENVIRONMENTALLY-FRIENDLY ZONES

The various initiatives taken up by the GoI and GoA towards biodiversity conservation and improvement are mentioned below: In view of the projections made in this master plan, Nalbari Town would require more infrastructure, amenities and other facilities at special scale which would generate enormous pressure on its environment.

7.2.1 *Issues pertaining to urban environment in Nalbari*

The issues pertaining to urban environment in Nalbari are largely to do with the poor quality of life due to the poor access to basic services than with impacts associated with environmental impacts on ecologically significant or protected areas.

- Nalbari Revised Master Plan Area has an Industrial Estate under District Industries and Commerce Centre (DICC). All the industries placed within the industrial estate have taken measures to control air pollution.Since Nalbari is rapidly growing in terms of Real Estate and road network, dust from building materials is one of the major Air polluting factor.
- The major cause for pollution of land and water in Nalbari is the lack of an underground sewerage system, and an efficient solid waste collection and management system. In the absence of these, the natural streams and drains are the recipients of wastes leading to degraded quality of life in most of the localities within Master Plan Area.
- The levels of noise have been constantly increasing due to the increase in the vehicles on the road and other Incompatible land uses, for example party plots located in residential areas, malls or market places.
- Due to the hard and reflective surfaces in urbanized area, heat effect can be seen through the climate change in the Nalbari.

7.2.2 *STRATEGIES FOR IMPROVEMENT OF URBAN ENVIRONMENT*

Based on the identified issues strategies have been formulated to improve urban environ quality of the city. Table 7-1 identifies the strategies to be taken and the likely projects as part of these strategies to improve environmental health of the city.

Table 7-1: Strategies and projects to improve environmental health of the city

Sl. No.	Sector	Issues	Strategies for environment improvement	Projects
1	Air	Degraded air quality		Infrastructure development in the northern portion of the master plan area to decongest the existing areas
		Congestion within the city		Tree plantation along roads and intersection
		Poor traffic management		Alternative road alignments to decongest roads
		Increased SPM levels		Widening/up gradation of roads
2	Water	Degraded water quality	Promotion of rain water harvesting	Afforestation programs along nallahs
			Restoration of catchment areas of natural water bodies and nallahs	
		Contamination of piped water with sewerage	Upgrading /improving infrastructure	Incorporation of rain water harvesting in building bylaws Replacement of water pipelines
		UFW	Measures to check UFW losses	Consumer and bulk water metering to be installed
3	Sewerage and sanitation	No sewer network	Upgrading /repairing sewerage infrastructure of the city	Provision of sewerage infrastructure of city
		Lack of sanitation facilities in Town area		Development of sanitation facilities especially in the poor income areas
4	Drainage	Vulnerability to landslides and erosion	Protection measures to improve the situation	Construction of landslip protection measures
				Provision of sewerage systems and improvement of waste collection systems
				Afforestation measures and buffer plantations
				Drainage improvement works
5	SWM	Indiscriminate dumping of garbage	Upgrade SWM infrastructure and facilities	Sanitary landfill sites for city
		Land Pollution by leachate		Purchase of waste collection trucks and dustbins
		Spread of vector, diseases		Public awareness and education campaigns
				Build transfer stations
				Compost plant
6	Green cover and Open spaces	Loss of green cover and open spaces	Undertake plantation programs to Increase green cover of city	Plan for green belts and spaces in master plan
		Absence of recreation spaces		Development of parks and open spaces
				Urban forestry and plantation schemes for city

Sl. No	Sector	Issues	Strategies for environment improvement	Projects
				Remove encroachments from open spaces in walled city
7	Urban Poverty	Katcha Houses and poor sanitation conditions	Improve housing and infrastructure conditions in all Katcha houses	Physical infrastructure upgradation programs
		Environmental degradation due to poor living conditions		Community toilets in areas
				Low cost housing

7.3 CITY BEAUTIFICATION PLAN/PROPOSALS

7.3.1 *Roadside plantation*

One of the best example of planned tree plantation along city roads in India is New Delhi. It is an exemplary model of architectural, structural and aesthetic excellence. Some of the remarkable features that can be attributed to its artistry are:

- Use of structurally large trees with very tall, straight trunks that form excellent sprawling crowns.
- The use of indigenous species that are hardy, sturdy and durable that makes them easy to grow and maintain. They are able to withstand the extreme environmental pollution from toxic automobile exhausts that usually threaten delicate trees.
- Evergreen varieties of trees used which lends to year-round green effect and protection from severe weather conditions.
- The entire expanse of open space between the concrete buildings and roads covered, creating a soothing visual effect.
- Avenues planted with single kind of trees that offers a glorious collective impact. The consistency, homogeneity of structure, texture and pattern it creates has helped bind the entire city together.
- Trees planted in straight rows and geometric patterns help create a beautiful effect in a city the magnitude of Delhi.
- Planting trees close to the verges, has helped separate vehicular and pedestrian traffic.
- All flowering species of trees that are structurally small, short-lived and difficult to grow and maintain have deliberately not been used for roadside plantation. Instead these have been exclusively planted in parks and various open spaces where they grow well and provide colour and beauty to the city.

Benefits of road side planting

- Reduced soil erosion: holds soils in place
- Remove dust and other pollutants from the air, protecting crops and road-side communitiesWind break.
- Flood control: slow and absorb road run-off
- Carbon dioxide sequestration
- Provide important pollinator habitat (honey production)
- Provide shade and keep the road cool for road users
- Beautification

7.3.2 *Urban Agriculture and Urban Forestry*

7.3.2.1 Urban Agriculture

Urban agriculture can be described as the growing of plants and the rearing of animals primarily for food and other domestic use within a city or a town and its environs. It also involves activities such as the production, processing, marketing, and delivery of farming products. Urban agriculture consists of a number of production systems. They vary from domestic production and household level processing to large scale agriculture. This is usually done within the city peripherals.

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Types of Urban Agriculture	• Backyard Gardens • Tactical Gardens • Street landscaping • Forest gardening • Greenhouses • Rooftop gardens • Green walls • Vertical farms • Animal husbandry • Urban beekeeping • Aquaponics
Benefits of Urban Agriculture	• Economic benefits • Environmental benefits • Social and cultural benefits • Education, skill-building, and job training benefits • Health, Nutrition and Food Accessibility Benefits

7.3.2.2 Urban Forestry

Urban forestry or *Nagar Van* (Urban Forests) can be defined as the raising and management of trees in and around urban areas. Urban forestry is the art, science and technology of managing trees and forest resources in and around urban community ecosystems for sociological, economic and aesthetic benefits that trees provide for society.

Urban forests will work as lungs of the cities and will primarily be on the forest land in the City or any other vacant land offered by local urban local bodies.

India has 8% of world biodiversity with only 2.5% of world land mass. It should also carry 16% of humans and cattle as well. Also, the fresh water availability in the second most populous country in the world is just 4%.

7.3.3 *Public Rain Water Harvesting Scheme*

Depending upon climatic conditions, topography, hydrogeology of the area, suitable structure for rain water harvesting and artificial recharge to ground water is required. Roof top rainwater harvesting need to be adopted in urban areas as well as in the subordinate village areas and proper scientific intervention for development of groundwater is required in water scarce areas.

The artificial recharge of ground water aims at augmentation of ground water reservoir by modifying the natural movement of surface water utilizing suitable civil construction techniques. Artificial recharging facilitate to enhance the sustainable yield in areas where over-development has depleted the Aquifer. Conservation and storage of excess surface water for future requirements, improving the quality of existing ground water through dilution, removing bacteriological and other impurities from sewage and waste water so that water is suitable for re-use. To facilitate ground water

recharging it is essential to identify availability of non-committed surplus monsoon run off in space and time.

Water harvesting by way of storage of rainwater in all new buildings existing on plots of 1000 sq. mtr. and above, and all group housing shall be mandatory. The plans submitted to the local authority shall indicate the system of storm water drainage along with points of collection of rain water in surface reservoirs or in recharge wells.

7.3.4 *Development of parks and recreational spaces*

Riverfront Development and Conservation of Water bodies

The polluted stretch of Pagladia River is approximately 4 KM in length with an area of 16 sq.km in town area, which is covering the major part of the length and breadth of the town, are proposed to be developed as the leisure valleys of Nalbari. It is proposed that all sources of pollution along these nallahs are to be removed. The nallahs are proposed to be developed as the channels carrying clean water in order to improve the quality of ground water in the town. In addition, the walkways are proposed to be planned along these nallahs besides undertaking the landscaping. Further, the nallahs could also be used for draining the rainwater of the town in order to minimize the problem of water logging in the city. The development of nallahs is to be taken up in the shape of project for the area kept as green.

7.3.5 *Identification and demarcation of multi-purpose open spaces for sports, cultural functions, fairs, circus, etc.*

Two locations are earmarked in the Nalbari Municipal Board area at Ward no 2 in the Office campus of Department of Forest (Urban Forestry) and at ward no 7 in the campus PWD Inspection Bungalow with Area of 0.7 Hectares and 1.1 Hectares as Park. Upgradation of existing open fields and Playgrounds located at Gurdon School ground, Nalbari College Ground and Medical Ground at Ward no. 4, under various Govt. Schemes.

7.3.6 *Beautification of major transit zones (major junctions, Bus depot, Railway Station, market zones, etc)*

Industrial Area Management

In the industrial/residential areas, land should be identified for plantation/green belt development and for each ofthe developmental/industrial schemes; sufficient plantation may be undertaken in all the available spaces. Theplant species should be selected in consultation with the Forest Department. Such areas should not becompounded later on for establishment of industries.

- The industries should preferably be permitted in industrial areas
- Establishment of industries outside the industrial area should be as per the initial environmentexamination (IEE) permitted in case it is not feasible to locate them within the premises of industrial area.
- Suitable site for solid waste dumping should be identified for each of the industrial area
- The provision of combined effluent treatment facilities should form part of infrastructure provided to the
- industries
- The rainwater harvesting measures by the industrial units should be encouraged

7.3.7 *Road signage and street furniture*

Street furniture including benches in areas of high pedestrian traffic and/or areas of interest is very important and the design must take into consideration the local context in terms of weather resistance and material selection.

7.3.8 *Buffer Zones*

For preservation of the streams within the local area, following buffer belts have been proposed as 'No-Construction Zones'. However, following uses are permitted within the buffer zones:

i. Public Utilities like STP, OHT, Electric sub-station, Water Pumping Stations, Utility Network;
ii. Roads, Pathways, Cycle tracks;
iii. Surface Parking;
iv. Parks and jogging tracks;
v. Open to sky jetties for boating, platforms for fishing; and
vi. All such uses which do not involve construction of permanent structures on temporary basis.

7.3.8.1 Proposed Buffer belts:

Pagladia river: 50 meters from the Full Tank Level, however, in case of built up areas; a buffer of 30 meters shall be maintained. At Present the Embankment in the Left bank side is 42.8 km and the Right Bank side is 46.8 km of the river.

Table 7-2Regulating activities in the Flood Plain Zone/Buffer Zones

Sl. No.	Action points	Responsible authority
i.	Plantation in the flood plain zone/Buffer Zones	Forest Department
ii.	Checking Encroachment	Local administration
iii.	Demarcation of the flood plain zone/Buffer Zones	Water Resource Department
iv.	Prohibition of disposal of all kinds of wastes	District Administration

8. LANDUSE PLAN

8.1 EXISTING LANDUSE

The present Nalbari Municipal area is 1354 Hectares against the proposed Nalbari Master Plan area of 12136.97 hectares. comprising of 70 (Seventy) adjoining villages. Low-lying/Marshy Land are present in few pockets across the proposed Master Plan area. Due to lack of land-use control and illegal constructions, these lands have been developing for residential as well as other purposes, which has been a reason for natural drainage to get affected.

8.2 LANDUSE PATTERN

Land use survey was conducted for the Revised Nalbari Master Plan area by Town & Country Planning office, Nalbari.

Table 8-1 Existing Land-use Classification

Sl. No.	Land use	Municipal Area		Total Master Plan Area		
		Area in Hectare	% to Developed Area	Area in Hectare	% To Developed Area	% To Total Area
1	Residential	-	-	5440.35	87.64	44.82
2	Commercial	-	-	33.06	0.53	0.27
3	Industrial	-	-	24.21	0.39	0.20
4	Public & Semi-Public	-	-	139.93	2.25	1.15
5	Transportation	-	-	503.90	8.12	4.15
6	Recreational	-	-	10.94	0.18	0.09
7	Railways	-	-	55.10	0.89	0.45
	Total developed area	-	-	6207.50		51.15
8	Open Spaces	-	-	154.17		1.29
9	Water Bodies	-	-	246.99		2.03
10	Agricultural	-	-	5528.31		45.55
	Total Area			**12136.97**		

Source : Primary Landuse Survey

It is seen from the above table that 5440.35 hectares of land comprises of Residential land-use, which is 87.64% of the total developed area. Commercial and Industrial area covers 0.53% and 0.39% of the total developed area respectively. This indicates that Nalbari is lagging behind in terms of industrial and commercial activities despite being well connected and very close to Guwahati, the biggest commercial centre of the north-eastern part of the country. The existing commercial areas are concentrated along the N.T. Road running south of the railway line and across the junction of the roads leading to Barpeta and Guwahati. This has created congestion in the central area and hindrances in the way of free flow of traffic. Recreational land-use is 0.18% of the total developed area which is way below the recommended percentage of 10-12% in the URDPFI Guidelines, 2014. Public and semi-public land use is 2.25% which is again below the prescribed URDPFI limit of 6-8%

of the total developed area. This points towards a possible inconvenience of the public in seamless access to public services. Transportation and railways comprises 8.12% and 0.89% of the land-use in total developed area respectively. Agricultural land-use is 5528.31 hectares which accounts for 45.55% of the total Master Plan area. Agriculture occupies almost half of the total Nalbari Master Plan land area and shows the heavy reliance of the people here on agriculture.

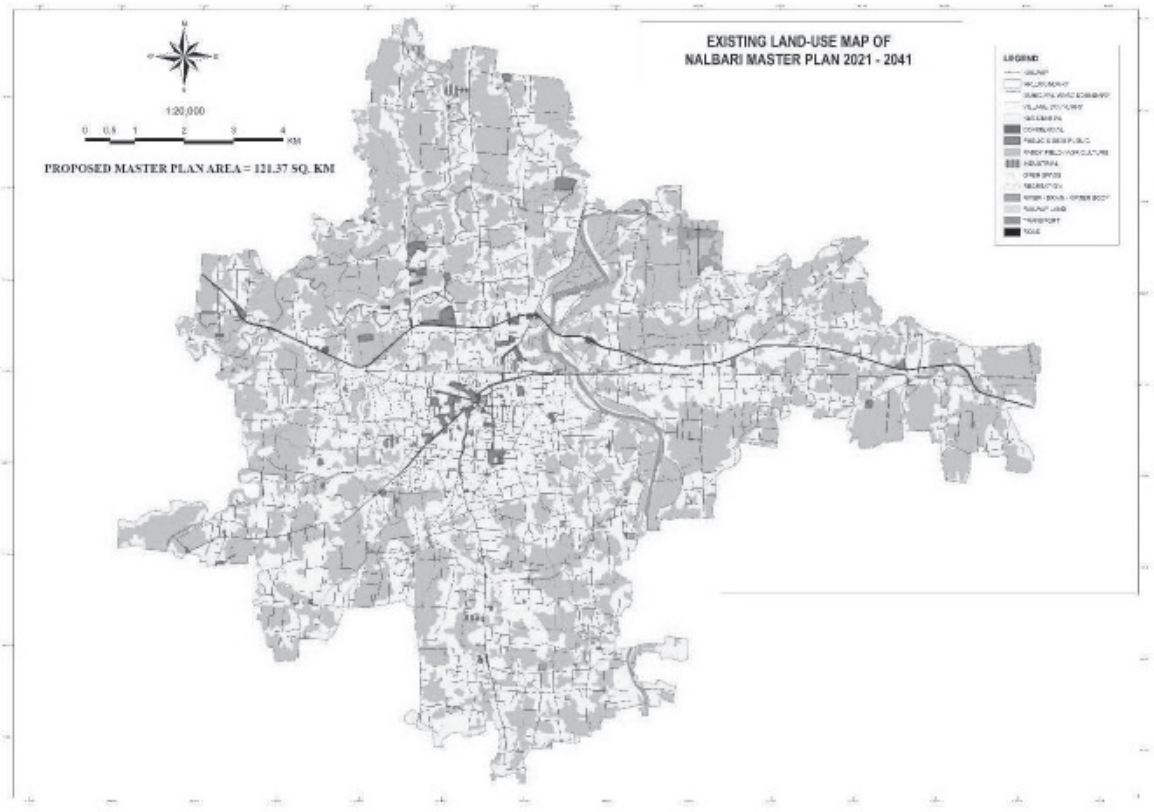


Figure 8-1 Existing Landuse Map of Nalbari Revised Master Plan

8.3 LAND-USE INTERACTIONS

The survey conducted by Town and Country Planning, District Office Nalbari in the year 2017 reveals that the planning area has mixed land-use especially within the Municipal area. This has created inefficient and non-conforming land-use and loss of inter-relationship between various land-use. It is observed that quite a no. of land-use does not have functional relationship with the surrounding area. A few of them cause nuisance in the area where they exist at present. Relocation of such incompatible land-use to suitable site is, therefore desirable.

8.4 PROPOSED LAND USE PLAN

All areas under the Revised Nalbari Master Plan have been designated as one of the 7 land use-zones, which are residential, commercial, industrial, public- and semi-public, recreational, transportation and industrial.

The over-all land use break-up for the new proposed Planning Area measuring 12136.97 hectares. is as follows:

Table 8-2Proposed Land-Use Classification

Sl. No.	Land use	Proposed Municipal Area		Proposed Total Master Plan Area		
		Area in Hectare	% to Developed Area	Area in Hectare	% To Developed Area	% To Total Area
1	Residential	-	-	4800.00	61.07	39.55
2	Commercial	-	-	229.27	2.92	1.89
3	Composite			967.64	12.31	7.97
4	Industrial	-	-	806.75	10.26	6.65
5	Public & Semi-Public	-	-	328.92	4.18	2.71
6	Transportation	-	-	605.45	7.70	4.99
7	Recreational	-	-	69.61	0.89	0.57
8	Railways	-	-	52.08	0.66	0.43
	Total developed area	-	-	**7859.72**		
9	Open Spaces			0.18		0.00
10	Water Bodies	-	-	248.88		2.05
11	Agricultural	-	-	3618.00		29.81
12	Green belt			20.10		0.17
13	Eco-Sensitive Zone			360.00		2.97
14	Dumping Ground			30.27		0.25
	Total Area			12136.97		100.00

- ***Residential Area:***

The residential areas are proposed to be developed as self-contained units with provisions of all community facilities and services, and work places within reasonable distances duly served by efficient circulation system. In order to accommodate the future population, an area of about 4800 hectares, or 61.07% of the total developed area has been earmarked for residential use. Further, a composite zone of 12.31% of the total developed area proposed along the NH 31 may also be used for residential purposes. The proposed residential land-use has surpassed the URDPFI recommendation of 43-48%. However, it is to be noted that in 2011, the decadal growth rate of population in Nalbari Master Plan Area has been over 100%.

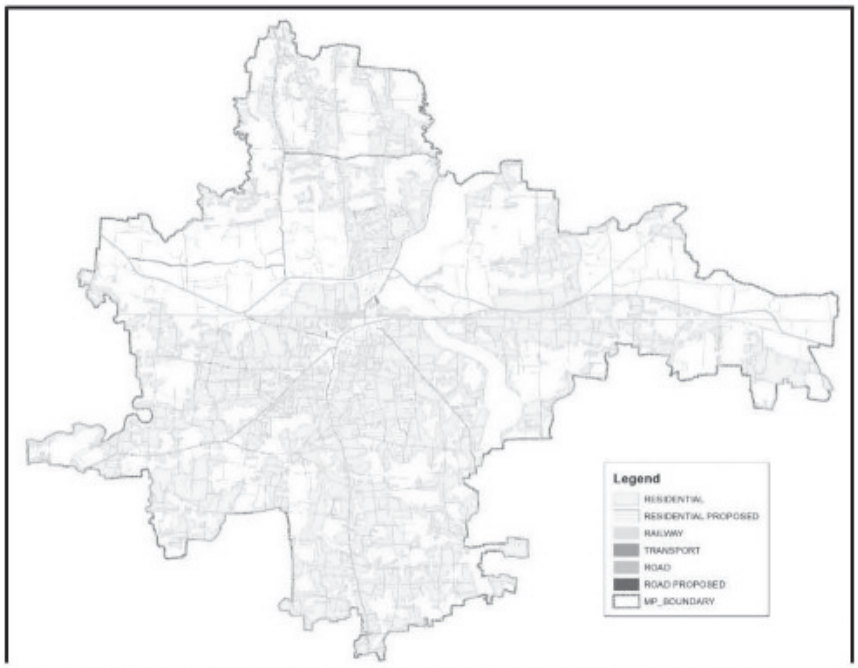


Figure 8-2Proposed Residential Land-Use in Nalbari Master Plan Area

- ***Commercial Area***

229.27 hectares which is 2.92% of the total developed area has been earmarked for commercial use. A composite zone of 12.31% along the National Highway will also be used to for commercial purposes. Accordingly, commercial land-use is proposed mainly to the north of the NH 31 besides developing it along the Hajo road and NT Road. A lot of unregulated businesses have also sprung up in the Master Plan area which will be accommodated to ensure public convenience and a sanitary environment to conduct their vocation.

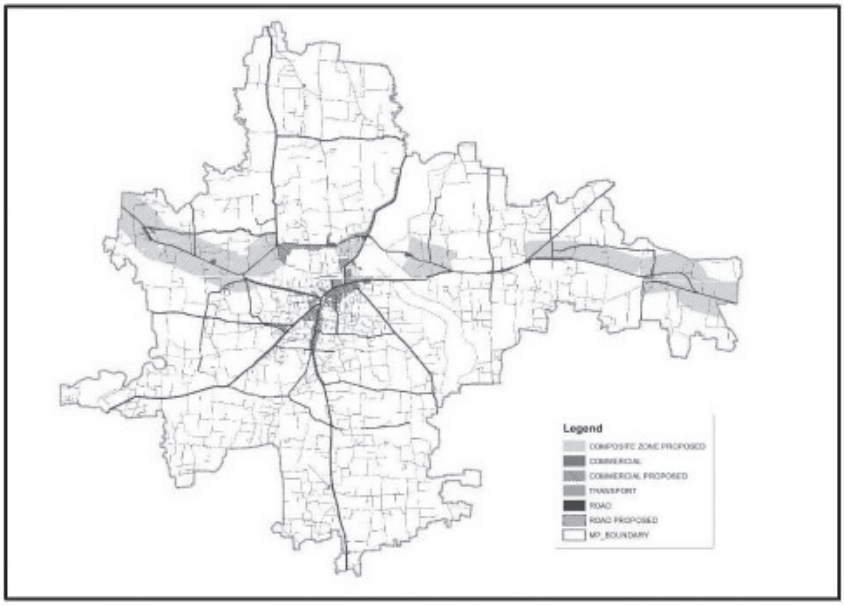


Figure 8-3Proposed Commercial & Composite Land-Uses in Nalbari Master Plan Area

- ***Composite Area:***

A composite zone of 967.64 hectares have been earmarked which is 12.31% of the total developed area. This zone is along the NH 31. In the eastern part of this zone, social and physical infrastructure is proposed to be set up, mainly to accommodate the needs that will arise once the Nalbari Medical College and Hospital becomes operational in the Ghograpar region. Hospitality sector and transportation is proposed to be developed in this zone. The medical college is approximately 11 km from the Nalbari town and Ghograpar is fast evolving into an urban center. Besides catering to the residential and commercial demand of the land, the composite zone can also be used for setting up light industries like bamboo, food processing, and handicraft.

- ***Industrial Area***

806.75 hectares of the land which is 10.26% of total developed area is earmarked for industrial land-use. This is around the range of 7-9% as laid by URDPFI. Nalbari Master Plan area is favourably located, with advantages of a good transportation network and proximity to market. To utilize this, a declaration has also been made by the Government of Assam that the area within 1 km beyond 500 meters on either side of the NH 31 from Jalukbari in Kamrup (metro) district to Tihu in Nalbari district shall be "Industrial Zone", excluding the tribal belts, notified forests, and wetlands. This has been taken into consideration in the proposed land-use of Nalbari Master Plan. The area towards north of NH 31 has been proposed to be developed as industrial zone.

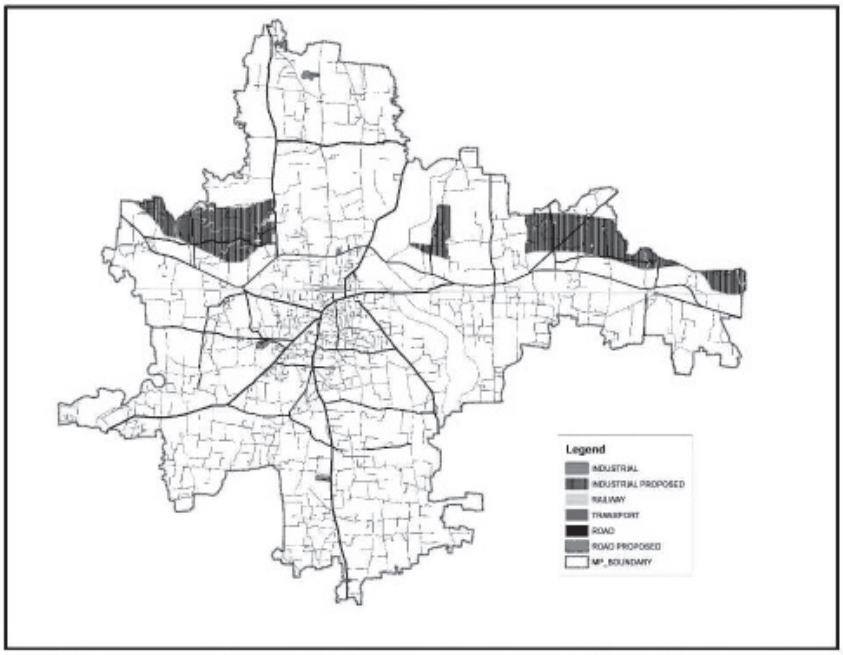


Figure 8-4Proposed Industrial Land-Use Map, Nalbari Master Plan Area

- ***Public and Semi-Public Area***

For public and semi-public land-use, 328.92 hectares or 4.18% of the total developed land has been earmarked. Considering the congestion in the current facilities providing public services, an area to the north of NH 31, near the SP Office, Nalbari has been demarcated for setting up public and semi-public infrastructure

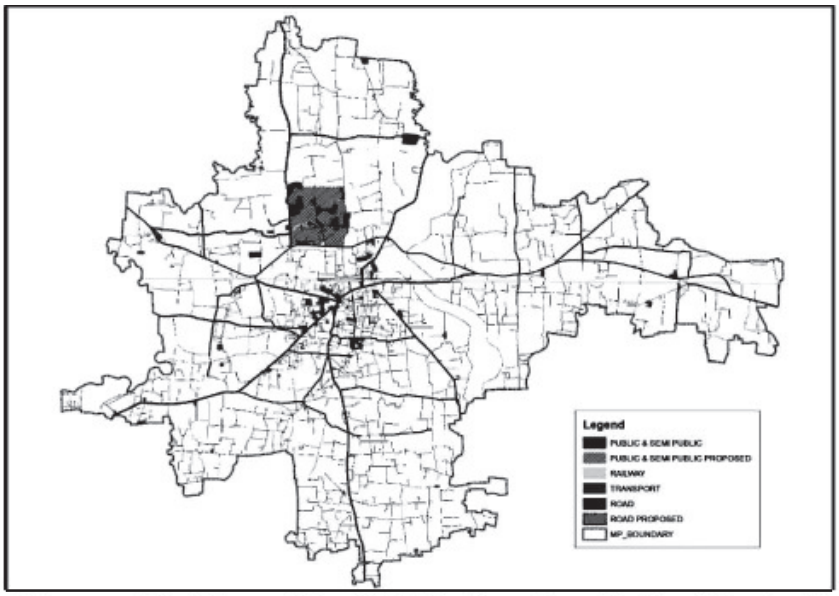


Figure 8-5Proposed Public and Semi-Public Area Map, Nalbari Master Plan Area

- ***Recreational Area***

69.61 hectares have been proposed for recreational land-use. Public parks and immersion ghats will be developed and modernized to elevate public comfort and provide ease of access to them. Riverfront development of the Pagladiya river has also been proposed. Recreational areas have been proposed to be set up in the east of Dhamdhama Bus stand and in the north-east of the Balilesa temple.

- ***Agricultural Area***

For agricultural land-use, 3618 hectares or 29.81% of the total area has been proposed. It has been found that large tracks of agricultural lands are lying fallow. Economic growth is accompanied by shift of these lands from agriculture to other uses. These lands have been proposed to be developed as residential and commercial land-uses. Also with increasing demand for land and the lucrative prices it gets offered in the market, agricultural lands are fast getting converted into residential and commercial land-uses. Hence, the dip from 45.55% of the existing total Master Plan Area to 29.81% in the land-use proposal.

- ***Green Belt***

20.10 hectares of land has been proposed to be developed as green belt. Green belts have been proposed in the fringes to arrest unrestricted and haphazard development and to provide people with opportunities of recreation. Also with proposals for industries, a green belt is integral for ensuring a good air quality.

- ***Dumping Ground***

30.27 hectares of land has been proposed for setting up dumping ground. Technologically and economically viable waste management methods will be practiced here.

- ***Eco-Sensitive Zone***

360 hectares of land has been earmarked as eco-sensitive zone. Wetlands, river banks and embankments have been identified as ecologically fragile zones. To minimize the impact of urbanization here, no developmental activities will be permitted.

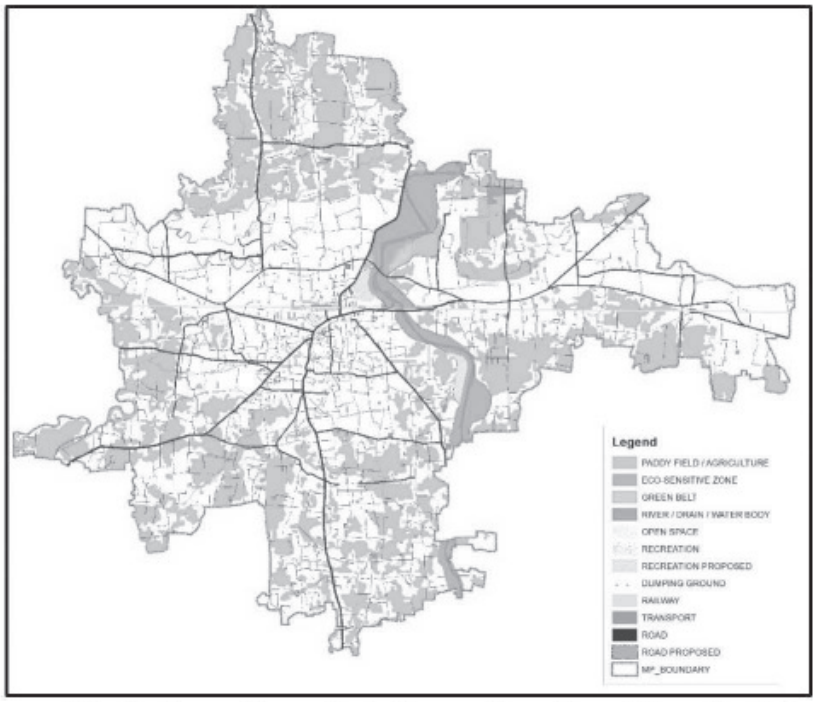


Figure 8-6Proposed Agriculture, Green Belt, Recreational Land-Uses in Nalbari Master Plan Area

- ***Transportation***

605.45 hectares of land has been earmarked for transportation and 52.08 hectares has been earmarked for railways. Truck terminals are proposed to be developed along the NH 31 to cater to the needs of the "industrial zone" that is being deliberated. 90 hectares of road widening and new road development are proposed within the master plan area. This will amount to 172 km length of new roads and road widening.

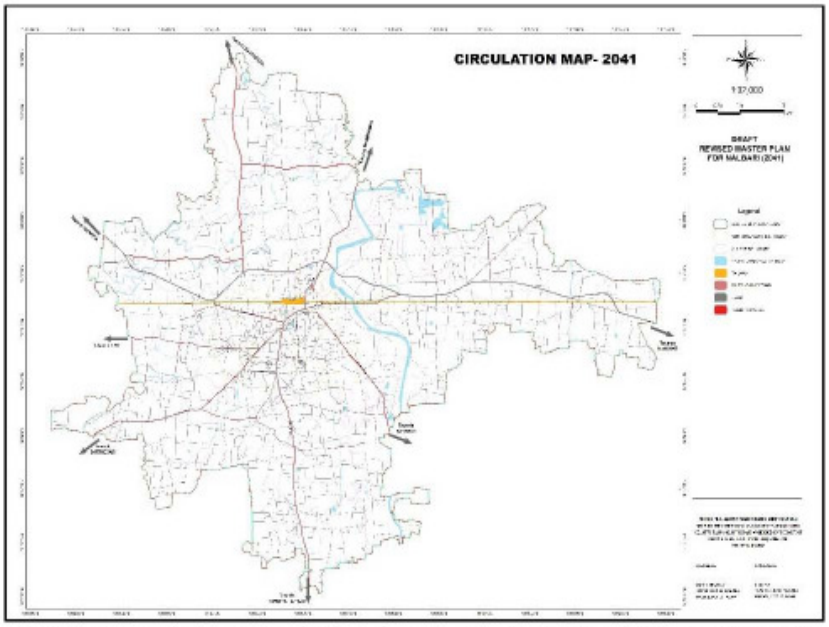


Figure 8-7Proposed transportation Land-use in Nalbari Master Plan Area

8.5 PROPOSED CIRCULATION PLAN :

Efficient functioning of an urban centre depends mainly on its transportation network. Economics, Social & Cultural life of the town is very much determined by the circulation pattern and transportation management.

In preparing the circulation plan for Nalbari, emphasis has been laid on the following points.

Optimum use of existing transportation network through improve traffic operations an controls.

Improvement of existing road network through widening, realignment and extension.

Improvement of existing road junctions and railway level crossings.

Provision of adequate parking facilities.

Development of new road and other transport facilities to provide effective linkages within the town and the region.

The entire road system of Nalbari has been proposed to be classified into the following main categories.

TYPE OF ROAD	PROOPSED WIDTH
1. Arterial Road ----------	24 Metres.
2. Sub Arterial Road ----------	18 "
3. Collector Road ----------	12 "
4. Local Road ----------	8.5 "
5. National Highway ----------	90 "

ARTERIAL ROAD :

An arterial road is primarily meant for through traffic usually on a continuous route. Major inter-urban travel between town centres and outlying residential areas or between major sub-urban centres is nerved by this road. Parking, loading and un-loading activities are restricted this type of road.

In the Nalbari Master Plan Area, the roads leading from the town to Barpeta via Chamata to Guwahati and to Dhamdhama are proposed to be upgraded to arterial roads. 24 kms of Arterial Roads from Barkura Chowk to Sandheli Chowk, Sandheli Chowk to Bala Mugkuchi Chowk, Bala Mugkuchi Chowk to Balilecha Mandir and Balilecha Mandir to Banbhag-Paikarkuchi road have been proposed for the purpose of quick and easy access from residential landuses to Industrial and composite uses.

SUB ARTERIAL ROAD :

It provides lower level of mobility than arterial roads parking, loading and un-loading are restricted and regulated on this type of road. Proposed width for this category of the road is 18.0 metres.

In the Master Plan Area, the proposed sub arterial road from a semi-circular pattern running from the N.T. Road towards south of the Master Plan Area. Another road running towards Digheli village to south of the Master Plan Area is also proposed to be upgraded to a sub-arterial road. Another road leads towards a Sariyahtali village in the south western part of the Master Plan Area.

COLLECTOR ROAD :

The function of this road is to collect and distribute traffic from the local streets to the arterial and sub-arterial roads. The road within the residential, commercial areas etc. are proposed to be developed into collector road, the minimum width of this type of road is proposed to be 12.0 metres.

LOCAL ROADS :

These roads are primarily intended to provide access to abuting lands and do not carry large volume of traffic. For this type of road the minimum width is 8.5 metres is proposed.

9. PROPOSED PROJECTS BRIEF AND TENTATIVE FUNDING SOURCE

9.1 INTRODUCTION

Nalbari Town is capable enough of generating economic momentum in sustained manner. As a growing city, benefits of its urban vivacity needs to be effectuated so that cumulative benefits are not only reaped by its residents but transcend the boundaries of wider spectrum of interspersed urban settlement.

For achieving this, future urban planning decisions need to be based on the judicious disposition of activities along with greater planning expediency to align its role for prosperity and planned urban development. The planning decisions of the Revised Master Plan are consciously aimed at sustained and planned city development. It is also a fact that Nalbari Town has shown economic and demographic momentum. In order to generate positive urban development, the Master Plan would focus on conscious decisions to provide impetus and support to anticipated urbanization.

9.2 BASED ON EXISTING CONDITIONS AND PROJECTED REQUIREMENTS OF THE PLANNING AREA, IDENTIFY PRIORITY SECTORS AND PROJECTS

The Guiding Principles for preparation of Revised Nalbari Master Plan 2041 are derived from planning experiences and challenges confronted in the city which include as following:

- Environmentally and Ecological Suitable Development
- Local Economic Development
- Sustainable and Integrated Transport System
- Inclusive and Collaborative Integrated Urban Development
- Mixed-use Development Policy

9.2.1 *Environmental and Ecological Suitable Development*

The topography and drainage system of this region presents a unique challenge towards attaining the perfect balance between resource conservation and utilization. The incorporation of effective environment conservation and sustainability features will be an important aspect in the preparation of this Master Plan. Environment conservation is a major issue that needs to be tackled while planning the development of any area. Efficient measures towards conserving the natural surroundings will be adopted, since the balance between natural and man- made surroundings significantly enhances the quality of life of residents.

Protecting the irrigated and fertile land as well as forest area and development in the less fertile area, will be the aspect of the planning proposal. An appropriate balance between built and un-built areas is proposed to be established so as to provide a good quality of life to the people inhabiting the area.

9.2.2 *Local Economic Development*

Nalbari is an important transit place in its region. Therefore, locational advantage of Nalbari from economic and tourism point of view needs to be viewed as important economic ingredient. To rejig its economy, local economic indicators need to be identified and objectively assessed for taking policy decisions. To improve the economic development in the region, restricting of the economic sectors has to be carried out for diversification and strengthening of economic base of the city. Job-oriented land-uses have to be propagated in the master plan so that present level of unemployment in the

region is drastically brought down. The Nalbari city shall have to be made economically vibrant with greater opportunities of jobs for its youth.

9.2.3 *Sustainable and Integrated Transport System*

Nalbari district has one of the highest vehicle growth in the state and the city is transforming very fast in its physical and socio-economic dimensions. Traffic congestion, parking, insufficient Road widths, decreasing Level of Service (LoS) of most of the city roads, inefficient public transport, etc. are some of the problems of urban transport and transport network in Nalbari city. Apart from this, like other cities there is complete disconnect between land-use and transport network. Keeping this in view, attempt has to be made to connect the two in scientific manner to make the land-use plan more functional. As a conscious policy decision, it has been guiding planning principle for this master plan to integrate the transport proposals enunciated in the City Mobility Plan of Nalbari with the land-use plan. Most of the CMP proposals have been kept intact in this master plan and made basis for structuring the disposition and intensity of land use as per TOD.

9.2.4 *Inclusive and Collaborative Integrated Urban Development*

The Revised Nalbari Master Plan Area is spread over 70 villages which also includes newly added 49 settlements predominantly rural in character. The countryside is viewed as a potential area of urbanization for Nalbari city in next two to three decades. Being close to the state capital and having good connectivity via road network and railway, the region presents a tremendous scope of growth. Having sound access to raw-materials and skilled and semi-skilled manpower, Nalbari can be elevated to a manufacturing hub. The basic planning principle is to create a sustainable blend of rural-urban continuum. The growth is proposed to be inclusive of all income groups integrating sectoral vision for holistic development of the region.

9.2.5 *Mixed-use Development Policy*

9.2.5.1 Concept

Any building(s) having a combination of more than one use at a specific point of time is said to have 'mixed use'. For example, a building having one use in the ground floor and other use(s) in the upper floor(s) is said to have mixed use. The mixed use shall not be misconstrued with the mixed use of a plot or a parcel of land. It is a vertical land use change of a building across its floors rather than a changeover space laterally. Mixed use is always a combination of main use and the uses which are incidental to the main use. While the main use is defined as the Primary use, the incidental use is construed as Secondary use. It is an important planning tool to accommodate the unforeseen land use changes resulting because of competitive market forces in city centres and along important streets. Mixed use has also become inevitable because of limited scope for horizontal expansion as well as scarcity of land in such areas. For example, commercialisation along main arterials within the residential areas is an illustration of land use conversion resulting because of such factors. The main requisite underlined for the mixed use model is the compatibility of the uses in terms of their type and intensity. In no case, the uses defined as obnoxious or hazardous in this master plan under land use regulations shall be permitted under mixed use category. The secondary use has to be essentially subsidiary or conforming in nature like convenient shopping, primary health and education facilities and basic public services and amenities having manageable impact on the surrounding land use. However, this trend has to be regulated and restricted as prescribed in this Master Plan for numerous benefits and as such, has been for purposes of this Master Plan defined objectively to avoid its misuse while issuing building permissions. For purposes of this Master Plan, mixed use is defined where:

In case of mixed use distribution, the secondary use shall be restricted to one floor only (preferably the ground floor) which is more susceptible to landuse changes. While issuing the mixed use permits, care should be taken to consider the Secondary use as ancillary use to the main use in size and scale within the structure.

9.2.5.2 Composite Mixed Landuse Model

As a policy measure, the proposed land use is viewed as a Composite Use broadly segregated and integrated across sectoral uses. As an inherent flexibility in the Proposed Landuse Plan, it is proposed to calibrate and to integrate the proposed land use to the hierarchy of road network in a horizontal mix, however, essentially segregating the hazardous and obnoxious uses. The policy is applicable to those uses which have been made permissible in a particular landuse.

In this Master Plan, a Composite Mixed Landuse Model is envisaged along the designated roads based on their proposed RoW. It is envisaged that the roads having proposed RoW laid down under DCRs at 13.5, a horizontal mix of landuses under Composite Mixed Landuse Model is proposed which shall be regulated by the respective space standards and building regulations of each use.

9.3 FUND REQUIREMENT FOR EACH SECTOR/PROJECT IDENTIFIED UNDER THE SECTORS

No fiscal plan has been worked out at this stage. The final Master Plan would provide a basis for preparation of five yearly development programmes and yearly fiscal plans for implementation.

9.4 IDENTIFY LAND SITE FOR PROPOSALS: IN CASE OF GOVERNMENT LAND, INVENTORY OF MUNICIPAL LAND, STATE GOVT./ GOVT. AGENCY OWNED LAND, ETC. AND PLAN FOR ACQUIRING/LEASING THE SAME

The revised Master Plan proposes Negotiated Land Acquisition in place of compulsory land acquisition as an innovation in land acquisition procedures for speedy urban development in consultation with various Govt. Depts.

Concept of land pooling: As per the survey conducted by Town and Country Planning, Nalbari, it was observed that few neighbourhoods in the villages included in the MP are not deficient of housing but these are cases of non development of these areas may be due to lack of awareness of education. So the people are staying in houses which are made of locally available materials. The economic conditions and livelihood for these families still is agriculture and day to day informal business. The main need of the hour is to impart awareness among these masses that where they are residing in not sustainable and pose a threat to their lives. There is an urgent need to upgrade these houses as they have the tenure ship but their economic progress make it hard for them to do the same.

9.5 INDICATIVE SOURCES OF FUND: SPECIFIC CENTRAL SCHEME FUNDS (10%, NLCPR, AMRUT, INFRASTRUCTURE DEV FUND, ETC) ASSAM FINANCE COMMISSION FUNDS, CM'S SPECIAL PACKAGE, PUBLIC PRIVATE PARTICIPATION, LOAN FROM (EXTERNALLY AIDED PROJECT (JICA-WORLD BANK-ADB), ETC.

Availability of adequate funds is an important determinant for successful implementation of the plan proposals. While conventional pattern of project financing is being in transition, the private investments and public private partnership modes of infrastructure development assumes greater

significance. This apart, the programmes of the National Government provides greater opportunities for improving the status of infrastructure and service delivery. Hence, it is the responsibility of every development agency concerned to take initiatives todraw maximum funding for the plan implementation.

9.5.1 *National Programmes and Funding agencies available for the resources in urban area.*

Integrated development of Small and Medium town Programme, is a programme of national importance, which has identified the sectors and projects eligible for assistance, which include:

i. Water Supply (including de-salination plants) and sanitation

ii. Sewerage and Solid Waste Management

iii. Construction and improvement of drains/storm water drains

iv. Construction/Up-gradation of roads, highways/expressways

v. Parking lots/spaces on Public Private Partnership basis

vi. Development of heritage areas

vii. Prevention & rehabilitation of soil erosion/landslides only in case of Special Category States where such problems are common and

viii. Preservation of water bodies.

10. DISASTER PLAN

10.1 INTRODUCTION

The District Disaster Management Plan is an effective plan which envisages several measures that can be taken in the event of any kind of disaster. The State Policy recognizes that hazards are inevitable but these need not convert into disasters. This Policy is based on the twin principles of minimizing human suffering during disasters and reduction of financial losses through integration of disaster risk reduction activities into development planning.

Owing to a unique geographical and geo-climatic setting, the State of Assam has witnessed a number of disasters, ranging from incidents of fires to destructive floods and catastrophic earthquakes. The State has witnessed many natural and manmade disasters especially in the 19th and early 20th century. In the wake of recurring disasters, the State has always paid heavily in terms of loss of life and property. Like other parts of the State, Nalbari Town is a multi-hazard prone area. Multi Hazards which are confronted in the city are detailed in table below-

Table 10-1Multi Hazards Areas Covered

Sl.No.	Hazard	Areas Covered
I.	Floods	Nalbari is one of the flood prone districts of Assam. There are several nos. of rivers and tributaries in Nalbari which originates from Bhutan hills. They are Pagladia, Baralia, Nona, Ghagra, Mora Chowalkhoa, Mora Pagladia, Tihu and Kaldia etc. They flows through the heart of the district and merges in the river Brahmaputra.
II.	Earthquakes	The tectonics of the Assam region is dominated by convergence of the India, Burma and Eurasian plates and is categorized as Seismic Zone- V which would need special measures to mitigate, minimize and safeguard the life, property and infrastructure which makes structural safety important.
III.	Landslides	Areas along major Riverbank
IV.	Drought	Most of the paddy growing areas depend upon the rainfall. The monsoon commences around the middle of April/May. For timely agricultural operation, a few showers of pre-monsoon rain is absolutely necessary. Regular rainfall till the middle of October can ensure a good harvest. But, if the rainfall at any circumstances will not happen then this will lead to improper agricultural operation and growth of crop and finally the drought will occur. So drought is caused due to failure of rains in season. The areas under drought need recharging and retention of water table for both urban and agrarian activities.
V.	Wind storm	Occasional wind storms is destroying crops, horticulture and houses in Nalbari & it is prone to high speed winds causing extensive damages to urban infrastructure and urban forestry.
VI.	Hailstorms	Although hailstorms rarely involve loss of lives, their economic impact can be severe. The damage appears to be a function of the intensity and duration of storms and the size of the hailstones, which these produce. The damage itself is often produced not only by the impact of falling hailstones, but also by the high winds and torrential rains that is part of the hailstorm.
VII.	Fires	In Assam due to peculiar housing patterns maximum fire accident cases takes place. These houses are of generally mud-built walls with thatched roofs made out of timber, bamboo and straw. They spring up in clusters. In summer fire accident becomes frequent; it destroys houses and properties and causes

		serious distress to the afflicted people. In Assam, the Harijans, Adibasis and other economically backward group who live in congested localities are the targeted victims of the Fire Accident. However, incidents of fires are recorded in the congested parts of the city and urban poor areas.
VIII.	Human induced disasters	All parts of the Nalbari Town vulnerable to man-made disasters due to competing urban uses, high cost of land and limited land resource.

District Disaster Management Authority should get area-specific hazard, vulnerability and risk maps prepared using GIS database for mitigation and emergency management. The plans so developed shall be operational, regularly reviewed and updated. This will help in the vulnerability assessment of the Nalbari after proper zonation. Specific measures like micro-zonation of Revised Nalbari Master Plan 2041 based on disasters and integrating it with the land use planning and zoning regulations, retrofitting of infrastructure and buildings, disaster-safe construction technology and strengthening the capacities of communities shall be promoted in a time-bound manner. The construction work and other activities that that may lead to situations eventually resulting in disasters shall be monitored regularly in vulnerable areas like water-bodies, hill slopes.

Hazards like earthquakes and cyclones do not kill people but inadequately designed and badly constructed buildings do. Ensuring safe construction of new buildings and retrofitting of selected lifeline buildings is a critical step to be taken towards earthquake mitigation. The Building construction, material and design specifications as laid down in the National Building Code-2005 shall have to be a mandatory requirement for important and high rise buildings. In case of areas having moderate to high vulnerability of flash floods and landslides, the buffer zones envisaged in this Master Plan need to be implemented while permitting any development in such areas.

10.2 SAFETY AGAINST NATURAL DISASTERS

10.2.1 *Earthquakes*

The application for seeking building permit shall be accompanied with a report of Architect/Structural Engineer certifying that the proposed structure has been designed structurally keeping in view the safety measures against earthquakes as indicated in the following Bureau of Indian Standards (B.I.S).

Bureau of Indian Standards (B.I.S).

a. IS: 13935: 1993
   Repair and Seismic Strengthening of building guidelines
b. IS: 1893 (part i): 2002
   Criteria for Earth quake Resistant Design of structure
c. IS: 4326 1993 (2002-04)
   Earthquake Resistant Design and Construction of building – Code of practice
d. IS: 13920: 1993
   Ductile Detailing of Reinforced Concrete structures subjected to seismic Forces – Codes of Practice
e. IS: 13827: 1993
   Improving Earthquake Resistant of Earthen Building – Guidelines
f. IS: 13828: 1993
   Improving Earthquake Resistance of low strength Masonry Building Guidelines.

10.2.2 *Fire Protection and Fire Requirements*

This part covers the requirements of the fire protection for the multi-storied buildings (high rise buildings) and the buildings which are of 15 mtr. and above in height and low occupancies of categories such as Assembly, Institutional, and Educational more than two storeyed and built-up area exceeds 1000 sq.mt. Business where plot area exceeds 500 sq. mt., Mercantile where aggregate covered area needs 750 sq.mt., Hotel, Hospital, Nursing Homes, Underground complexes, Industrial storage, Meeting/Banquet halls Hazards Occupancies.

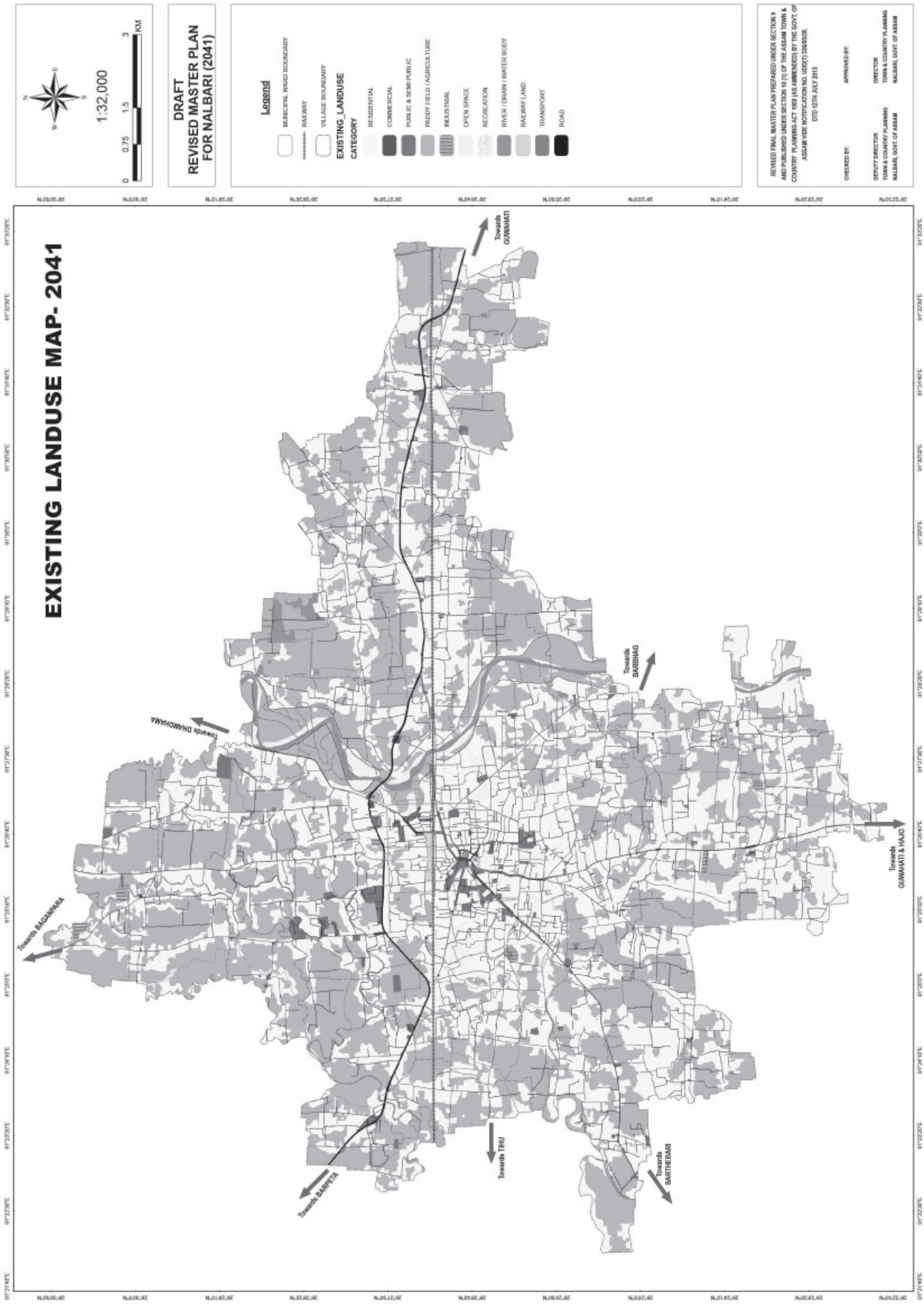
Fire protection requirements: Buildings shall be planned, designed and constructed to ensure fire safety and this shall be done in accordance with Part IV Fire protection of National Building Code of India. The building schemes as such also be cleared by the District Officer of the Fire and Emergency Services Department before issuance of building permit.

10.3 STANDARD OPERATIONAL PROCEDURE (SOP) ON DISASTER: PRE-DISASTER, DURING AND POST DISASTER

The District Disaster Management Plan-2014 (DDMP) updated by District Disaster Management Authority is an effective plan which envisages several measures that can be taken in the event of any kind of disaster within its territorial limits.

The plan deals with Risk Assessment and Vulnerability Analysis, Identification of disaster prone areas, Response structures, Inventory of Resources, Standard Operating Procedures, Directory of Institutions and key Individuals. The plan is prepared to help the District Administration focus quickly on the essentials and crucial aspects of both preparedness and response.

The Master Plan proposes that the facilities like hospitals, fire services, police, schools, water supply, bridges, flyovers and underpasses, electricity, grid stations are critical in nature for post – disaster management. To ensure functioning of critical facilities, buildings occupying such facilities and falling in Seismic Zone- V shall be retrofitted. District Disaster Management Authority- Nalbari, shall develop a clear cut retrofitting strategy at its own level for this purpose. Safety audit of all existing important public and assembly buildings shall be done within one year.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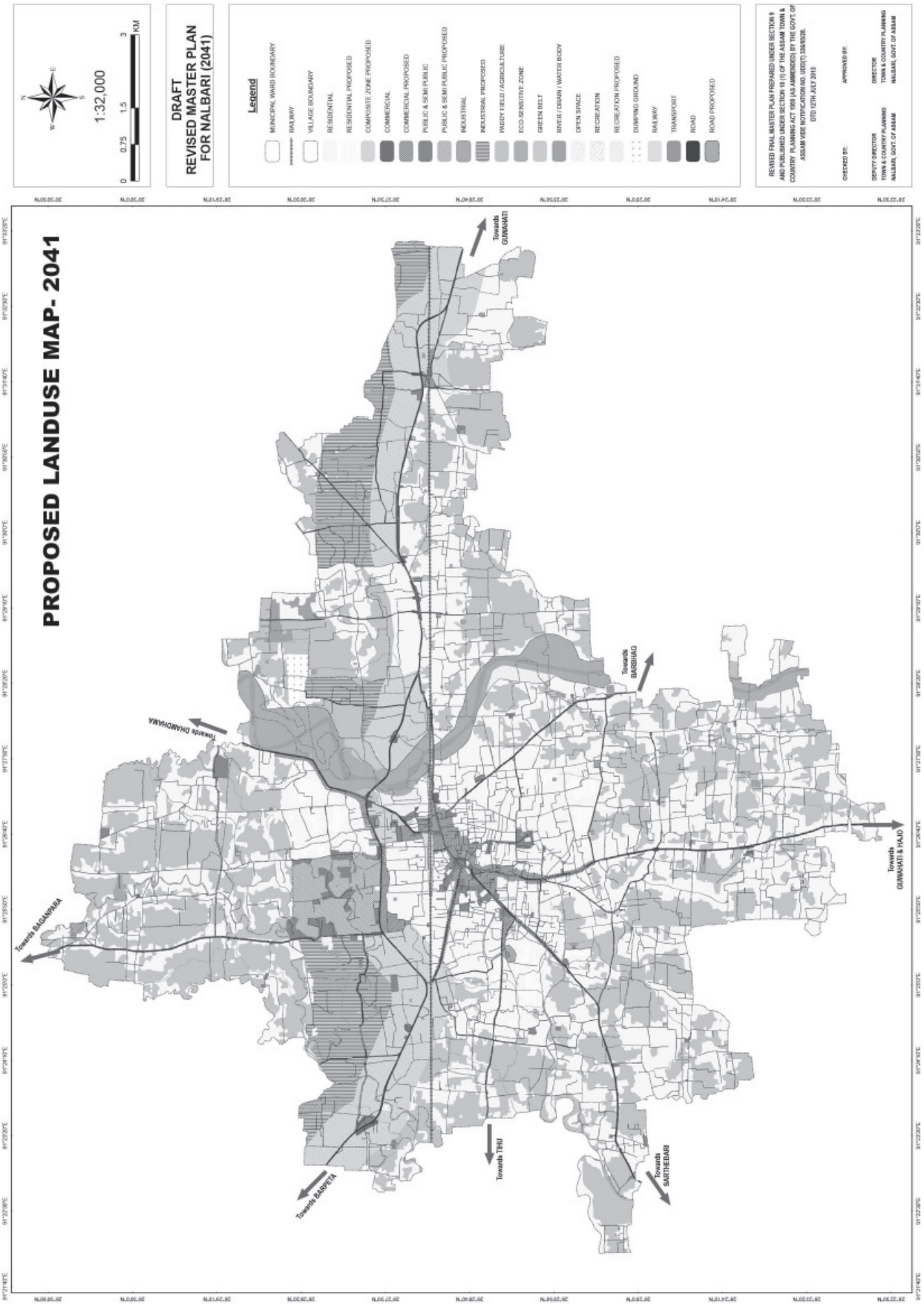
0 0.75 1.5 3 KM
DRAFT
REVISED MASTER PLAN
FOR NALBARI (2041)
Legend
MUNICIPAL/WARD BOUNDARY
RAILWAY
VILLAGE BOUNDARY
EXISTING_LANDUSE
CATEGORY
RESIDENTIAL
COMMERCIAL
PUBLIC & SEMI PUBLIC
PADDY FIELD / AGRICULTURE
INDUSTRIAL
OPEN SPACE
RECREATION
RIVER / DRAIN / WATER BODY
RAILWAY LAND
TRANSPORT
ROAD
REVISED FINAL MASTER PLAN PREPARED UNDER SECTION 9 AND PUBLISHED UNDER SECTION 10 (1) OF THE ASSAM TOWN & COUNTRY PLANNING ACT, 1959 (AS AMENDED) BY THE GOVT OF ASSAM VIDE NOTIFICATION NO. UDD(T) 336/09, DTD 12TH JULY 2013
CHECKED BY:
APPROVED BY:
DEPUTY DIRECTOR
TOWN & COUNTRY PLANNING
NALBARI, GOVT. OF ASSAM
DIRECTOR
TOWN & COUNTRY PLANNING
NALBARI, GOVT. OF ASSAM
EXISTING LANDUSE MAP- 2041
Towards GUWAHATI
Towards BARBHAG
Towards DHAMDHAMA
Towards BAGANPARA
Towards GUWAHATI & HAJO
Towards TIHU
Towards SARTHEBARI
Towards BARPETA


PROPOSED LANDUSE MAP- 2041
DRAFT
REVISED MASTER PLAN
FOR NALBARI (2041)
1:32,000
0 0.75 1.5 3 KM
Legend
MUNICIPAL WARD BOUNDARY
RAILWAY
VILLAGE BOUNDARY
RESIDENTIAL
RESIDENTIAL PROPOSED
COMPOSITE ZONE PROPOSED
COMMERCIAL
COMMERCIAL PROPOSED
PUBLIC & SEMI PUBLIC
PUBLIC & SEMI PUBLIC PROPOSED
INDUSTRIAL
INDUSTRIAL PROPOSED
PADDY FIELD / AGRICULTURE
ECO-SENSITIVE ZONE
GREEN BELT
RIVER / DRAIN / WATER BODY
OPEN SPACE
RECREATION
RECREATION PROPOSED
DUMPING GROUND
RAILWAY
TRANSPORT
ROAD
ROAD PROPOSED
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NALBARI, GOVT. OF ASSAM
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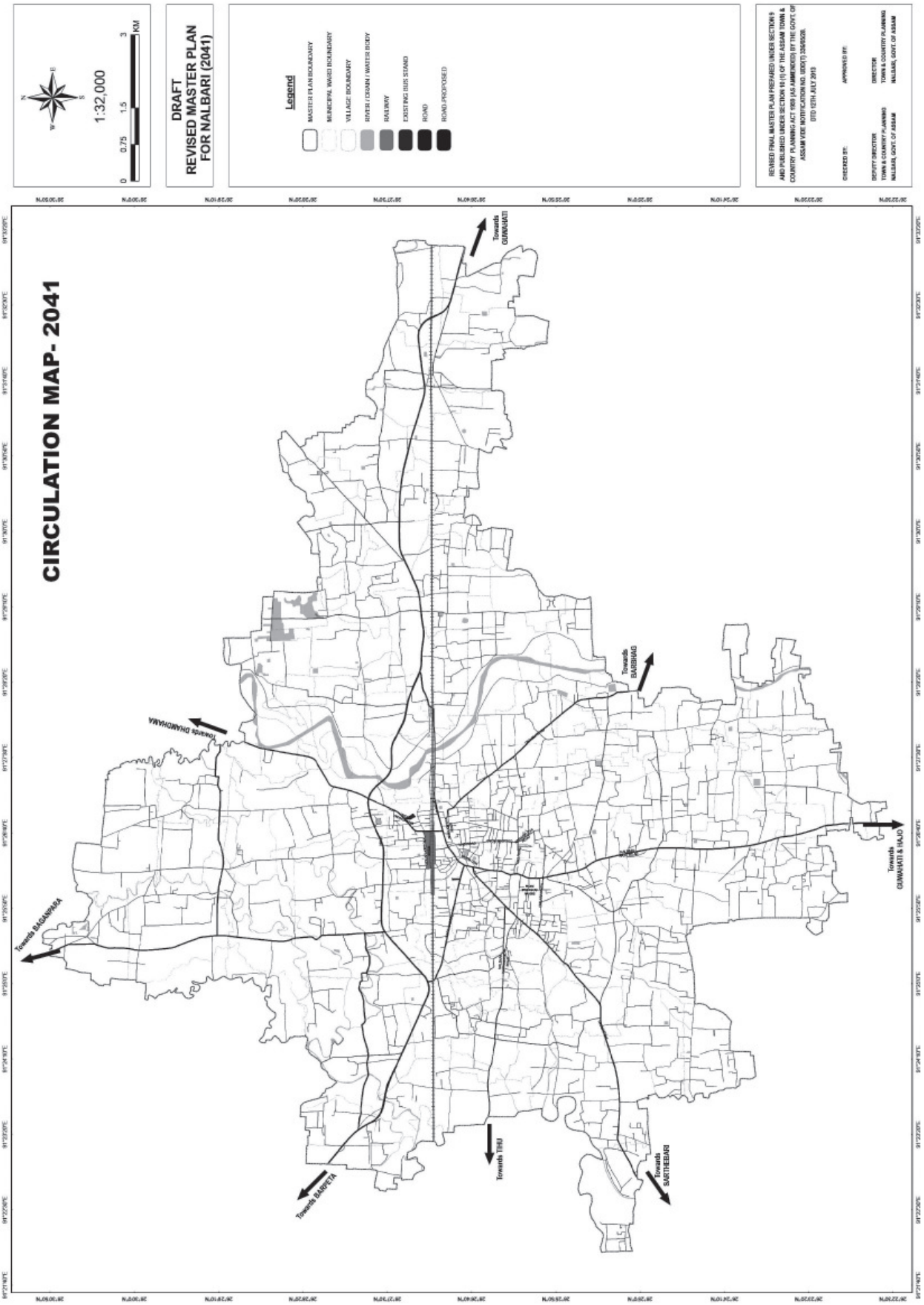
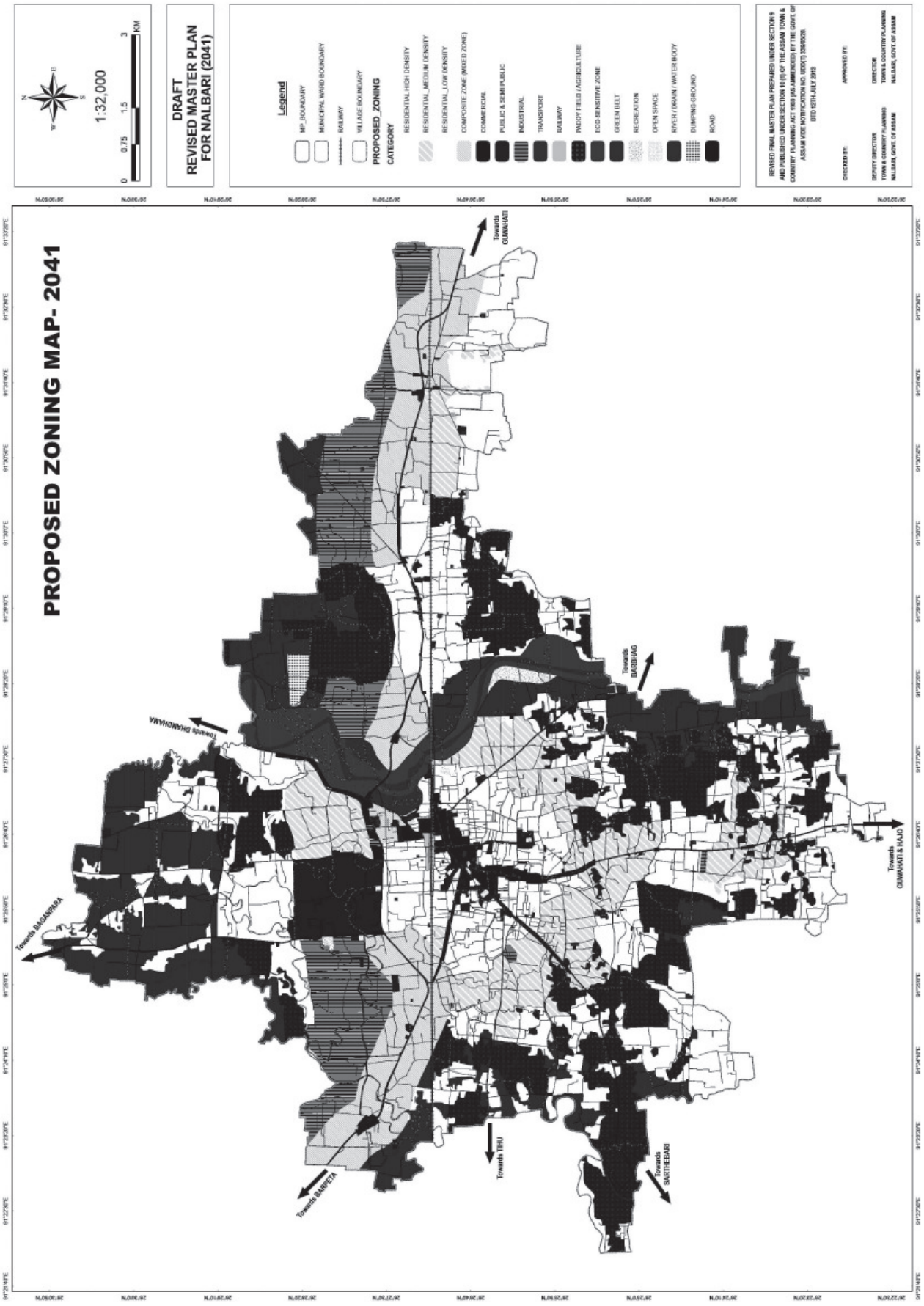
NALBARI, GOVT. OF ASSAM
Towards GUWAHATI
Towards BARBHAG
Towards DHAMDHAMA
Towards BAGANPARA
Towards GUWAHATI & HAJO
Towards TIHU
Towards BARPETA
Towards SOUTHBEHAR


DRAFT
REVISED MASTER PLAN
FOR NALBARI (2041)
1:32,000
0 0.75 1.5 3 KM
Legend
MASTER PLAN BOUNDARY
MUNICIPAL WARD BOUNDARY
VILLAGE BOUNDARY
RIVER / DOAAN / WATER BODY
RAILWAY
EXISTING BUS STAND
ROAD
ROAD PROPOSED
CIRCULATION MAP- 2041
Towards GUWAHATI
Towards BARBHAG
Towards DHAMDHAMA
Towards BAGANPARA
Towards GUWAHATI & HAJO
Towards BARPETA
Towards TEZU
Towards SOUTHERN



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