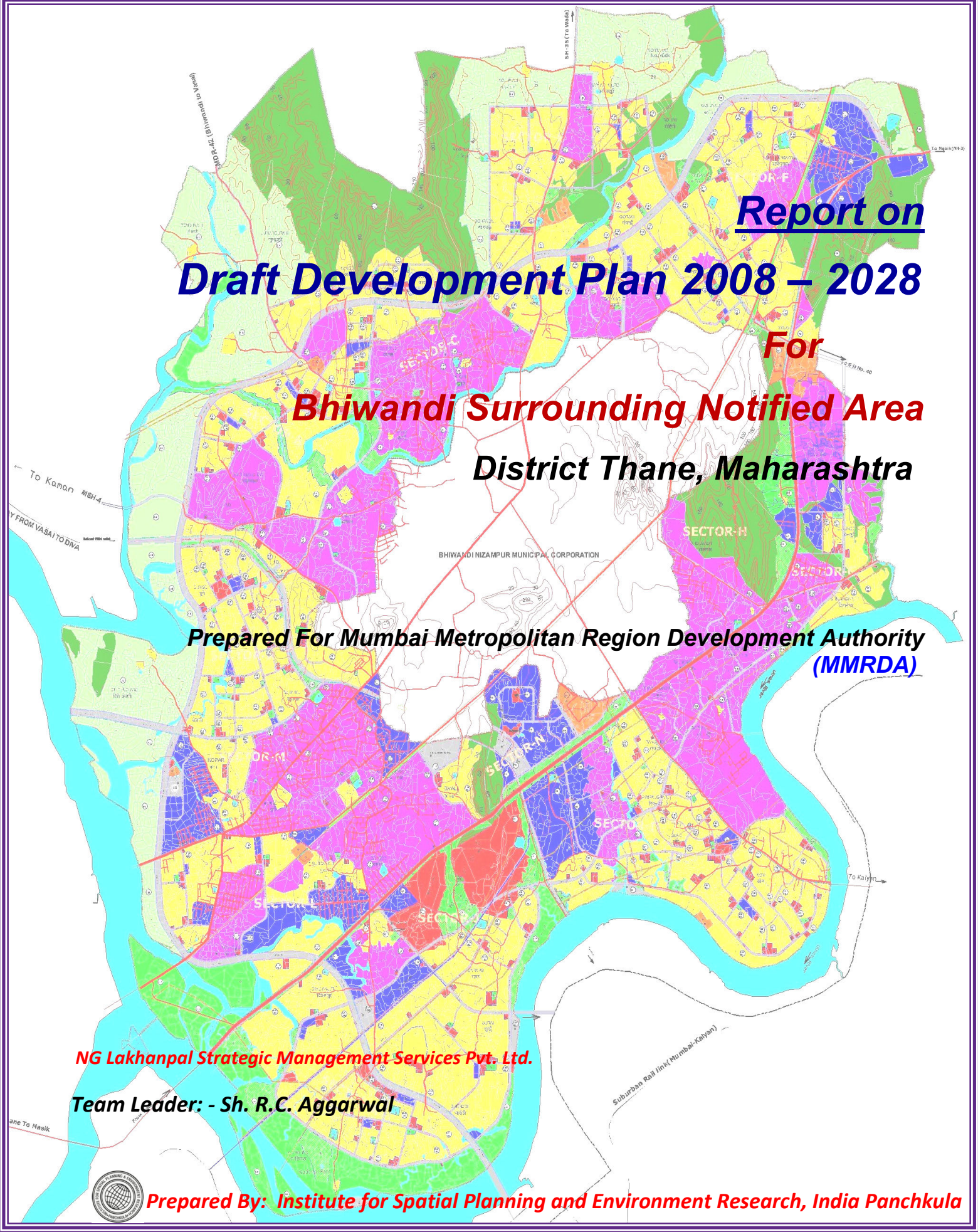

Report on

Draft Development Plan 2008 – 2028

For

Bhiwandi Surrounding Notified Area

District Thane, Maharashtra

Prepared For Mumbai Metropolitan Region Development Authority (MMRDA)

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Vision 2028

"Intertwining heterogeneity to attain homogeneity focusing on economic growth, resource mobilization, improving quality of life by encouraging private sector and citizen participation to promote and sustain growth with social justice and minimal adverse environmental impact."

Executive Summary

1. Introduction

Bhiwandi Surrounding Notified Area (BSNA) bounded by natural features like rivers, creeks, hills and ridges on all sides is strategically located. Its physical setting restricts its multidirectional development. Historically, Mughals and Portuguese had ruled Bhiwandi. Under the influence of the Mughals and Portuguese, the Muslim population concentrated in the region and village named Nizampur came into existence. The Britishers took over the control of Bhiwandi in 1817 and used the area as a trade center and Army Camp. They also laid down water supply pipelines and Central Railway line. With better water facilities, improved transportation linkages and establishment of handlooms and power looms, the area started developing gradually. During mid 1860's the Bhiwandi Municipal Council came into existence.

Independence of India followed by rapid development of cotton industry, Bhiwandi saw huge influx of migrant labour from Uttar Pradesh, Bihar, Hyderabad, and other parts of the country. Gradually, Bhiwandi became the leading producer and supplier of cotton cloth in the country. In addition, due to nearness to Mumbai and Thane and availability of cheap land or rent, godowns and warehouses started developing along the old Agra road. The Rail connection between Vasai and Diva serving Bhiwandi also promoted the growth of godowns/warehouses in Bhiwandi and BSNA. The major nearest railway stations for BSNA are Kalyan and Bhiwandi. BSNA has good road linkages with the major settlements through National Highways and State Highways crisscrossing the area.

2. BSNA Constituent Villages*

Originally were 51 villages notified but subsequently some notified villages were reorganized and the number increased to 60, whereas census data (2001) available is for 56 villages given in the table below:

Sr. No	Name of Village	Area in (Sq km)	Total Population	Sr. No	Name of Village	Area in (Sq km)	Total Population
1	Alimghar	4.04	3353	30	Mankoli	1.42	2310
2	Anjur	4.03	2937	31	Nimbavali	1.42	950
3	Bharodi	0.29	1243	32	Ovali	2.02	1215
4	Bhinar	2.00	1519	33	Pimpalghar	0.35	1068
5	Borpada	1.81	1341	34	Pimpalas	4.48	3386
6	Dahyale	0.42	257	35	Pimpalgaon	0.64	2023
7	Dapode	2.09	1677	36	Pimpalner	3.26	1748
8	Dhamangaon	4.06	2025	37	Purne	2.73	2772
9	Dive-Kevani	3.4	1731	38	Rahanal	3.62	6906
10	Dive Anjur	5.18	2835	39	Ranjnoli	1.34	2760
11	Dunge	2.00	1729	40	Sarang	1.21	693
12	Elkunde	2.03	551	41	Saravali	1.38	1877
13	Gundavali	1.02	1784	42	Savandhe	1.12	1885
14	Gorsai	2.33	1779	43	Shelar (CT)	5.27	10612
15	Gove	2.18	2795	44	Shivnagar	4.14	2433
16	Junandurkhi	7.95	3208	45	Sonale*	2.93	999
17	Kalher	5.22	7485	46	Sontakka	2.95	908
18	Kalwar	2.01	2941	47	Surai	1.58	1343
19	Kambe	5.52	5086	48	Tambhavali	1.45	1315
20	Kasheli	3.6	2345	49	Vadpe	4.69	1268
21	Kashivali	1.16	573	50	Vadghar	0.74	1267
22	Katai (CT)	3.56	11252	51	Vadunavghar	5.49	2584
23	Kawad Khurd	5.3	2643	52	Vaghivali	2.08	1545

24	Kevani	1.89	2186	53	Val	0.66	1095
25	Karivali	3.34	615	54	Vehele	6.44	2340
26	Khoni (CT)	1.8	22686	55	Valshind	3.03	807
27	Kolhivali	2.49	2294	56	Yavai	2.07	491
28	Kon (CT)	5.55	15159				
29	Kopar	0.68	1004		**Total**	**151.09**	**165633**

* *Gholgaon ,Rajnagar, Thakurgaon and Rohini are newly carved four villages*

3. Demography

Demographically, four villages of the BSNA-Khoni, Katai, Shelar and Kon were categorized as Census towns in 2001. Out of these four villages, three namely Khoni, Katai and Shelar adjoin the municipal limits of the BNMC whereas; Kon town has grown under the influence of Kalyan city. The literacy rate in BSNA has considerably improved from 44 percent in 1981 to 77 percent in 2001.The overall qualitative increase in literacy may be due to improving economic conditions and expansion of schooling facilities in the area. Villages having larger concentration of godowns, warehouses and power loom units also have larger population. These villages are Khoni, Kon, Katai, Shelar, Rahanal, Kasheli and Dive Anjur.

4. Physiography, Drainage and Climate

The relief analyses reveal that nearly half of BSNA is below 10m contour level forming a low-lying area. The areas along the Ulhas and Kamvadi Rivers are prone to floods where water level rises upto 4-5 feet above mean sea level. The area is underlain by basaltic lava flows (Deccan trap) and largely free from earthquakes. The region has loam, sand, sandy loam and sandy clay soils. The ground water table varies from 4m to 7m in pre-monsoon season and from 0.5m to 1m deep in post-monsoon season. The drainage conditions of BSNA are poor. The monthly temperature ranges between 16^0C to 34^0C. BSNA having humid tropical climate receives 400-800mm annual rainfall. The relative humidity varies from 47 percent to 88 percent in the region.

5. Infrastructure

BSNA lacks in social infrastructure. Not all the villages in BSNA have primary schools. It lacks in higher educational facilities both general and technical. There are only five educational institutions imparting education at senior secondary (Junior College) level. There is only one Polytechnic in village Khoni. For higher-level education particularly professional, students of the area go to Thane and other major urban settlements. There is only one hospital in village Purne inadequate to cater to the health needs of the area. The dispensaries are not equally distributed as these are only concentrated in the northeast and southwest BSNA. Banks and post offices are also not fairly distributed.

There are 4 water works in BSNA which cater to not only the population of Bhiwandi city but also the population of Mumbai and other surrounding areas. There are four electric sub-stations with different load capacities. There is only one Sewage Treatment Plant in the entire BSNA.

There is a wide gap between the demand and supply of water in the BNMC. The water is supplied from four different sources i.e. 35 MLD from Pipe Lines, 3 MLD from Varhala Lake and the remaining 74 MLD from Shahad Temghar Water Works. However, with the increasing population of the region, these existing water supply sources are incapable of catering to the demand. There is a need to upgrade the sources of water supply in the area to cater to the existing as well as future water demand.

The sewerage network is only in one-fourth of the BNMC. Rest of the area remains un-served and the sewage from the city and major settlements of BSNA is disposed off directly into the rivers Kamvadi and Ulhas. The solid waste of BNMC is disposed off at the site in village Katai of BSNA. It has been incapacitated and is a health hazard to the residents.

6. Economy

The economy of BSNA has experienced perceptible changes. There has been increase in workforce in secondary and tertiary sectors and considerable decline in primary sector activities during 1981 to 2001. Cotton textile industry and warehousing activities have made the trade and commerce of BSNA vibrant. Paddy is an important crop of BSNA.

7. Transportation and Communication

Traffic and transportation study reveals that BSNA has good connectivity with the neighbouring urban centres such as Thane, Kalyan, Vada to name a few, through National Highways and State Highways. The multi-axle vehicles carry excessive load on the existing roads particularly on Old Agra road. The truck movement on these roads is more due to dominance of godowns, warehouses and power loom units. The existing roads and support infrastructure are not capable of catering to the increasing volume of heavy vehicles. The problems of congestion, traffic jams, noise pollution, time loss particularly on Old Agra road and encroachments are in vogue. There is also no parking facility for heavy vehicles or goods moving vehicles and no separate truck terminal exists in the area, which further adds to the traffic problems. The sub-urban railway facility to the region is missing. The connectivity among the villages is very poor. Majority of the villages do not have the facility of the public transportation and movement to other areas is by personal vehicles.

8. Physical Environment

The physical environment of BSNA is calm and healthy that needs protection in area wherever degradation due to mining, solid and liquid wastes and deforestation has taken place. On one side, the area under forests, agriculture and water bodies create a green and healthy environment in the region, the handloom and power loom units create noise pollution, textile and dyeing industries pollute the ground water quality and air quality, the sewer disposal in Ulhas and Kamvadi rivers pollute the water. A number of brick kilns have affected the surface geology of BSNA that offers considerable potential for developing recreational centres particularly in the north and eastern parts. Some villages (Junandurkhi, Kambe and Gorsai) in the northwestern part also have a good environment and potential to develop recreational centres, which BNMC and BSNA both lack.

10 SWOT Analyses

The strength, weakness, opportunity and threat (SWOT) analyses reveal that BSNA offers tremendous future growth and development potentials. The major strengths of BSNA include nearness to Megalopolis Mumbai, cheaper accommodation for working population of Mumbai, capacity to accommodate the spillover of Mumbai, growing warehousing/storage availing higher level infrastructural facilities of Mumbai. Better linkages of BSNA with the neighbouring areas offer huge potential for developing recreational centres.

The major weaknesses of BSNA are overshadowing effect of Mumbai Megalopolis reducing Bhiwandi as bedtime city for a large number of employees commuting daily to Mumbai. Unsatisfactory workplace-residential area relationship and missing fast and direct railway link between Bhiwandi and Mumbai are the other weaknesses. Physical setting, presence of pipelines low-lying areas, marshy lands, creeks, meandering rivers, higher inundation, poor drainage system are other handicaps in the growth potential.

The major opportunities include scope for huge housing market for middle and lower income groups. The crash-housing programme will provide employment opportunity and planned living environment for a large number of people. A very high potential for urban development exists in 15 villages designated by Department of Land Records under the influence of BNMC while fixing the land values. BSNA offers possibilities of establishing institutions, offices and commercial establishments, which cannot be developed in Mumbai because of scarcity of large pockets of land. Remaining villages of BSNA offer scope for large-scale recreational parks and sports complexes, logistics and transport hubs. Theme parks such as textiles, pharmaceuticals, Special Economic Zones and general industrial estates can be developed.

Major threats are to the picturesque landscape of BSNA where haphazard and unplanned growth has taken place without integrated planning. Pollution from industry, disposal of untreated sewage into the rivers, traffic pollution, deteriorating public health and sanitation conditions, heaps of garbage littering around in the BNMC are affecting the visual outlook and image of the BSNA.

9. Study of Some Good Practices

Regulating future urban growth and to wipe out infrastructural backlog the concept of metropolitan region was introduced. Experiences in Metropolitan Regional Planning are the lessons of future planning for attaining harmonious development of Metropolitan Regions and Metropolitan Interlocking Regions. For lessons the National Capital Region of National Capital Territory, Delhi (India) Tokyo Metropolitan Region (Japan), Colombo Metropolitan Region (Sri Lanka), London Metropolitan Region, (United Kingdom) and Shanghai Metropolitan Region (China) were studied.

Study of these different concepts and objectives of the Metropolitan Regions reveals that the urban phenomenon worldwide is similar. The variation is only in the gravity of the urban infrastructural problems and urban management. The problems of Shanghai, Colombo or Tokyo are not different from Mumbai. However, the approach of Tokyo Metropolitan Region Plan is different because Regional Plan is one of the components of the National Land Sustainability Plan. The problems of Colombo are largely similar to Mumbai. Therefore, the approach and contents of Colombo Metropolitan Region are largely similar to the MMR. However, the Regional Plan NCR, Delhi and Mumbai Metropolitan Region are rich in content and insight. Like NCR Delhi that identified counter magnets outside NCR, the time is ripe for adopting the approach of Interlocking Metropolitan Regions within Maharashtra for achieving the objective of balanced regional or state development. Let Maharashtra take the lead.

10. Determinants of Planning Proposals

For preparing Draft Development Plan various determinants that have direct bearing on the proposals taken into consideration enumerated are as under:

I. Planning practices in the past;
II. Development Plan for Bhiwandi- Nizampur Corporation Area;
iii. Relevant Policies of the Regional Plan (1996-2011 concerning allocation of land for various uses to guide formulation of planning proposals;
iv. The proposals of the Mumbai Metropolitan Region (MMR);
iv. The proposals of Comprehensive Traffic and Transportation Study for MMR to guide the transportation network of BSNA;
v. The planning proposals of various Government Departments and the approved proposals of private organizations to form part of the proposals and the policies;
vi. Issues emerging in meetings held with the major stakeholders including Town Planning Department, Thane, Bhiwandi-Nizampur Municipal Corporation, the B.D.O. office, Bhiwandi and Sarpanches and Panches of village Panchayats.

11. Corridors of Development

Various corridors of development as continuum of Bhiwandi were identified given as under:

I. Bhiwandi-Junandurkhi-Major District Road-42 Joining State Highway- No 40 leading to NH-No 8,
II. Shelar-Vada State Highway- No 35,
III. Old Thane-Nasik Highway upto its meeting point with NH- No 3 in Village Vadpe,

IV. New bypass of Thane-Bhiwandi-Nasik Highway, NH- No 3,
V. Bhiwandi-Kalyan Road
VI. Mankoli-Anjur-Surai-Pimplas Road Forming loop with NH- No 3,
VII. Bhiwandi-Vasai Major State Highway- No 4 leading to NH- No 8.

12. Limitations of Urbanization

Various limitations of future urbanization and scope for development identified are as follows:

I. Maximum existing urbanization is upto the contour height of ten (10m) mtr above mean sea level and area that is less than 5 metres from the mean sea level is floodable.
II. The villages namely Shelar, Khoni, Katai, Karivali, Rahanal, Kalwar, Kailash Nagar, Val, Purne, Kalher, Kashivali, Gundvali, Dapode, Ovali and Gholgaon built contiguous have coalesced with BNMC.
III. The villages namely Ranjnoli, Gove, Pimpalghar, Saravali and Kon, are the outgrowths of Kalyan city towards Bhiwandi along Kalyan-Bhiwandi Road i.e. NH- No 222, separated by Ulhas river from Kalyan.

13. Flood Prone Areas

River Kamvadi, Ulhas and upsurge in Creeks are the main sources of flooding described as under:

I. Kamvadi river is below ten-metre contour and it floods the adjoining villages namely Gorsai, Savade, Shelar, Khoni, Katai, and Karivali.
II. Villages flooded by the Ulhas are Kon, Pimplas, Vehele, Surai, Sarang, Bharodi, Alimghar, Anjur and Dive Anjur (Highway).
III. Parts of villages Ranjnoli, Pimplas and Gove are low lying and Marshy due to frequent floods as a result of surge in Ulhas river,
IV. Parts of villages Dive Anjur (Highway), Purne, Kalher and Kasheli are flooded due to surge of Ulhas river and Kalyan (Thana Creek) Creek,
V. Parts of villages Dive, Kevani and Dunge are prone to floods due to surge in the Basai Creek.

14. Eco-Fragile Areas

Fragile areas identified are:

I. 20 metres contour marks the beginning of eco-fragile area that includes forestlands and areas of natural vegetal cover.
II. The extensive brick kiln activity is in the close vicinity of habitation and the eco-fragile areas (i. above). This activity is common in the areas formed by the process of deposition over the years as fertile agriculture land- a continuing source of subsistence and sustenance of local inhabitants.
III. Industrial activity is also visible anywhere or everywhere.
IV. Riverfronts are the solid waste dumping sites and untreated industrial and domestic waste is thrown directly into the rivers.

15. Costal Regulation Zone

Costal Regulations as notified by Ministry of Environment and Forests, Government of India applicable to the creeks, rivers and estuaries, permissible land uses, low and high tide lines and highest flood level have been given due consideration.

16. Projects in Pipeline

The projects in pipeline given consideration are listed as under:

I. Proposal of Mono-Rail from Kalyan to Thane via Bhiwandi,
II. Proposed Delhi-Mumbai Dedicated Freight Corridor (Western Corridor),
III. Proposals of Comprehensive Transport Study (CTS) related to BSNA.
IV. The proposed multi-modal corridor from Alibag to Vasai by MMRDA
V. Chitale Committee Report,
VI. Proposals of Maharashtra Industrial Development Corporation.

17. Cognisance of Regional Plans

MMRDA revised the Regional Plan-1973 to take into account the changes occurring in population, economy and physical developments in the region. It undertook:

I. Preparation of existing land use by using remote sensing techniques;
II. Preparation of urban sprawl maps, existing land use maps and urban land use zoning maps for the Region;
III. Conducting a Multi-purpose Household Survey on sample basis for the region;
IV. Formulating land use proposals for future growth in the Region by integrating the results of various studies;

There were departures from the Regional Plan 1973 but only in the development strategy and policies enabling the successful implementation of the development strategy. Some of the main departures are as follows:

I. Regional Plan 1973 observing ever increasing population as the root cause of Greater Mumbai's problems, envisaged restricting Greater Mumbai's population to 7 million by banning setting up new industries, offices and commercial establishments and by relocating certain economic activities at new locations having growth potentials yet maintaining the city's vitality as the 'Engine of Economic Growth'.
II. Regional Plan 2011, in a paradigm shift, recognized Mumbai playing an important role as generator of national wealth. Not restricting its growth, the approach was to facilitate the development by providing infrastructure and by removing the barriers of economic progress.
III. Recognizing the need of providing high quality infrastructure especially, telecommunication and transport, office complexes, housing, good living environment, it acknowledged that the objective can be achieved by involving private sector investments in infrastructure development in addition to the public sector investments. Thus, enabling development strategies were worked out in the Regional Plan, 1996-2011.

18. Existing Land Use Analyses (2008)

Since existing land use data of BNMC given in CDP is very old (1985) and to observe changes, it was digitized from Quick bird imagery (2008) that has been used to prepare the existing land use map of BSNA. It

was observed that due to discrepancies in the data of CDP, it is difficult to authenticate the data indicated under the head of non-developable area. However, it does indicate the process of urbanization reducing the area that was either under agriculture, open spaces or the water bodies in the year 1985.

The total area of the BSNA computed on GIS platform is 144.39 Sq km. The existing land use map prepared from satellite imageries with 1M spatial resolution indicates maximum about 58 percent use of land in BSNA under agriculture. The area under forest cover is 9 percent followed by marshy land (7.61percent). The area under wetlands based on CRZ notification accounts for about one-fifth of total notified area. Among the built-up uses, the highest proportion of land (4.50 percent) is under warehousing/godowns, closely followed by residential and industrial uses. The land covered under public/semi-public amenities is insignificant.

Sr. No	Land use Class	Area (Ha)	Per cent to Total BSNA
A	**Built-up Uses**		
1	Residential	525.68	3.64
2	Industrial	371.22	2.57
3	Commercial	82.77	0.57
4	Transportation and Communication	75.54	0.52
5	Warehousing/Godowns	651.12	4.51
6	Mixed	118.08	0.82
7	Public/Semi -Public	26.94	0.19
8	Electric Sub-Stations	27.40	0.19
9	Overhead Reservoir	0.36	0.00
11	Water Works and Treatment Plant	36.50	0.25
12	New Structures	0.31	0.00
B	**Total Urbanizable Area**		
13	Agricultural Land/ Green Zone	8454.15	58.55
14	Forest	1303.76	9.03
15	Marshy Land	1101.68	7.63
16	Culturable But Barren Land	484.47	3.35
17	Mining Area	155.48	1.08
18	Brick Kilns	128.94	0.89
19	Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc)	458.93	3.18
20	Open Spaces and Green Belt	437.05	3.03
C	**Total Area**	14440.39	100.00

The mixed-land use category covers a little less than 1percent of the BSNA. The availability of large chunks of land under cultivable barren land is 3.35 percent. The land under quarrying is 1.07 percent. There are some land uses, which are not compatible with the surrounding land uses. Three villages namely Kalher, Purne, and Rahanal have a mixing of residential with the warehousing. Some residential areas have mingled with industrial use creating several problems to the residents in villages Katai, Khoni, Shelar and Karivali. The land values in BSNA are comparatively cheaper than the neighbouring urban centres.

19. Projected population

The population projections for BSNA are based on the following considerations as per the decision of Evaluation Committee meeting held on 6th April, 2009:

I. Population projections in the Regional Plan for MMR, 1996-2011,
II. Population projections by the Chitale Committee Report,
III. Projections of Comprehensive Transport Study of MMRDA,
IV. Effect of overspill population from Kalyan, Thane, Mumbai, Bhiwandi etc, and
V. Primary Census Abstract population figures for the Bhiwandi and BSNA.

By using the Ratio Method, the Regional Plan for MMR, 1996-2011 has projected the population of MMR for the year 2011, which also includes Bhiwandi Sub-region. It was observed that Regional Plan for MMR and Chitale Committee Report, focused on sub-regional level because BSNA was constituted in 2007, hence do not reflect the demographic details and population projections of BSNA. To understand demographic future of BSNA, separate figures of population projections were derived by using the same ratio method, as applied in Regional Plan for MMR, 1996-2011 and simple decadal growth rate computing technique used in Chitale Committee Report.

MMRDA in its report has analyzed declining decadal growth rate of Bhiwandi sub-region that was 87.85 percent in 1981, reduced to 50.46 percent in 2001 and further expected to fall to 36.23 percent by 2011. While agreeing with MMR projections the Chitale Committee has adopted the declining trend in projecting future population. The Committee assumed the growth rate of 46.26 percent in 2001 and predicted the growth rate of 21.80 percent in 2031. On this declining trend, the projected population of BSNA by 2031 would be 3, 69, 934 persons (3.7 Lacs) as per Chitale Committee. However, CDP of BNMC has projected 21 lakhs population for BNMC by 2030. If the averaged 77.87 percent share of BNMC in the BSR population is continued then the anticipated population of BSR would be about 26.00 lakhs by 2030 and the BSNA population will be 5.75 lakhs.

It is worthwhile to mention here that a BNMC population of 21 lakh cannot accommodate itself in about 1240 hectares that gives the density of 1693 (rounded to 1700) persons per hectare or 688 persons per acre. If the town density of 600 persons per hectare assumed for BNMC, the total population that can be accommodated in BNMC will be 14.75 lakhs persons by 2031. Therefore, the remaining population of 6.25 lakhs persons will spill over to BSNA. Thus, the total population of BSNA will be 6.25+5.75=12 lakhs by 2031.

Since BSNA was constituted in 2007, the population projections of different sources referred above have not considered the induced growth. The proposed land uses, development strategies for BSNA and supported by the integrated transportation network shall open up new investment avenues and job opportunities. The new areas of investment could be as under:

i. Industrial Development;
ii. Warehousing and Transportation;
iii. Whole sale and Warehousing;

iv. Commercial Complexes- City Centre and District Centres;

v. Construction Activities- Infrastructure Development;

Once BSNA, the backyard of Mumbai opens up for regulated development it will be a place to accommodate the spillover of the BNMC, Kalyan, Thane or the Mumbai in addition to the inmigration generated by new job opportunities.

The exiting ground realities, factors impacting the future planning including the Regional Plan 2011 have been given due weightage in projecting the future population and land requirements of different land users.

The proposed location of different land uses is guided by the following parameters:

I. Recommendations of the Regional Plan 2011,

II. Predominance of existing land use at a particular location or direction,

III. Associating the support land use in the close proximity for adopting walk-to-work culture without compromising the environmental concerns,

IV. Growth potentials of an activity at a particular location,

V. The transportation network proposed in the Regional Plan 2011,

VI. Suggestions of Lea Associates and emerging growth corridors,

VII. The flooding factor,

VIII. Costal Regulation Zone and eco-sensitive areas, and

IX. Proposals of City Development Plan of BNMC.

20 Proposed Land use Distribution

Based on the considerations mentioned supra, the urbanizable area has been divided into fourteen planning units referred as sectors. Sector wise details are as under:

Sector	Residential	Commercial	Industrial	*Transportation & Communication.	Public Utilities	Pub & Semi Pub	Recreational (Gardens & Play Grounds)	Green Zone (No Development Zone)	Total
A	319.95	7.36	-	0.28	-	30.95	21.42	329.24	**709.2**
B	508.93	14.10	222.13	-	5.38	38.10	111.65	1485.45	**2385.74**
C	271.86	5.26	516.96	-	-	11.78	16.7	42.69	**865.25**
D	282.06	5.30	108.33	-	2.03	20.50	12.42	21.55	**452.19**
E	303.70	4.70	47.20	-	10.83	15.30	16.3	592.25	**990.28**
F	359.69	140.85	75.78	0.60	13.23	23.70	30.37	476.20	**1120.42**
G	167.83	26.10	484.80	-	25.54	9.20	45.11	82.00	**840.58**
H	0.80	13.10	196.50	-	13.90	0.20	80.4	271.10	**576**
I	535.62	146.90	80.10	7.30	3.65	41.20	29.3	20.20	**864.27**
J	460.65	71.20	54.10	18.10	1.84	230.60	152.53	21.46	**1010.48**
K	429.08	8.20	-	6.00	18.8	24.75	307.94	112.96	**907.73**
L	329.34	152.30	551.40	22.10	7.16	16.30	182.84	131.49	**1392.93**
M	80.37	97.43	108.90	8.60	2.01	4.10	0.4	197.46	**499.27**
N	-	128.17	-	15.70	33.30	5.80	27.8	36.10	**246.87**
Total*	**4049.88**	**820.97**	**2446.20**	**78.68**	**137.67**	**472.48**	**1034.18**	**3820.15**	**12860.21**

**353.85 hectares area under NH and Railways make the total 1658.86 hectares under Transportation and Communication and make the total urbanizable area 10620.24 hectares.*

Out of the total 14440.39 hectares of BSNA about 10620.24 hectares are proposed for urbanization under different land use categories. Recognizing the need of rental housing, affordable housing and the role of private sector in housing development the Government of Maharashtra has approved the Rental Housing Policy of MMRDA. The private sector participation in housing investments as measure of resource mobilization is vital to provide affordable housing for attaining quality of life as enshrined in the vision statement.

Area measuring about 4049.88 hectares, including the Gaothan areas and their expansions, is proposed under residential use for a population of 1.2 million persons by 2028 at an average residential density of about 300 (296) persons per hectare. To wipe out the existing backlog of housing for labour, (estimated about one lakh), and to cater to the housing demand of middle and higher income group, residential area has been sub-grouped as Residential-1 (R1), Residential-2 (R2) and Rental Housing (RH).

i. R1 is the sub-group located on the roads less than 30 metres right-of-way where FSI 1.5, including premium of 0.5 is permissible, however, the premium in sub-group B-26 to B-32 of Sector-B in the north of Freeway in continuation of Multi-Modal corridor adjoining the hill forest is not proposed because the area is ecologically fragile and is also the watershed,

II. R2 is the sub-group located on the roads with right-of-way 30 metres and above where FSI 2 with premium of 1.00 is permissible,

III. RH will be permissible as per the applicable Rental Housing Policy of the Government of Maharashtra.

Commercial

Commercial category of land use includes warehouses, merchandise, wholesale market and city centre. The criterion of permissible FSI will be the locational, as applicable in the case of residential, explained as follows:

i. Commercial areas subject to the plot size located on the roads less than 30 metres right-of-way FSI 1.5 including premium of maximum 0.5 is permissible, however, the premium in sub-group B-26 to B-32 of Sector-B in the north of Freeway in continuation of Multi-Modal corridor adjoining the hill forest is not proposed because the area is ecologically fragile and is also the watershed,

ii. Commercial areas subject to the plot size located on the roads with right-of-way 30 metres and above the maximum FSI 2, including premium, is permissible,

iii. However, in the case of warehouses/godowns in the commercial zone FSI for warehouse users shall be limited to 1 within the commercial land use mentioned as (WHS). Existing warehouses cannot avail FSI upto 2 if other commercial use is proposed on these lands after demolishing the existing warehouse/godown on payment of premium (as applicable to commercial land use) subject to plot size and location as mentioned at i. and ii. above.

iv. In City Centre sector N, FSI upto 2 for the entire commercial area is proposed on payment of premium beyond FSI 1.

Industrial

The total area under this land use proposed is about 2446.20 hectares. The existing industrial concentrations adjoining BMNC limits are proposed expansions of the existing and industrial zones in Sectors G, E, and I are for the expansion programs of MIDC. Another category is the theme parks in sector-H measuring about 196.50 hectares. The locational criterion for industrial use is follows:

i. Distribution is guided by the permissions by the government;

ii. Program of the MIDC to expand its industrial base in BSNA;

iii. Areas where permissions granted are for the service industry, including warehousing, the expansion is proposed for the service industry.

iv. General industries including industrial theme parks are industrial.

Accordingly, four groups formed are namely Service Industry (SI), General (I-1), General (I-2) and the theme parks including SEZ (I-3)

Reservations

The reservations are worked out for the total projected population of 12 lakhs for plan period extended upto 2028 instead of 2021 (i.e. ten years).Various reservations are as follows:

Sector	PS	SS	C	CC	FS	PST	D/MH	Lib	TH	PO	H	C/B	EL	TE	Art Complex	Admin	SC	VM	FM	G	PG	LB	STP	WW
A	12	8	1	2	2	2	6	2	2	1	2	-	-	-	-	-	3	2	-	8	13	1	-	-
B	16	13	1	4	2	2	10	2	2	1	3	-	1	-	-	-	5	5	-	6	16		-	-
C	5	3	-	1	2	-	8	1	-	-	-	-	-	-	-	-	-	-	-	5	9	4	-	-
D	8	6	-	1	2	1	6	1	1	1	2	1	-	-	-	-	2	3	1	3	10		1	-
E	7	7	-	1	-	1	7	1	2	1		-	-	-	-	-	3	3	-	5	7	2	-	1
F	9	8	1	1	1	3	7	1	1	2	2	-	-	-	-	-	2	1	-	6	8	3	-	1
G	5	3	-	-	1	-	4	-	-	1	1	1	1	-	-	-	-	-	-	7	6	1	-	1
H	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	1
I	18	13	1	2	3	2	11	2	1	2	1	-	-	-	-	-	2	3	1	9	12	1	1	-
J	11	7		2	1	1	7	1	-	1	1	1	-	-	-	-	1	2	1	7	9	1	-	-
K	78	7	1	1	1	1	4	1	1	1	1	1	-	1	-	-	3	1	-	2	5	5	-	-
L	8	6		3	3	1	8	-	-	1	-	-	-	-	-	-	1	1	-	3	5	5	-	-
M	2	1		1	-	-	4	-	-	1	-	1	-	-	-	-	-	-	-		1	3	1	-
N	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2	1	1		1
Total	**179**	**82**	**5**	**19**	**19**	**14**	**83**	**12**	**10**	**13**	**13**	**5**	**2**	**1**	**1**	**1**	**22**	**21**	**3**	**65**	**103**	**28**	**3**	**5**

**PS – Primary School, SS – Secondary School, C – College, CC – Community Centre, FS – Fire Station, PST – Police Station, D/MH - Dispensary/Maternity Home, Lib. Library, TH- Town Hall, PO – Post Office, H – Hospital, C/B – Cremation/Burial , AC – Art Complex, Admin – Administrative Complex*

21. Transportation Network

For smooth flow of traffic, hierarchy of roads and their nomenclature including interchanges, railway over bridges, under/over passes, in integration with the proposed transport network of CTS pertaining to BSNA is proposed. However, a few changes are suggested in the alignments of Suburban Railways, and the Multi-Modal Corridor in view of the integration of the proposals of the Development Plan.

22. Phasing and Development Strategy

Phasing of various activities is suggested as part of development strategy and for prioritizing the implementation program. Total development cost, on ballpark bases, estimation has been worked out. To give effect to the proposals of the Development Plan and realization of the recoverables, Development Control Regulations have been suggested.

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List of Abbreviations

1.	**AKBSNA**	Ambarnath, Kulgaon-Badlapur and Surrounding Notified Area
2.	**ATP**	Aquifer Performance Test
3.	**BDPO**	Block Development and Panchayat Officer
4.	**BMRPB**	Bombay Metropolitan Region Planning Board
5.	**BNMC**	Bhiwandi Nizampur Municipal Corporation
6.	**BPMC**	Bombay Provincial Municipal Planning Authority Act
7.	**BSNA**	Bhiwandi Surrounding Notified Area
8.	**BSR**	Bhiwandi Sub-Region
9.	**BOT**	Build, Operate and Transfer
10.	**CDP**	City Development Plan
11.	**EIA**	Environment Impact Assessment
12.	**EMS**	Environment Management Strategy
13.	**ETP**	Effluent Treatment Plant
14.	**FM**	Fish Market
15.	**CDP**	City Development Plan
16.	**C & D**	Construction and Demolition Waste
17.	**CIDCO**	City and Industrial Development Corporation Ltd.
18.	**CPCB**	Centre Pollution Control Board
19.	**CRZ**	Costal Regulation Zone
20.	**CTS**	Comprehensive Transport Study
21.	**DCR**	Development Control Regulations
22.	**DDP**	Draft Development Plan
23.	**DFC**	Dedicated Freight Corridor
24.	**DRc**	Development Rights Certificate
25.	**DMP**	Delhi Master Plan
26.	**DMIC**	Delhi Mumbai Industrial Corridor
27.	**EMS**	Environmental Management Strategy
28.	**FSI**	Floor Space Index
29.	**IRBT**	Integrated Rail_Bus Terminus
30.	**ISRO**	Indian Space Research Organisation
31.	**ITDP**	Institute for Transportation and Development Policy
32.	**J/F**	Jetties/ferries
33.	**KDMC**	Kalyan-Dombivli Municipal Corporation
34.	**MCGB**	Municipal Corporation of Greater Bombay
35.	**MHADA**	Maharashtra Housing and Area Development Authority
36.	**MDR**	Major District Road
37.	**MIDC**	Maharashtra Industrial Development Corporation
38.	**MSH**	Major Sate Highway
39.	**MSPCB**	Maharashtra State Pollution Control Board
40.	**MMRDA**	Mumbai Metropolitan Region Development Authority
41.	**MSW**	Municipal Solid Waste
42.	**MMR**	Mumbai Metropolitan Region
43.	**MMRPB**	Mumbai Metropolitan Region Planning Board
44.	**MWSSB**	Maharashtra Water Supply & Sewerage Board's
45.	**(MR and TP Act)**	Maharashtra Regional and Town Planning Act, 1966

46.	**NDZ**	No Development Zone
47.	**NHAI**	National Highway Authority of India
48.	**NOx**	Nitrogen Oxide
49.	**PIA**	Project Implementing Agency
50.	**RH**	Rental Housing
51.	**RoW**	Right of Way
52.	**RP**	Regional Plan
53.	**SC**	Shopping Centre
54.	**SEZ**	Special Economic Zone
55.	**SI**	Service Industry
56.	**SO_2**	Sulfur Dioxide
57.	**SPA**	Special Planning Authority
58.	**STP**	Sewage Treatment Plant
59.	**SWOT**	Strength/Weakness/Opportunity/Threat
60.	**SWM**	Solid Waste Management
61.	**TDR**	Transfer of Development Rights
62.	**TMC**	Thane Municipal Corporation
63.	**UDPFI**	Urban Development Plan Formulation and Implementation Guidelines
64.	**VM**	Vegetable Market
65.	**VVNA**	Virar Vasai Notified Area
66.	**WHS**	Warehousing/Storage
67.	**WW**	Water Works

INTRODUCTION

1. Need for Development Plan

The Regional Plan for Mumbai Metropolitan Region (MMR) prepared by the Mumbai Metropolitan Region Planning Board (MMRPB) came into force in 1973. Although, the Mumbai Metropolitan Regional Planning Board did not suggest any concrete scheme to monitor the plan implementation, it outlined the broad functions and responsibilities of a development authority (BMRPB, 1974). MMRDA constituted in 1975 under the MMRDA Act, 1974 to plan, develop and co-ordinate activities in MMR. MMRDA is the nodal agency for the orderly development of the Mumbai Metropolitan Region. The Urban Development Department, Government of Maharashtra, vide Notification No.TPS 1206/330/CR-230/06/UD-12 dated 17th March 2007 published in Maharashtra Government Gazette dated 19th April 2007, appointed the Mumbai Metropolitan Region Development Authority (MMRDA) as Special Planning Authority under Sub-section(1) of Section 40 of Maharashtra Regional and Town Planning Act, 1966 (MR&TP Act) for the development of 60 villages as Bhiwandi Surrounding Notified Area (BSNA) in an orderly manner. These 60 villages covering an area of 144.39 sq. km. is earmarked for different land uses such as Urbanizable Zones (U-1& U-2), Green Zone, Forest, Recreation and Tourism Zone, etc. as per Regional Plan for Mumbai Metropolitan Region sanctioned in 1999.

2. Past Planning Efforts

The study indicates that the Municipal Council till 1960 made no special planning efforts on a comprehensive scale. Due to rapid expansion of power loom industry, from 1911 onwards there was tremendous inflow of immigrants to the Bhiwandi that increased the pressure on the land, roads and other services available in the town and made the existing roads incapacitated for sustaining the increasing vehicular traffic. The Bhiwandi–Nizampur Municipal Council, in 1960, realized the need of a Development Plan. First development plan of Bhiwandi for the area within municipal limits was prepared and submitted to Government in 1963 for sanction. The Government in 1964 sanctioned the development plan that came into force on 1st. December 1964.

The Municipal Council took up first revision of the sanctioned Development Plan in 1971. The Draft Development Plan prepared by the Town Planning Department was published by Municipal Council under Section 26 (1) of MR&TP Act, 1966 on 5.9.1973 and the notice was published in M.G.G. Part II dated 13.09.1973, on page no. 1867. Observing the legal formalities stipulated in MR&TP Act, 1966, the Municipal Council submitted the Revised Draft Development Plan to the Government for approval on 23.5.1974. The Government accorded the sanction to

the Revised Development Plan vide letter no. TPS/ 1275/306/UD-5/ dated 21.5.1976 and it came into force from 25.6.1976.

3. Objectives of Draft Development Plan

The Development Plan of BSNA (2011-2028) aims at realizing the following objectives:

I. Integrating BSNA with land use activities and networks proposal of MMR, and BNMC,
II. Developing BSNA as Regional Centre to accommodate spill over of Mumbai,
III. Achieving spatial decentralization by developing new growth centers and new transport linkages in the form of mega projects,
IV. Planning and development of sustainable environment to improve habitability of the area by providing infrastructure facilities,
V. To strengthen local economy enhancing growth potentials of BSNA by generating employment in agricultural, industrial, commercial, administrative and transport sector,
VI. Improving the support infrastructure, existing as well as projected requirements, by providing training institutions, transport logistics hubs, marketing and trading centers for textile industry, manufacturing and warehousing,
VII. Preserving and conserving the natural environment.

4. Scope of Preparing the Draft Development Plan

4.1 Data Collection, Review and Analysis

4.1. a Data Collection on the following heads

I. Proposals of earlier sanctioned development plans,
II. Proposals of Coastal Zone Management Plan and Coastal Regulations of the area,
III. Population, employment, economic activities,
IV. Existing physical and social infrastructure,
V. Traffic data on the existing major roads,
VI. Obtaining and compiling data on proposals of various Government Departments,
VII. Environmental considerations,
VIII. Property prices from the ready reckoner,
IX. Existing and proposed land use maps, cadastral maps, topographical maps and high-resolution space imagery.

4.1. b Review and Analysis

The data collected from published and unpublished sources will be collated and the analyzed in terms of cause and implications of the compiled facts.

4.2 Strength/Weakness/Opportunity/Threat (SWOT) Analysis

SWOT analyses based on the findings of various aspects for evaluation of the strengths and weaknesses of the area and providing bases for drafting vision and preparing a Development Plan for the region.

4.3 In Depth Survey

It includes conducting surveys of existing land uses including open lands and built-up areas.

4.4 Mapping

I. Preparing detailed updated base map showing village boundaries of cadastral survey numbers and *hissa* numbers on a scale 1:10,000,

II. Preparing Existing Land Use Map on a scale1:10,000 based on high resolution Quick-bird (MX) Satellite Imageries.

4.5 Preparation of Draft Development Plan for Notified Area with Details as follows:

I. A Land Use Zoning Plan identifying proposals for setting out land use, spatial arrangements of functions and comprehensive development parameters.

II. A Public Facilities Plan identifying proposals and designating land for public purposes.

III. Open Space and Landscape Plan and Strategy incorporating important natural and cultural elements and preparation of integrated Conservation and Open-Space Plan.

IV. A Transportation Plan identifying proposals for transportation and communication development including highways, waterways, canals, etc.

V. An Industrial Development Plan identifying proposals and allocating land for industrial and service related industries within the Notified Area.

VI. A Flood Control Plan identifying existing proposals for flood control and prevention of river pollution.

VII. A Phasing and Implementation Plan for ensuring optimal development within the Notified Area over a time. It includes an examination of various implementation models and selection of an appropriate implementation model to achieve the objectives of the development plan.

4.6 Preparation of Draft Development Control Regulations

To meet the requirement of controlled and regulated development the Development Control Regulations will include:

I. Minimum open space standard;

II. Maximum site coverage;

III. Building height controls;

IV. Character of built –up form;

V. Development density controls;

VI. Control over the use of buildings;

VII. Controls over the sub-division of plots;

VIII. Parking, loading and unloading requirements;

IX. Signage and advertising control regulations etc.

4.7 Preparation of Final Report on the Development Plan for the Notified Area

After a feedback from the Committee setup by MMRDA, the final report on the Development Plan will be prepared and presented.

CHAPTER - I

EVOLUTION OF BHIWANDI AND BSNA

1.1 Nomenclature

Even before the development of Mumbai, Bhiwandi because of its strategic location had been an important trading center. During Mughals' rule, Bhiwandi was known as Bhimbari. It is believed that a saint Sheikh Hussain Kadri from Baghdad came to Bijapur on the day the king of Bijapur Ali Adilshah Baddashah expired. At that time, Bhiwandi area was under the influence of Portuguese who had driven out a king named Bhim. The saint helped Bhim in recovering his lost territory from the Portuguese. As a token of gratitude, Sheikh Hussain Kadri was made a Minister of Bijapur and Bhimbari started to be known as "Bhimadi Islamabad". The place got its present name "Bhiwandi" in the British period. *(City Development Plan for Bhiwandi-Nizampur city, 2005-2030).*

1.2 Locational Advantages

Bhiwandi, located in the east of Sahyadri mountain ranges, belongs to the North Konkan region of Maharashtra in the Konkan coastal lowlands. The average elevation is 24 m above msl. The Bhiwandi Surrounding Notified Area is situated between 19° 12' 07" N to 19° 21' 50" N latitude and 72° 59' 48" E to 73° 7' 50" E longitude is a part of the Mumbai Metropolitan Region. *(Environment Status Report Bhiwandi, 2004-05)*. The development potentials of this site are due to its nearness to Thane and the metropolis of Mumbai. It is located at 16 kms from District Thane and 10 kms from Kalyan. It is linked to Thane and Mumbai through Bombay-Agra National Highway No.3, Vasai and Kalyan through State Highway and the railway line from Vasai-Diva. Due to its nearness to Mumbai city and transportation network, the godowns and warehouses are located here and the city is famous for both handlooms and power looms.

Hills, ridges and forests in the north, east and northwest mark the boundary of BSNA. The Ulhas River demarcates its southern boundary. Due to natural hard and soft high-rise and low-lying features, BSNA has saucer type topography. Therefore, some pockets of land in BSNA remain under swampy conditions caused by the backlash of marine waters and resultant inundation of Thane creek, Bassein creek and other minor inlets ingressing the landmass. Agriculture in the area suffers from the presence of marine water and poor drainage and Irrigation facilities.

1.3 Evolution

Bhiwandi town came under British hands in 1817 as an army camp. In 1650, Bhiwandi is mentioned as a place of trade with Gujarat. In 1652, in a treaty with Portuguese, the rulers of Ahmednagar agreed not to allow pirates to pass by Kalyan and Bhiwandi to Vasai. An ancient temple dedicated to Varhala Devi is located near the Varhala tank that supplies water to the city. At village Kambe, the small ruined fort with two bastions is one of a line of forts that guarded the border between Portuguese Bassein and the Maratha Bhiwandi. *(City Development Plan for Bhiwandi-Nizampur city, 2005-2030).*

The region was called Kolwan and its inhabitants were called Kolis. In the past, Bhiwandi was a main port between Nanghat and Bhorghat exporting oil, cotton, rice and salt to ports around the world. This area is also famous for its weaving and hand-made saris. It also has a naval base *(Environment Status Report Bhiwandi, 2004-05).*

During ordinary tides, boats upto 20 tons and in spring tides, upto 42 tons can reach the town. Its position on a navigable stream on the direct line of traffic through the Thal Pass must have made Bhiwandi an early trade center used by the Britishers for trade and commerce purposes. The Britishers also established the old military dispensary, which at present houses the Subordinate Judge's Court. The Tansa Dam also was developed during the British period for supply of water to Thane and Mumbai. The railway line, *known as Central Railway line,* now abandoned, was laid down from Tansa Dam to Mumbai and water supply pipelines from Tansa Dam to Thane and Mumbai were laid down on both sides of the Central Railway line. With the inception of Tansa water supply pipelines, the city also got fresh water for drinking purposes.

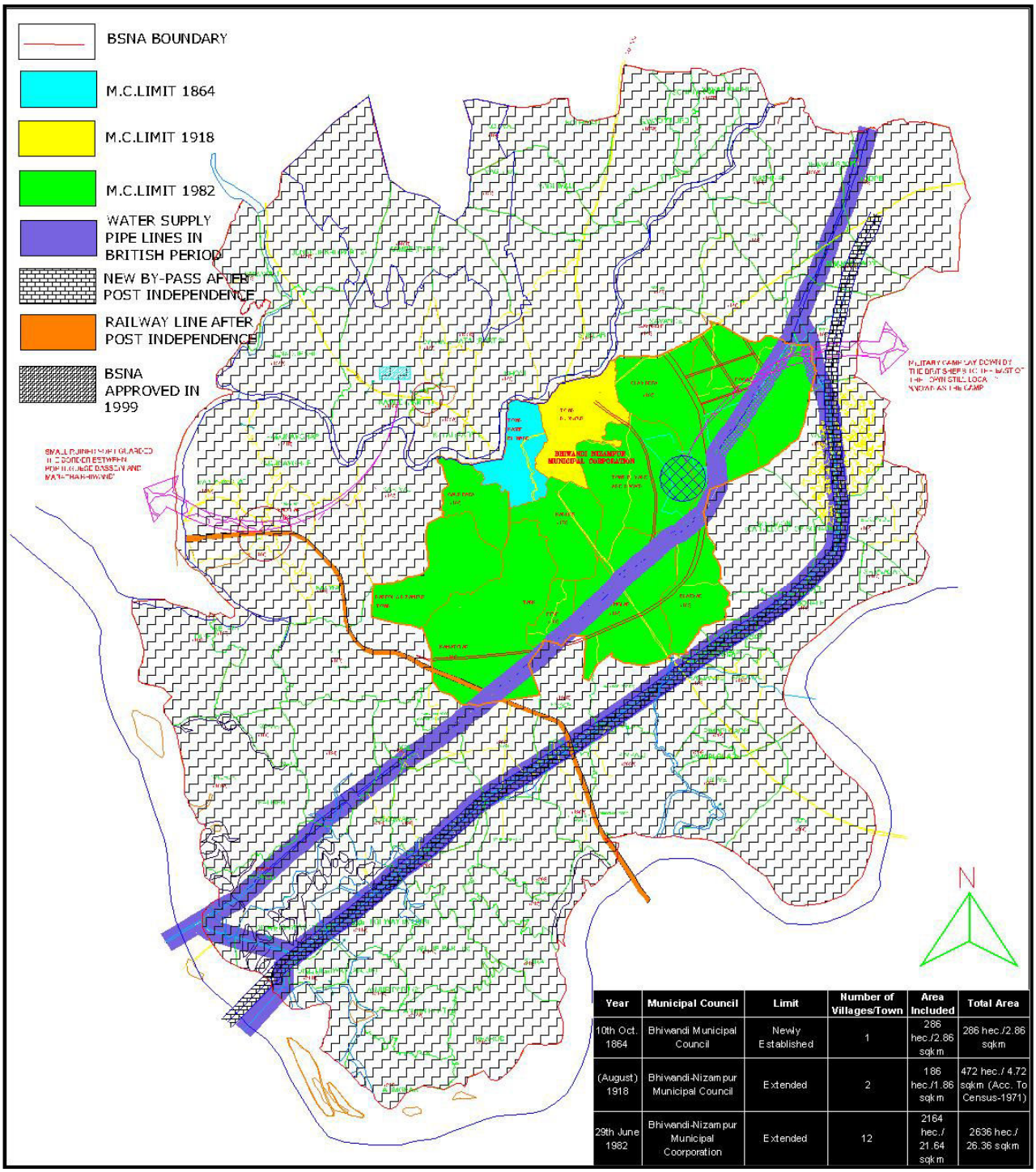
Since, military camp was established at Bhiwandi the Britishers also set up in the town handloom industry for weaving cloth for uniforms and general wear of the corps. The Britishers in the town also introduced the electricity supply. During post-independence period, Bhiwandi emerged as an important center of textile industry producing about one fourth of India's grey cloth. It is also a center of production and trading of plastic beads and crystals. After the introduction of octroi for entering Thane, warehousing and transport activities developed at a fast pace making it.

The railway link on Central Railway route between Diva and Vasai on the Western Railway passing through Bhiwandi was laid down after Independence. Yarn and wood are important commodities imported in the town while it exports power looms, rice and rice mill and other machinery. The most important commodities manufactured in the town are carts, rice and power-loom clothes. The city Bhiwandi, known for its textile industry, has the largest number of

power looms in the country and sometimes called as 'The Manchester of India' (Figure 1.1). *(Environment Status Report Bhiwandi, 2004-05).*

The development of the town has also influenced the economy growth BSNA villages namely, Shelar, Katai, Karivali, Khoni and Kon that emerged as Census towns in 2001.

Figure1.1 BSNA: Historical Evolution



Year	Municipal Council	Limit	Number of Villages/Town	Area Included	Total Area
10th Oct. 1864	Bhiwandi Municipal Council	Newly Established	1	286 hec./2.86 sqkm	286 hec./2.86 sqkm
(August) 1918	Bhiwandi-Nizampur Municipal Council	Extended	2	186 hec./1.86 sqkm	472 hec./ 4.72 sqkm (Acc. To Census-1971)
29th June 1982	Bhiwandi-Nizampur Municipal Coorporation	Extended	12	2164 hec./ 21.64 sqkm	2636 hec./ 26.36 sqkm

1.4 Establishment of Bhiwandi-Nizampur Municipal Corporation (BNMC)

Bhiwandi-Nizampur is situated at the northern threshold of the New Bombay and Kalyan Metropolis and has been identified as one of the growth centers in the Mumbai Regional plan. This industrial center is connected with Thane Corporation and New Mumbai by the National Highway i.e. Bombay- Agra road passing through the town. It is connected with Kalyan, Vasai-Virar, and Wada by the State Highways generating form the town. An outline zone plan has been prepared for this area in 1973 along with the Regional Plan.

Bhiwandi Municipal Council was established on 10th October 1864 covering only Bhiwandi city having an area of 2.86 sq km. In August 1918, its municipal limits were extended to include village Nizampur in the eastern side of Bhiwandi city having an area of 1.86 sq km. Since then, it is called as Bhiwandi-Nizampur Municipal Council. In 1982, the Government of Maharashtra included 10 more surrounding villages namely Gauripada, Narpoli, Nagaon, Chavindra, Bhadvad, Fene, Kaneri, Kamatghar, Pogaon, Temghar having an area of 21.64 sq km within Bhiwandi-Nizampur Municipal Area. The total area in BNMC increased to 26.36 sq km. presently the municipal limit includes 12 villages namely Bhiwandi, Nizampur, Gauripada, Narpoli, Nagaon, Chavindra, Bhadvad, Fene, Kaneri, Kamatghar, Pogaon and Temghar. *(Draft Development Plan (Revised) Bhiwandi-Nizampur, August 1993).*

1.5 Establishment of Bhiwandi Surrounding Notified Area (BSNA)

The Urban Development Department, Government of Maharashtra, by Notification No.TPS 1206/330/CR-230/06/UD-12, dt.17th march 2007 published in Maharashtra Government Gazette dated 19th April, appointed the Mumbai Metropolitan Region Development Authority (MMRDA) as the 'Special Planning Authority' (SPA) under Sub section (1) of Section 40 of the Maharashtra Regional and Town Planning Act, 1966 for the development of the area of 60 villages known as Bhiwandi Surrounding Notified Area (BSNA), in Bhiwandi Taluka of Thane district. These 60 villages form part of the Regional Plan (RP) for Mumbai Metropolitan Region sanctioned in 1999. The notified area surrounds the Bhiwandi-Nizampur Municipal Corporation. *(Terms of Reference for the Preparation of Development Plan (DP), 2008).*

1.6 Summary

The study reveals that the BSNA has an important location. The area is largely bounded by natural features viz., Ulhas River, Thane Creek on the southwest, southeast and southern side and hard natural features like hills and ridges on east, northwest and northern side. Mughals and Portuguese ruled over Bhiwandi. They built tomb, forts, temples and created water bodies in the area. They used this region trading with Gujarat and other states of the country. Under the influence of the Mughals and Portuguese, the Muslim population concentrated in the region and village named Nizampur came into existence on the eastern side of Bhiwandi city.

The Britishers took over the control of Bhiwandi in 1817 and used the area as a trade center and Army Camp. They also laid down water supply pipelines and Central Railway line. They set up Military Dispensary, electric sub-station and handlooms and power looms in the area. They built Tansa Dam to meet the water requirements of Mumbai and Thane. The transportation linkages also developed during this period. With better water facilities, improved

transportation linkages and establishment of handlooms and power looms, the area started developing gradually. During mid 1860's the Bhiwandi Municipal Council came into existence.

With the rapid development of power looms and handloom, units after independence migrant labor from Uttar Pradesh, Bihar, Hyderabad, and other parts of the country came to the region for employment. Gradually, Bhiwandi became the leading producer and supplier of cotton cloth in the country. In addition, due to the nearness to Mumbai and Thane and the availability of cheap land or rent, godowns and warehouses started developing along the old Agra Road. The Rail connection between Vasai and Diva serving Bhiwandi further promoted the development of godowns/warehouses and textile units in Bhiwandi and BSNA.

CHAPTER - II
REGIONAL SETTING

2.1 Introduction

Regional setting is a combination of region and setting. Region means an area and setting means how the area positioned in its surroundings. Regional setting is studied in order to determine the location of a particular area with respect to the region, which includes physical linkages such as road and rail network, the surrounding villages with which it has a mutual interaction and the countryside, which would become part of the city in near future (Figure2.2).

2.2 Location

Located to the east of Sahyadri ranges, Bhiwandi and Surrounding Notified Area fall in the North Konkan region of Maharashtra. It stretches between 19° 12' 07" N to 19° 21' 50" N latitude and 72° 59' 48" E to 73° 7' 50" E longitude. BSNA is a part of the Mumbai Metropolitan Region. Bhiwandi city forms the heart of BSNA and is only12 km away from Kalyan and 16 km from Thane city. Kalyan city shares its eastern boundary with Kon village of BSNA and Dive Anjur and Kasheli villages with Thane city in western part separated by Ulhas river.

2.3 Preparation of Base Map and Mapping Constraints

BSNA comprises of 60 villages (Table.2.1) has an area of 144.40 sq. km. The boundary of BSNA has been demarcated based on the boundary of constituent villages. While preparing the updated base map of Bhiwandi Surrounding Notified Area, the outline boundaries of all 60 constituent villages were updated from government approved 60 cadastral village maps showing survey numbers available with the Sub –Regional Office, MMRDA (Figure2.1). The raster image was for every revenue village vectorised and conjoined. While mosaicing the vector layers of individual cadastral images, the median line of the two adjoining villages was drawn, thereby obliterating the outline boundaries of adjacent villages. This has been facilitated for edge matching and shape maintenance of adjacent villages. Some other relevant adjustments made during the process are reproduced below for further reference and in Annexure-I.

Fig 2.1: BSNA-Constituent villages

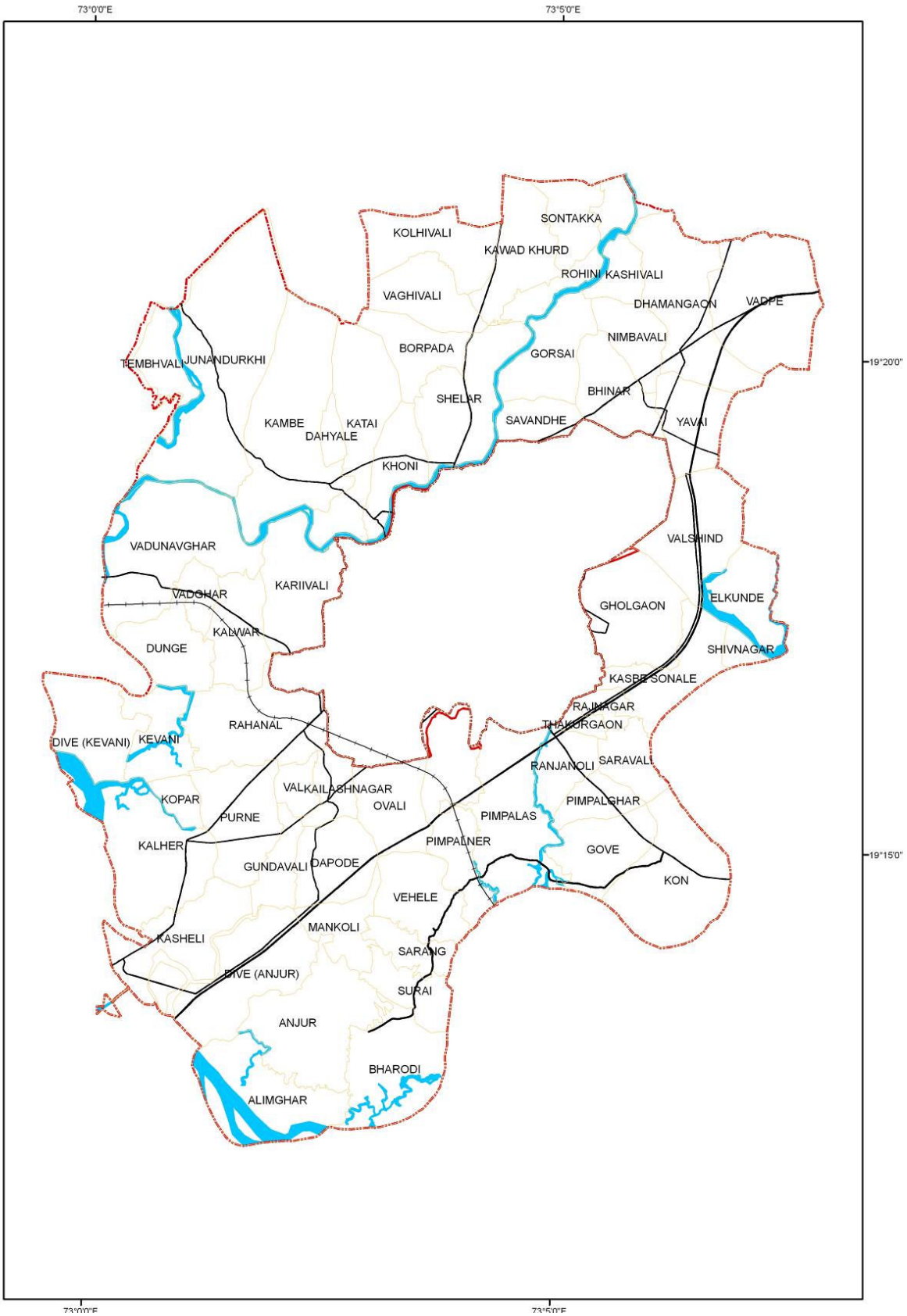


Table 2.1: Constituent Villages in BSNA as Per Gazette Notification of Land Records

Sr. No	Name of Village	Sr. No	Name of Village	Sr. No	Name of Village
1	Alimghar	21	Kambe	41	Ranjnoli
2	Anjur	22	Kasheli	42	Rohini
3	Bharodi	23	Kashivali	43	Sarang
4	Bhinar	24	Katai	44	Saravali
5	Borpada	25	Kawad Khurd	45	Savandhe
6	Dahyale	26	Kevani	46	Shelar
7	Dapode	27	Karivali	47	Shivnagar
8	Dhamangaon	28	Khoni	48	Sonale (Kasbe)
9	Dive- Anjur	29	Kolhivali	49	Sontakka
10	Dive (Kevani)	30	Kon	50	Surai
11	Dunge	31	Kopar	51	Tembhvali
12	Elkunde	32	Mankoli	52	Thakurgaon
13	Gundavali	33	Nimbavali	53	Vadpe
14	Gholgaon	34	Ovali	54	Vadghar
15	Gorsai	35	Pimpalghar	55	Vadunavghar
16	Gove	36	Pimpalas	56	Vaghivali
17	Junandurkhi	37	Pimpalner	57	Val
18	Kailashnagar	38	Purne	58	Vehele
19	Kalher	39	Rahanal	59	Valshind
20	Kalwar	40	Rajnagar	60	Yavai

2.4 Physical Linkages

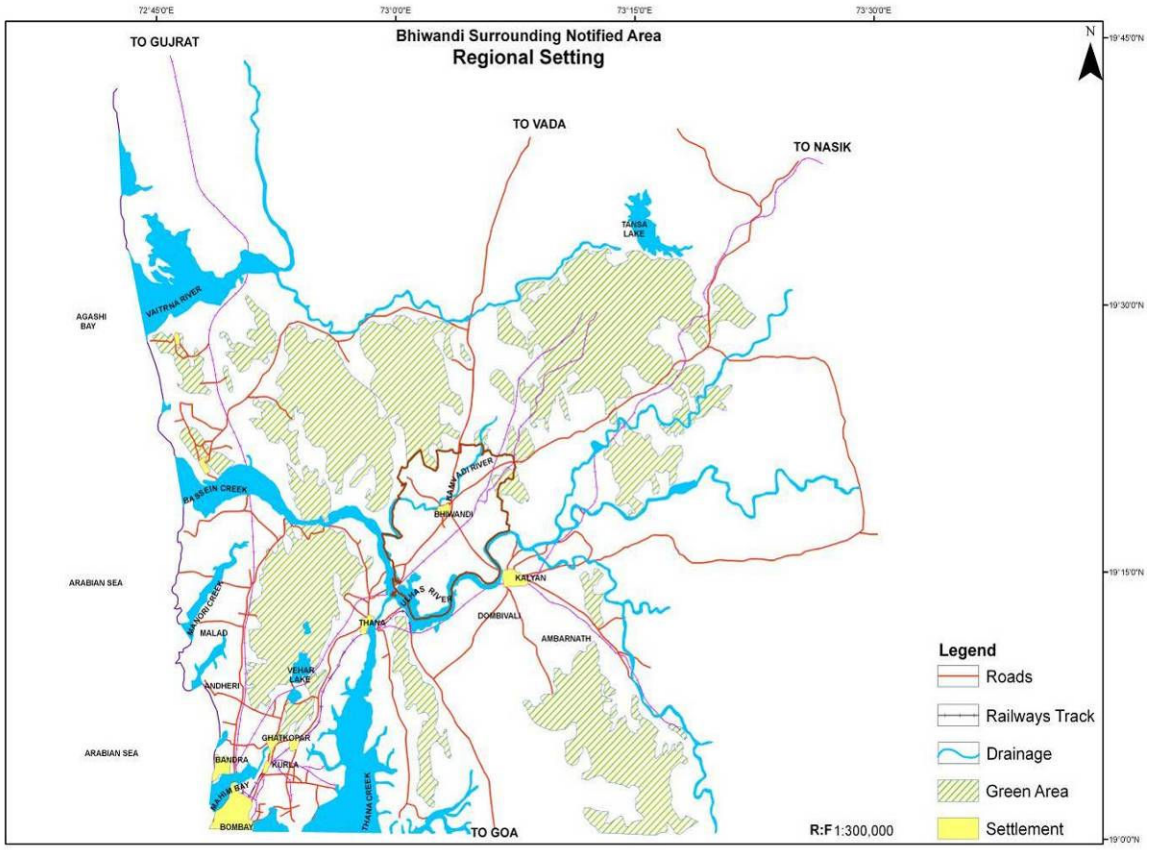
BSNA is linked with other parts of the Thane district and State as well by Bombay-Agra National Highway (NH-3), Kalyan-Bhiwandi Highway, Bhiwandi-Vada State Highway and other roads.

The new alignment of National Highway No. 3 bypasses Bhiwandi city through villages of BSNA namely Dive, Kasheli, Dive Anjur, Mankoli, Dapode, Ovali, Pimpalner, Pimpalas, Ranjnoli, Saravali, Sonale, Valshind, Yavai, Dhamangaon and Vadpe. Kalyan-Bhiwandi Highway passes through the villages of Ranjnoli, Pimpalghar, Gove and Kon and links BSNA with Kalyan. At present Kalyan and Bhiwandi are the nearest railway stations for BSNA villages. The southwest part of BSNA is also connected by rail link between Diva on the Central Railway and Vasai by the Western Railway. The railway line passes through the villages of Pimpalner, Ovali, Rahanal, Kalwar, Vadghar and Vadunavghar. The Bhiwandi-Vada state highway originates from Bhiwandi and leads to Vada through the villages of Shelar, Vaghivali, Kawadkhurd and Kohlivali.

2.5 Major Settlements in Close Proximity

The district headquarters Thane and Kalyan Urban Agglomeration share boundaries with BSNA. Thane has a total population of 14.65 lakh (2001) and Kalyan has a total population of 13.68 lakh (2001). Thane city as the district headquarters performs administrative functions. It is also a centripetal force for the population residing in BSNA. Kalyan is another important settlement, having rice mills and factories making car spare parts.

Figure 2.2: BSNA- Regional Setting



2.6 Summary

BSNA, located to the east of Sahyadri mountain ranges forms a part of the North-Konkan region of Maharashtra. It is surrounded by two metropolitan settlements namely Thane (Administrative Headquarter) and Kalyan. The BSNA has good connectivity with the surrounding settlements through National Highways and State Highways crisscrossing the area. The southwestern part of BSNA is connected by rail link between Diva on the Central Railways and Vasai on the Western Railways.

It may be noted here that the BSNA has good road linkages to the major settlements but still lacks efficient connectivity to cater to the demands of the passengers and goods flow. It lacks suburban rail link, which is the major source of transportation of the people in the Mumbai Metropolitan Region. The brief analysis of regional setting of BSNA indicates that the area criss crossed by major roads connecting metropolitan cities has the potential to grow and accommodate the over-spill of surrounding cities due to the availability of land.

CHAPTER - III

PHYSICAL SETTING

3.1 Relief Structure

3.1.1 District Level

Thane district forms a part of the Maharashtra Littoral. It has a long coastline with a number of creeks and inlets. The general appearance of the coast is submerged as seen from low tidal flats, tidal marshes, tidal inlets and presence of numerous rocky islands and wave cut platforms.

The district generally slopes to the west towards the Arabian Sea. It forms an important part of traditional 'Konkan Plain'. Ruggedness and uneven topography are the major features of physiography. The Sahyadri Range and its offshoots comprise the main hill system of the district. From the steep scarps of the Sahyadri in the east, the land of the district falls through a succession of plateaus in the north and center and to the Ulhas basin in the south. These lowlands are separated from the coastal region in the west by a fairly well defined narrow ridge of hills comprising Konkan hills, Jayshet hills and the Tungar hills that run north to south.

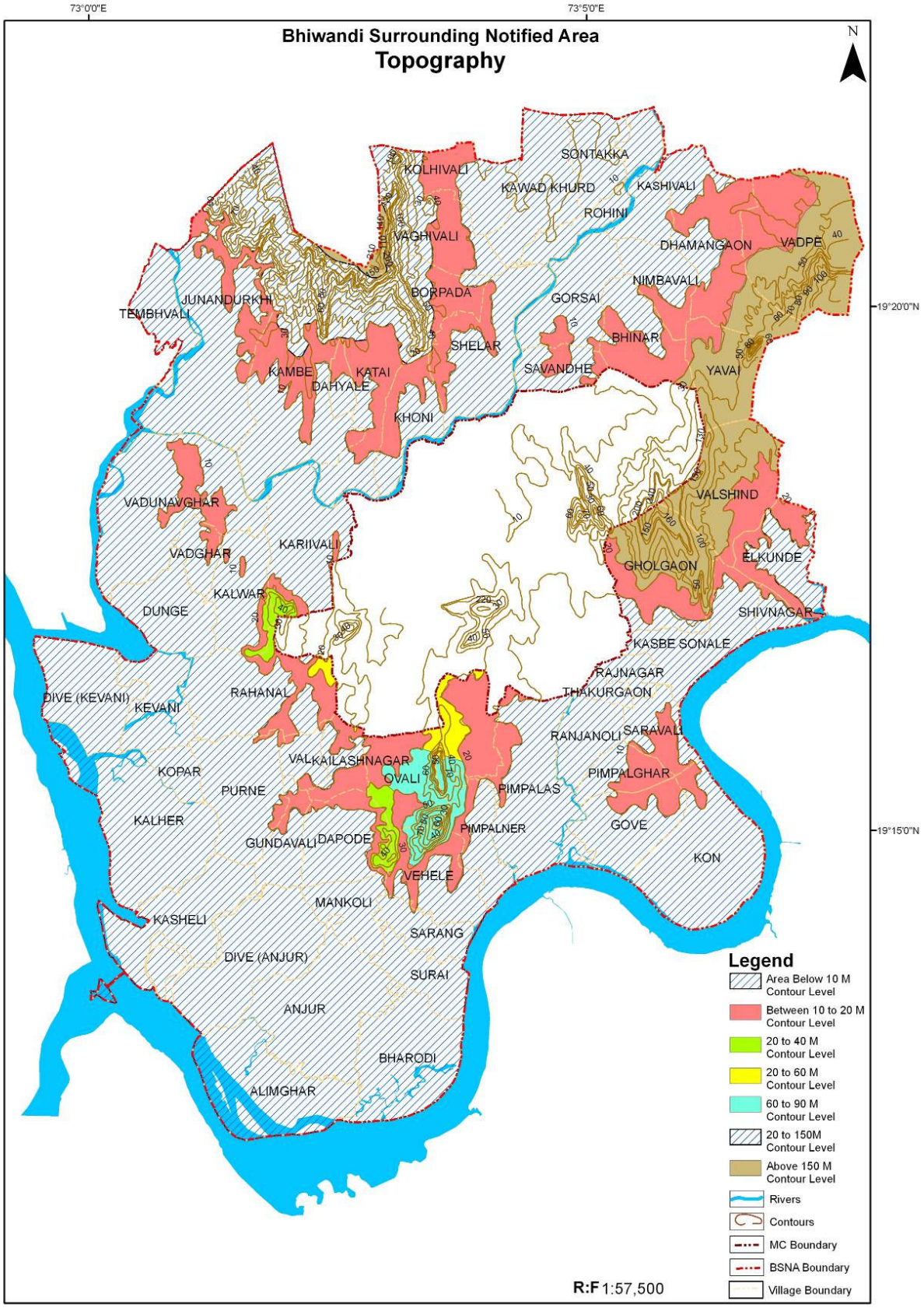
On the basis of soils, geology, relief, drainage and climate, the district has been divided into Twelve (12) sub-micro regions namely (1) Thane Coast; (2) Konkan Hills; (3) Talasari Plateau; (4) Sahyadri Hills; (5) Mokhada Plateau; (6) Shahapur Plateau; (7) Vaitarna Valley; (8) Jayshet Hills ; (9) Tansa Valley; (10) Tungar Hills; (11) Ulhas Basin; and (12) Konkan Forested Hills.

The region covered under BSNA falls in the Ulhas Basin. This micro- region slopes towards the west and is drained by river Ulhas and its tributaries. The Ulhas River is tidal for a considerable distance of about 68 kms. An interesting and economically important feature of the Ulhas drainage is that it receives the tail waters of Bhivapuri Hydel System, and this regulated flow of water is capable of agricultural and industrial utilization.

3.1.2 BSNA Level

The relief structure of BSNA is representative of the topographical conditions of Ulhas basin sub-micro region. It has high-rise and low-lying levels, such as hills, ridges and plains making the topography rugged and uneven. The elevation ranges between 10m contour to the highest 280m in Bhiwandi Surrounding Notified Area (Figure 3.1). It is evident from the map that nearly half (49%) of BSNA falls within 10m above mean sea level. The villages located below 10m contour level include - Alimghar, Bharodi, Anjur, Dive Anjur, Kasheli, Mankoli, Surai, Sarang, Gundavali, Kalher, Kopar, Rahanal, Kevani, Kalwar, Dunge, Karivali, Tembhvali, Savandhe, Kashivali, Shivnagar, Sonale, Ranjnoli, Pimpalgaon, Pimpalghar, Kon, Pimpalas, Purne, Dive, Gove, Saravali, Gorsai, Shelar and Khoni. The total geographical area with less than 10m elevation is about 83 sq km.

Figure 3.1: BSNA-Topography



Hills and ridges mark the northeast, northwest and northern side of BSNA with elevation ranging from 150m to 280 m. A small contiguous belt from northeast to south of the area has contour range from 60m to 280m that divides the drainage network of BSNA into four micro sub-water sheds.

3.2 Drainage and Slope

Kamvadi and the Ulhas Rivers drain the BSNA. The Kamvadi flows from northeast to northwest passing through the heart of BSNA. The Ulhas River demarcates the southern boundary of BSNA but has a direct influence on the economy of BSNA. There is a creek between Kon, Gove, Pimpalas and Pimpalghar villages due to the backlash effect of the Ulhas River. The presence of some small water bodies between Alimghar and Anjur villages and Dive Highway may be attributed to their nearness to Ulhas River. Due to the hills, ridges, and varying contour levels in the area, the drainage pattern of the area is divided into four zones i.e. northwest, southeast, southwest and northeast (Figure 3.2). *Table 3.1* shows name villages sloping towards Northwest, Southeast, Southwest and Northeast directions.

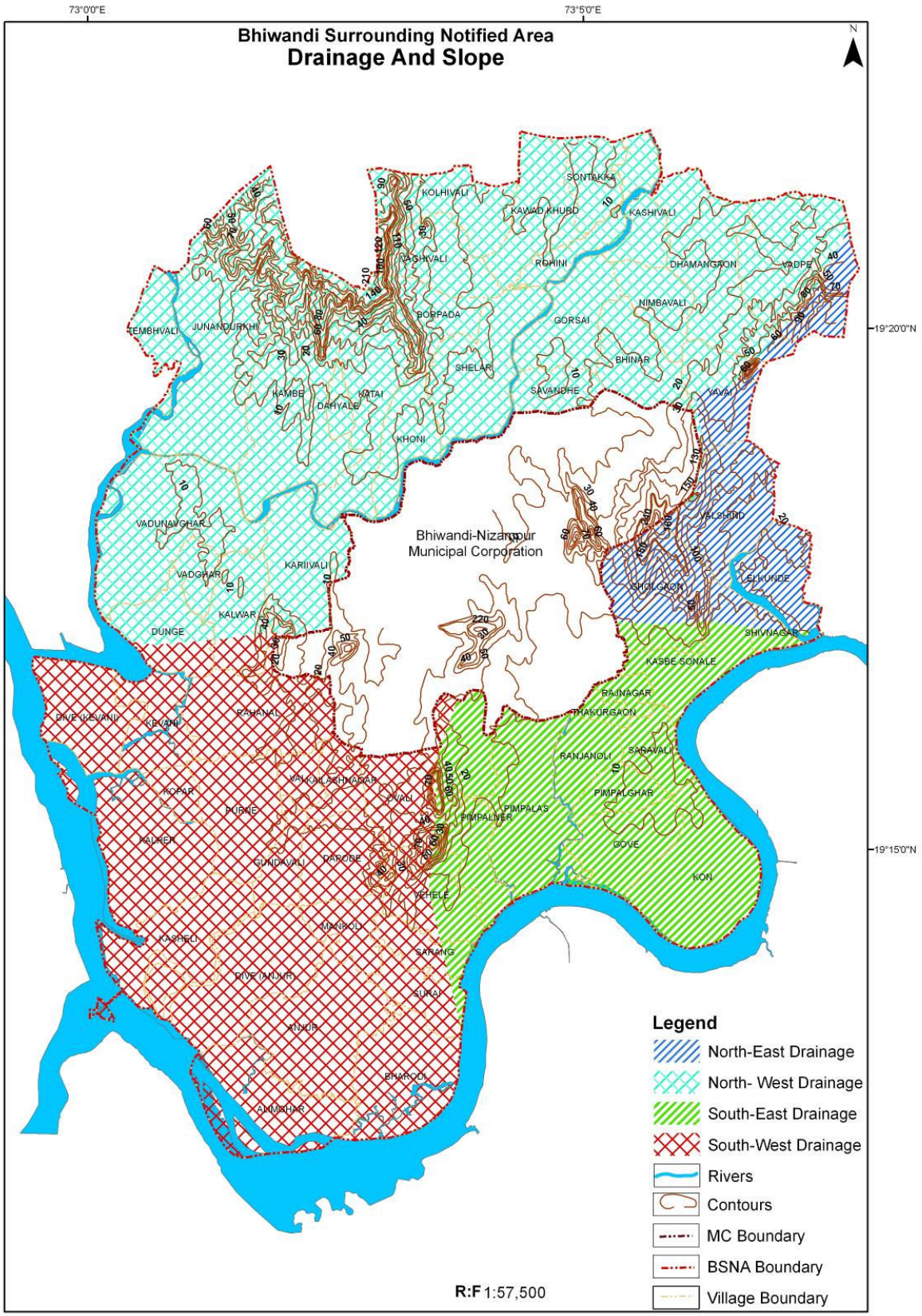
Table 3.1: BSNA- Village-Wise Slope

Slope	Name of Villages
North-West	Vadghar, Vadunavghar, Karivali, Kambe, Katai, Junandurkhi, Dahyale, Khoni, Tembhvali, Shelar, Borpada, Vaghivali, Kolhivali, Kawad Khurd, Sontakka, Rohini, Kashivali, Dhamangaon, Nimbavali, Gorsai, Bhinar, Savandhe, Yavai (part) and Vadpe (part)
South-East	Pimpalner, Pimpalas, Pimpalghar, Ranjnoli, Thakurgaon, Sonale Kasabe, Shivnagar, Saravali, Gove, and Kon
South-West	Alimghar, Bharodi, Sarang, Surai, Vehele, Dapode, Gundavali, Ovali, Val, Kalher, Kalwar, Kopar, Dunge, Purne, Rahanal, Dive Kevani, Kasheli, Mankoli, Dive Anjur and Anjur.
North-East	Valshind, Elkunde, Gholgaon and parts of Yavai and Vadpe

Source: Computed from Map 3.2

The BSNA is prone to floods due to the poor drainage, low-lying areas, creeks, minor inlet, and water bodies. Record-Breaking Rainfall in July 2005 witnessed a flooding of Bhiwandi and surroundings areas not only dislocating normal functioning but also taking a heavy toll on industry. The flooding also severely damaged more than 2.50 lakh power looms with an estimated loss of Rs 600 crores including damage to machinery and accessories and goods in godowns. (Environment Status Report Bhiwandi, 2004-05). The villages flooded by Kamvadi river are Shelar, Karivali, Khoni, Gorsai, and Savandhe and by Ulhas are Kon, Saravali, Sonale, Pimpalas, Pimpalner, Vehele, Anjur, Dive Anjur, Alimghar, Mankoli (Irrigation Department)

Figure 3.2: BSNA-Drainage and Slope



3.3 Climate

BSNA partake climate of its district that is tropical humid experiencing small diurnal and seasonal temperature variations. The district receives high rainfall under the influence of southwest monsoon but this is not uniform. The rainfall increases from the coast towards the Sahyadri in the east. In the coastal strip, the rainfall decreases from south to north. In association with cyclonic storms in the Arabian Sea, in the post monsoon months and to a lesser extent in May, the district experiences torrential rains and strong winds sometimes reaching gale force, particularly in the coastal region.

3.3.1 Temperature

The summer season extending from March to June is generally warm with mean maximum temperature of 32.3^0 C. The cold months are December, January and February with a mean minimum temperature of 16-20^{0}C. The maximum and minimum temperatures from 2003-2007 are shown in *Table 3.2*

Table 3.2: Month-wise Maximum and Minimum Temperature in ^{0}C (2003 to 2007)

Months	2003		2004		2005		2006		2007	
	Mean		Mean		Mean		Mean		Mean	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	33.8	18.3	34.9	20.5	32.0	18.5	31.5	18.5	30.5	15.4
Feb.	30.4	19.8	34.9	25.6	34.5	19.4	30.5	14.2	31.6	19.5
March	31.3	20.8	30.2	17.9	34.9	20.5	31.4	20.5	34.6	20.5
April	33.6	20.6	34.2	32.5	37.5	24.8	32.5	23.5	37.5	23.5
May	34.7	19.5	30.5	28.9	30.5	25.4	33.4	26.5	39.4	24.8
June	30.7	23.5	30.4	16.5	31.5	23.8	34.5	27.5	34.8	26.4
July	30.4	22.6	32.5	21.8	39.1	22.7	31.6	24.5	34.8	21.5
Aug.	31.6	20.5	24.5	32.5	37.3	22.9	30.4	24.6	34.5	24.3
Sep.	31.0	24.5	28.4	25.9	34.2	24.8	36.5	26.4	34.8	24.5
Oct.	33.1	16.2	32.5	24.6	25.9	20.4	35.2	25.9	31.9	20.6
Nov.	33.4	22.5	35.2	24.9	34.4	22.2	34.5	21.5	32.5	24.8
Dec.	34.5	23.6	30.8	19.5	29.4	19.5	35.8	19.5	34.7	24.8
Total	388.5	252.4	379	291.1	401.2	264.9	397.8	273.1	411.6	270.6

Source: Meteorological Department

It is evident from Table 3.2 that maximum temperature has experienced minimum fluctuation between 2003 and 2007. It varied from 24.5^{0}C in 2004 to 39.1^{0}C in 2005 and 39.7 in 2007. In contrast, the minimum temperature fluctuated between 14.2^{0}C in 2006 to 32.5^{0}C in 2004.

3.3.2. Rainfall Amount and Distribution

The rainy season generally commences before the middle of June and lasts up to the first week of October. Table 3.3 reveals that the 20 years (1988-2007) mean annual rainfall of Bhiwandi was 2490 mm with a maximum of 4211 in 1993 followed by 3989 mm in 2004 with a minimum of 778.8 mm in 1995. The months of July and August receive maximum rainfall from southwest monsoons. The coefficient of variation of rainfall from normal is 20 to 30 percent. The vicinity of BSNA has shown a falling trend of rainfall from 1988 to 2007.

Table 3.3: Monthly Rainfall (mm) Recorded at Bhiwandi (1988-2007)

Years	Months of the Year												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
1988	0.0	0.0	0.0	0.0	0.0	434.9	1226.1	291.7	628	251.4	0.0	0.0	2832
1989	2.1	0.0	0.0	0.0	0.0	441.3	943.6	663.6	191	78.7	0.0	0.0	2318
1990	0.0	0.0	0.0	0.0	0.0	873.0	779.0	486.0	206.0	120.0	39.0	0.0	2503
1991	0.0	0.0	0.0	0.0	0.0	603.0	999.0	671.0	27.0	0.0	0.0	0.0	2300
1992	0.0	0.0	0.0	0.0	0.0	246.0	555.0	1125.0	400.0	84.0	0.0	0.0	2410
1993	0.0	0.0	0.0	0.0	0.0	316.0	1484.0	1945.0	466.0	0.0	0.0	0.0	4211
1994	0.0	0.0	0.0	0.0	0.0	362.0	1383.0	772.0	376.0	0.0	0.0	0.0	2893
1995	0.0	0.0	0.0	0.0	0.0	69.8	0.0	364.0	216.0	129.0	0.0	0.0	778.8
1996	0.0	0.0	0.0	0.0	0.0	351.0	1062.0	522.0	410.0	0.0	0.0	0.0	2345
1997	0.0	0.0	0.0	0.0	0.0	468.0	1394.0	481.0	898.0	0.0	0.0	0.0	3241
1998	0.0	0.0	0.0	0.0	0.0	450.0	822.0	804.0	280.0	42.0	0.0	0.0	2398
1999	0.0	0.0	0.0	0.0	0.0	447.0	738.0	192.0	90.0	55.0	0.0	0.0	1522
2000	0.0	0.0	0.0	0.0	174.0	216.0	738.0	686.0	110.0	0.0	0.0	0.0	1750
2001	0.0	0.0	0.0	0.0	0.0	539.0	738.0	899.0	172.0	29.0	0.0	0.0	2377
2002	0.0	0.0	0.0	0.0	0.0	901.0	220.0	562.0	283.0	15.0	0.0	0.0	1981
2003	0.0	0.0	0.0	0.0	0.0	670.0	791.0	0.0	154.0	58.4	0.0	0.0	1673
2004	0.0	0.0	0.0	0.0	0.0	410.0	748.0	1070.0	676.0	1085	0.0	0.0	3989
2005	0.0	0.0	0.0	0.0	0.0	634.6	1602.3	662.0	199.9	0.0	0.0	0.0	3099
2006	0.0	0.0	0.0	0.0	0.0	497.6	1126.9	954.0	495.0	0.0	0.0	0.0	3074
2007	0.0	0.0	0.0	0.0	0.0	544.0	704.0	856.0	0.0	0.0	0.0	0.0	2104
Total	2.1	0.0	0.0	0.0	174.0	9474	18054	14006	6278	1948	39.0	0.0	49799
Average	0.1	0	0	0	9	474	903	700	314	97	2	0	2490.0

Source: Ground Water Survey and Development Agency, Thane and Indian Meteorological Department

It is evident from Table 3.4 that rainy days are spread from 41 to 96 days during monsoon season. A minimum of 41 days during 2003 and a maximum of 96 days during 1988 were recorded. On an average, 62 rainy days were recorded during 1988 to 2007. Sometimes 20 to 30% of mean annual rainfall is received just in 3 to 4 days (*Ground Water Development Authority, Thane district*). Such heavy rains make significant contributions in filling the water G21

reservoirs that provide water supply to Mumbai Municipal Corporation. The dry spells are equally severe. Occasionally, rainfall is delayed for days together even during rainy season.

Table 3.4: Month-wise Rainy Days (1988 - 2007)

Year	1	2	3	4	5	6	7	8	9	10	11	12	Total
1988	00	00	00	00	00	17	27	24	25	03	00	00	96
1989	00	00	00	00	00	18	24	23	13	03	00	00	81
1990	00	01	01	00	05	13	23	27	21	06	00	00	97
1991	00	00	00	00	00	10	26	26	06	00	00	00	68
1992	00	00	00	00	00	09	22	24	12	03	00	00	70
1993	00	00	00	00	00	09	24	26	10	00	00	00	69
1994	00	00	00	00	00	09	22	15	09	00	00	00	55
1995	00	00	00	00	00	05	00	09	08	08	00	00	30
1996	00	00	00	00	00	09	20	13	11	00	00	00	83
1997	00	00	00	00	00	10	22	12	15	00	00	00	59
1998	00	00	00	00	00	10	21	22	08	05	00	00	66
1999	00	00	00	00	00	11	21	08	07	06	00	00	53
2000	00	00	00	00	08	08	17	15	07	00	00	00	55
2001	00	00	00	00	00	14	12	14	08	05	00	00	53
2002	00	00	00	00	00	20	08	11	09	04	00	00	52
2003	00	00	00	00	00	12	14	00	08	07	00	00	41
2004	00	00	00	00	00	10	21	21	15	21	00	00	88
2005	00	00	00	00	00	12	25	12	8	00	00	00	57
2006	00	00	00	00	00	10	21	19	11	00	00	00	61
2007	00	00	00	00	00	12	14	16	00	00	00	00	42
Total	00	01	01	00	13	228	384	337	211	71	00	00	1246
Average	0	0	0	0	1	11	19	17	11	4	0	0	62

Source: Metrological Department

3.3.3 Humidity

BSNA generally experiences warm and humid climate. The average relative humidity at 8:30 am is 73.5% whereas in the evening at 17:30 it is 64.67% (Table3.5). The range of variation is from 47 to 88 per cent. The highest humidity over 88% occurs, in the month of

August during rainy season. The average relative humidity varies from 64.67 percent in the evening to 73.50 percent in the morning.

Table 3.5: Mean Monthly Relative Humidity (in Percent)

Timings	Months of the Year											
Hours	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
08.30	67	67	71	71	75	80	85	88	84	75	60	59
17.30	47	52	54	64	69	76	80	83	77	65	56	53

Source: Meteorological Department

3.3.4 Wind

Table 3.6 shows the number of wind direction days and mean wind speed in km/hr. The predominant wind direction is from northwest and west and the mean wind velocity is 11.17 km/hr. Further wind movement from south direction is minimum with an annual average of 1.58 percent days.

Table 3.6: Wind direction

Month Wise Percentage of Days With Wind Coming From Different Directions													
Direction /Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual Average**
N	03	06	05	07	03	02	00	00	03	02	01	00	2.67
NE	08	13	05	12	05	00	00	00	01	09	16	16	7.08
E	03	05	02	04	00	00	00	00	00	13	21	24	6.16
SE	00	01	00	06	06	06	04	02	01	02	01	02	2.58
S	00	01	01	02	08	00	05	00	00	02	00	00	1.58
SW	00	00	01	01	22	33	43	38	13	00	00	00	12.58
W	00	00	00	02	08	24	31	34	13	00	00	00	9.33
NW	05	05	12	09	15	21	04	13	04	01	00	02	7.58
CALM	81	69	74	57	33	14	13	13	63	71	61	56	0.42
Mean Monthly Wind Speed (Km/Hour)													
	12	14	13	13	14	12	13	12	08	07	09	07	11.17

Source: Meteorological Department

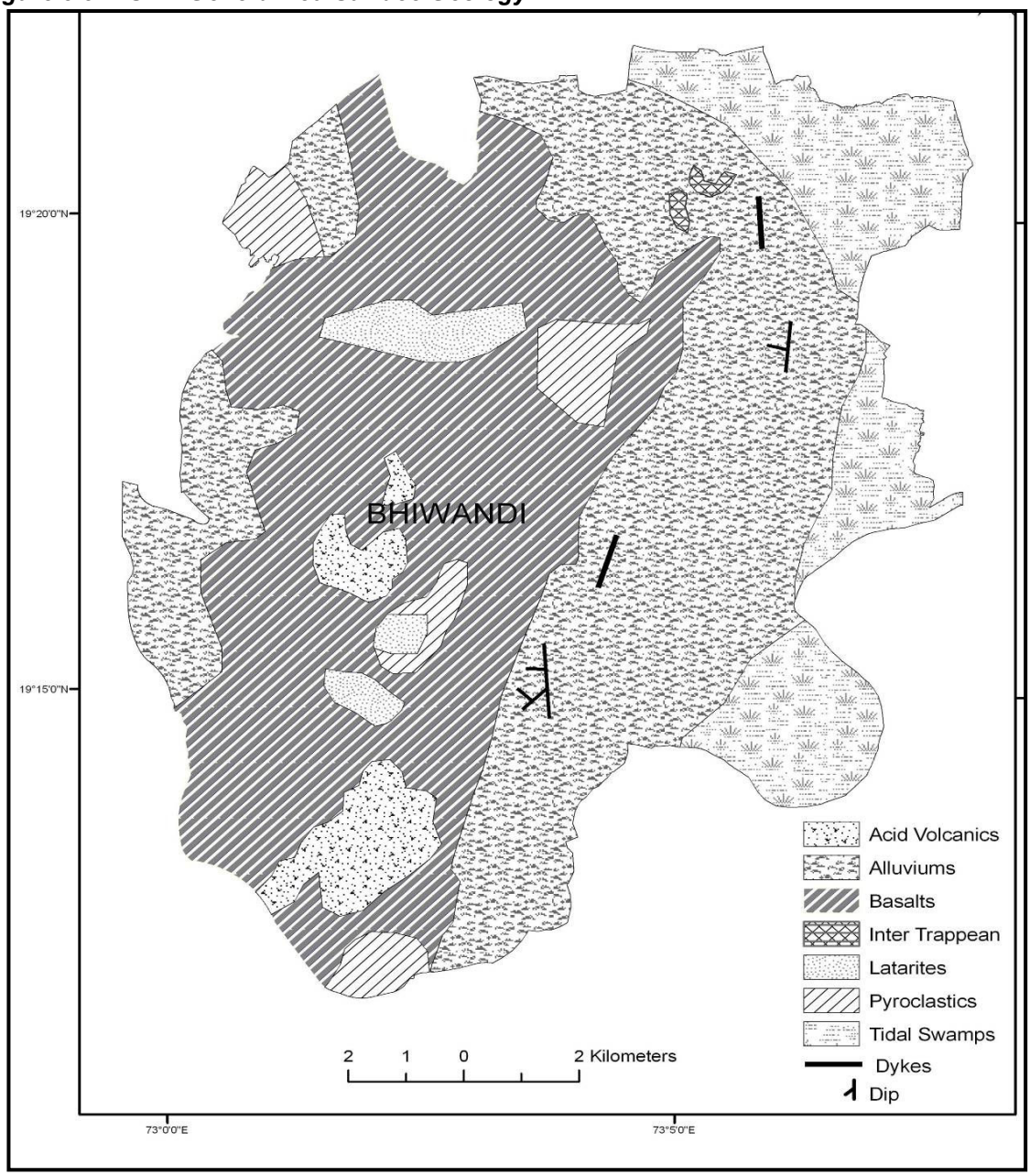
3.4 Geology

Geologically, the entire Ulhas Basin comprises of Deccan Trap with inter-trappean beds. The main rock types are basalts. Other rocks include trachytes, shells, volcanic breccias and tuff us occur in small quantities at some isolated locations.

3.4.1 Surface Geology

Entire area is occupied by basaltic lava flows commonly known as Deccan trap. The area is marked by a series of westerly dipping basaltic and spilitic lava flows separated by layers of intertrappean beds of shale and volcanic tuff. The eastern ridge of Bombay island shows greenish amygdaloidal basalts filled with green earth and well developed crystals of calcite. These flows have a westerly dip of120 to 150 degrees. The ridge comprised of stratified coarse-grained carbonaceous ash, massive andesitic lava flows with dykes of andesine and massive and vesicular zones. There is spectacular development of columnar joints in quarries at Varna / Bhalse areas where the columns of 20 to 40 m height are observed. Development of laterite is observed at 30 m above means sea level, where they are exposed on the hills situated on the east and west of Nasik road. The plains in the area are covered by marine alluvium comprising saline marine mud, shell limestone and calcareous sandstone (Figure 3.3).

Figure 3.3: BSNA-Generalized Surface Geology



The geology of the area differs from the rest of region. The main types of rocks are laterite, acidic volcanoes, ash beds, pyroclastics, Inter-trappean beds and mud flacks/alluvium (Figure 3.4). The Panvel Flexure postulated by Audan (1949) passing from Panvel through Kalyan near BSNA forms major structural feature in the region. Flexure marks a sudden increase in the dip of lava beds upto 10 degree and more on the western side, which is suggestive of a monoclinal flexure. On the Mumbra-Belapur ridge, a major fault has been mapped, extending to the west of Bhiwandi. Fox (1982) postulated the existence of an N-S strike-fault in Bombay Island separating the eastern and the western ridges. The magnitude of foundering along the western margin indicated by off-shore drilling by ONGC reveals the top of Deccan trap is in places more than 5000 feet below the mean sea level, while on the mainland has a height of more than 3000 feet above the mean sea level.

3.4.2 Sub-surface Geology

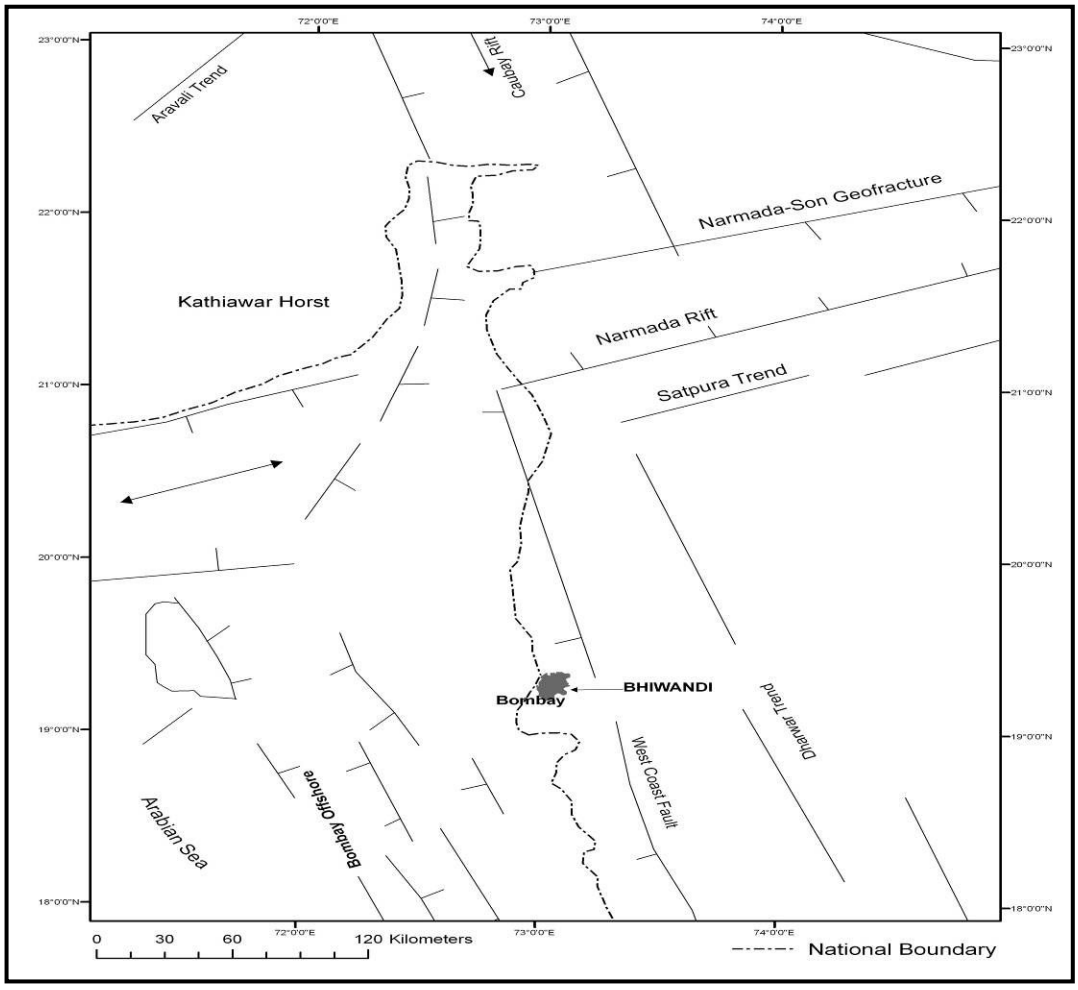


Figure 3.4: BSNA-Geo-Tectonic Divisions

Three boreholes drilled for exploring the possibility of ground water at Dhandhuka, Wadhawan junction and Botad have revealed that the rocks are magnesia-rich, silica-poor and picrite-basalt near BSNA at N-W margin of Deccan trap. Out crops in Bombay area are interbeded with tholictic type of flow. Deep boring at Bombay for locating water reveals, little water yield. The deepest boring at Dhandhuka after reaching 584m depth was abandoned. The

core obtained provided an opportunity for studying penetrated rocks. The last 70 m consisted of volcanic agglomerates, grits and sandstone, the latter were presumed to be infra-trepan (Figure 3.5) (*W.D.West, Department of Applied Geology, University of Saugar, Sagar*).

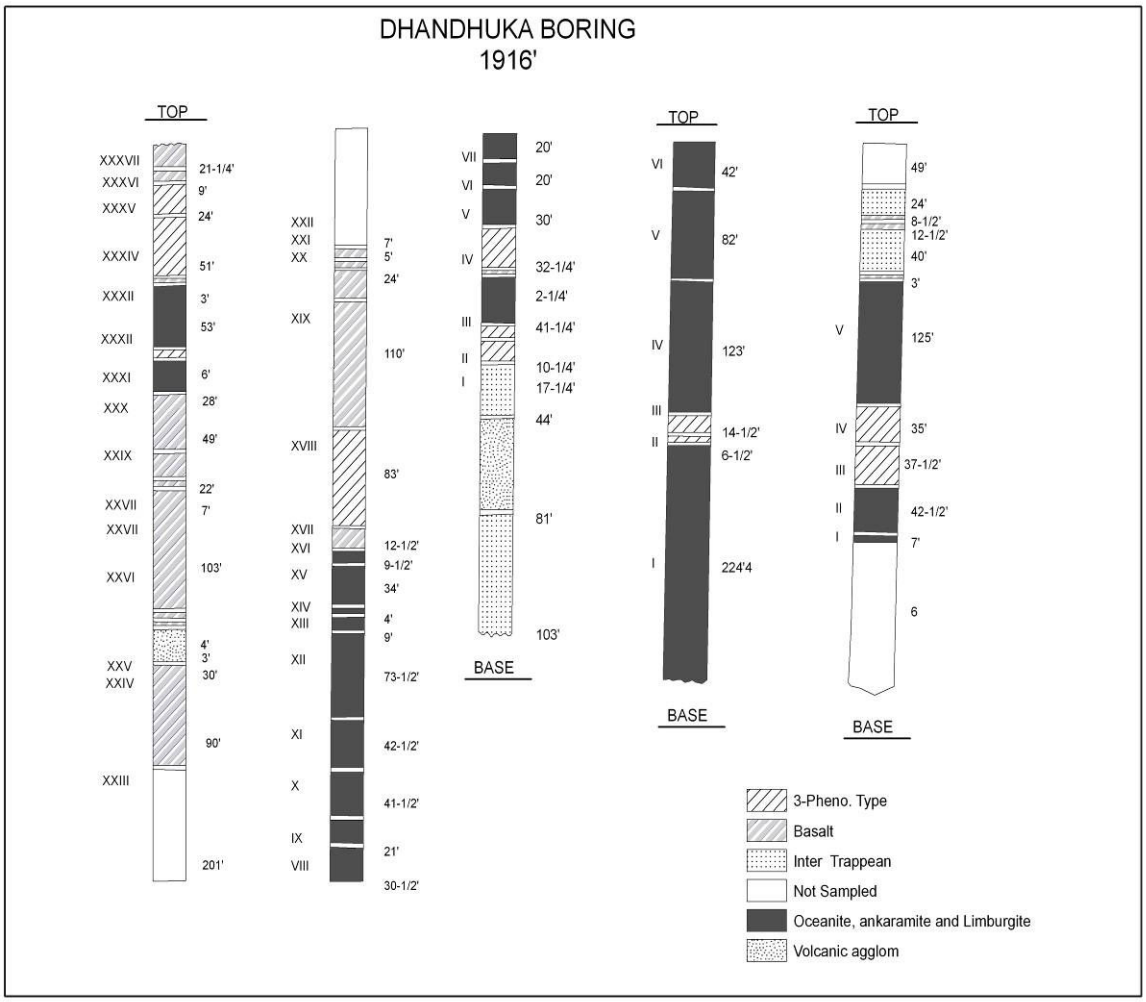


Figure 3.5: Dhandhuka Boring

The cores obtained for boring reveal the following three main categories Deccan trap flows in the area:

1. Basalts with phenocrysts of labradoride and occasional olivine.
2. Basalts with phenocrysts of bytownite, augtie and olivine.
3. Picrite-basalts including occanites ankaramites and limburgites.

3.4.3 Sub-surface (Shallow) Geology

Subsurface geology of the area was studied on the basis of drilling up to 25 m through existing well sections. The lithological sections reveal that the wells in the area are tapping single lava flow. Upper part of the flow is made up of weathered, jointed amygdoidla basalts.

This is followed downward by poorly jointed, grayish blue colored massive trap. Table 3.7 shows the geological description of the BSNA.

Table 3.7: BSNA- Geological Description

Unit	Name of Formation	Geological description	Elevation range (above MSL)	Thickness in meters
I	Deccan trap	Weathered, jointed amygdoidla	25m to1 m	24 m
II	Deccan trap		Below 1 m	--

3.5 Occurrence of Earthquakes

Lithology in Thane is chiefly made up of basalt volcanic breccias and tachytylic. No minerals of economic importance are found in the region. Until 1967, the Deccan area was believed to be a stable earthquake-free zone. No major activity was recorded in this area for centuries. However, this was proved wrong when a major earthquake of a magnitude of 5.9 on Richter scale was recorded on December 10, 1967 with its epicenter near Koyna. Since then, the earthquakes have been taking place intermittently in the region including the Ulhas basin.

3.6 Construction Material

Both compact basalt and amygdaloidal basalt can be used for variety of construction purposes such as masonry work, roadwork or as aggregate in concrete. The detailed investigation carried out by the Mines and Geology Department, Maharashtra has identified the existing and proposed quarries in BSNA (Table 3.8&3.9).

Table 3.8: BSNA- Existing Quarries in BSNA

Site survey no.	Location / village	Area (Ha)	Height of Extraction Permitted (m)
95/4	Kalwar	1.27	22.00
93/3	Kalwar	0.80	20.00
95/6	Kalwar	0.49	20.00
95/4 A	Kalwar	0.60	17.00
115	Dapode	2.70	20.00
86	Savandhe	2.00	-

Table 3.9: BSNA- Proposed Quarry Location

Sr. No.	Site survey No.	Location/village	Area (Ha)	Extraction Height Permitted
1	32	Mankoli	12	N.A

Source: - District Mining Officer Thane

3.7 Soils Types

The soil types in the area are loamy, sandy loam, loam and sandy clay (Table 3.10).

Table 3.10 : BSNA- Soil Types

Depth. (cm.)	Text Ural class	Hydraulic conductivity (m/day)
0-12	Loam Sand	0-6.4
12-35	Sandy Loam	0-3.7
35-80	Loam	0-2.2
80-150	Sandy Clay	0-1.6

Black soil containing sand is found all along the coast particularly in parts of southwest and southeast of the project area. It is suitable for paddy cultivation (salt tolerant). Red and brown soil is found in the eastern villages of Shivnagar, Elkunde, Sonale, Valshind and Bhinar. Further north and east on the hill slopes, the soil is poor and used for grass or coarse grain like nagli, vari etc. The attributes of soil profile in general are given in Table 3.11

Table 3.11: BSNA- Soil Profile

Depth range (cm)	Characteristics
0-60	Top soil (Loams sand, Loam)
60-120	Soft Murram
120-240	Hard Murram
240-450	Soft Rock
>450	Hard Rock

3.8 Ground Water Conditions

3.8.1 Introduction

The drinking water supply of BSNA is based on surface water reservoir of Tansa and Bhatsa dams located in hinterlands. These reservoirs are depleted during the post-monsoon period (October to June) and if the supply is not renewed through timely arrival of monsoon, the storage level becomes critical needing various measures of conservation before the on-set of monsoon. In case, the arrival of monsoon is delayed beyond the middle of June, the water problem of the area becomes alarming. In view of the magnitude of the problem, although short lived, the authorities face anxious moments before the arrival of the monsoon almost every year. The delayed arrival being not infrequent, the solution to these problems would demand not only conservation measures but also possible augmentation through various sources such as:

1. Creation of additional surface water reservoirs/ water harvesting structures;
2. Supplemental use of groundwater by constructing open dug wells/bore-wells/infiltration galleries.

3.8.2 Hydro-geological Survey

3.8.2.1 Shallow Aquifers

Rainfall, topography and geological set up are the important factors controlling the occurrence and movement of groundwater. The hydro-geologic potential of a rock formation is governed by combination of geologic characteristics of rock unit and hydrological conditions of the area. The basaltic flows have been included under the hard rock category because of absence of significant amount of inter-granular porosity. The secondary porosity created due to weathering, jointing and fracturing makes the hard rock not only to hold water but also transmit a substantial quantity of water.

The area is underlain by westerly dipping sequences of basaltic and spilitic lava flows separated by intervening layers of intertrappean shale's and volcanic tuffs. Each of these types is massive and consolidates having very poor primary porosity. The limited porosity occurs due to vesicular and brecciates units of individual lava flows, joints, fractures, fissures, and lava cavities / tunnels and interflow partition plains. Most of the formations in area display major joints in north-south direction having easterly dips.

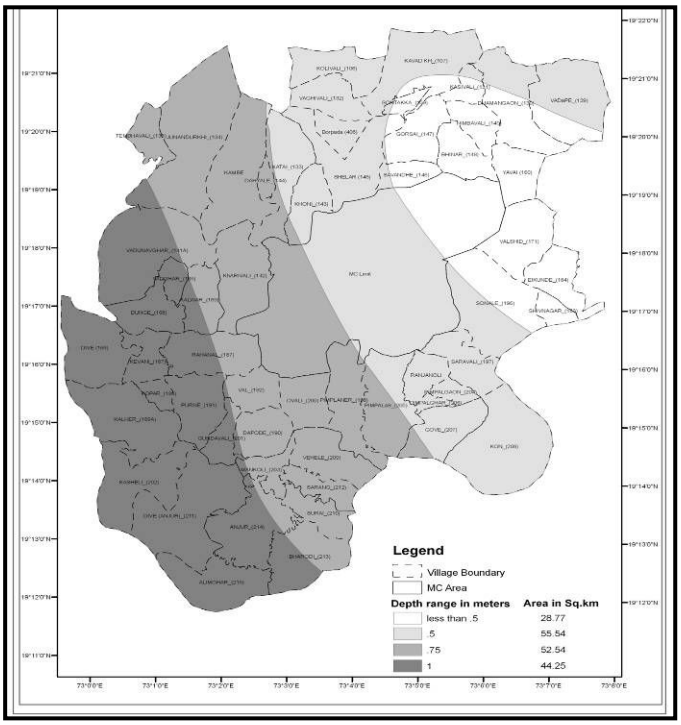
The rocks dipping westward and their strikes partition planes between lava flows and eastward movement govern the westward movement of groundwater by the major easterly dipping strike joint systems. The alluvial fill of low-laying areas underlain by weathered basalts has relatively better hydro-geologic potential in the project area.

3.8.3 Depth to Water

The inventory of various groundwater structures indicates depth to water level at different locations in BSNA. The depth to water varies from 4.2m to 7.35m during the pre-monsoon period. It is evident from the figure (Figure 3.6) that in Kon, Gove, Pimpalgaon, Pimpalghar, Shivnagar, Part Ranjnoli and part Pimpalas villages, depth to water varies from 6-7m from surface. A large part of BSNA has water table within 5-6m (Table 3.12). Depth to water during post-monsoon period has also been compared and it is observed that the water level varies from 0.5 m at Ovali to 1.05 m at Dapode.

Table 3.12: BSNA-Area under Different Depths to Water (May 2007)

Depth to Water (m)	Area (hectare)
0 – 4	-
4 – 5	3182
5 – 6	13269
> 6	1649



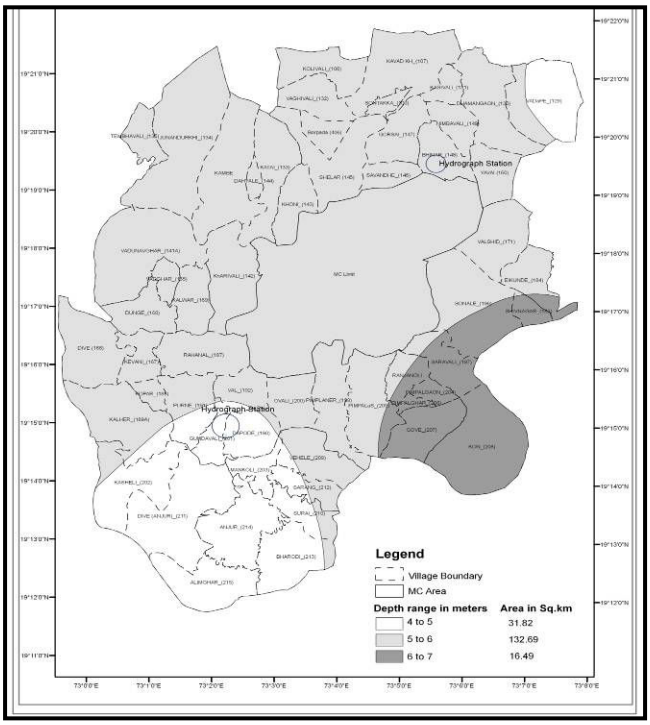


Figure 3.6: Depth of Water (May 2007) ***Figure 3.7: BSNA- Depth of Water (October 2007)***

Figure 3.7 shows that during post- monsoon season depth to water increases from east to west. The table 3.13 shows the area at different water table depths in BSNA.

Table 3.13: BSNA- Area under Different Water Table Depth (October 2007)

Depth to Water (m)	Area (hectare)
0 –0.5	2877
0.5 – 0.75	5554
0.75 – 1	5254
> 1	4425

3.8.4 Water Table Fluctuation

Water table maps have been prepared for the period 1991- 2007 both for pre (Figure3.8) and post- monsoon (Figure 3.9) periods.

Figure 3.8: BSNA-Water Table Fluctuation (May 1991 to May 2007)

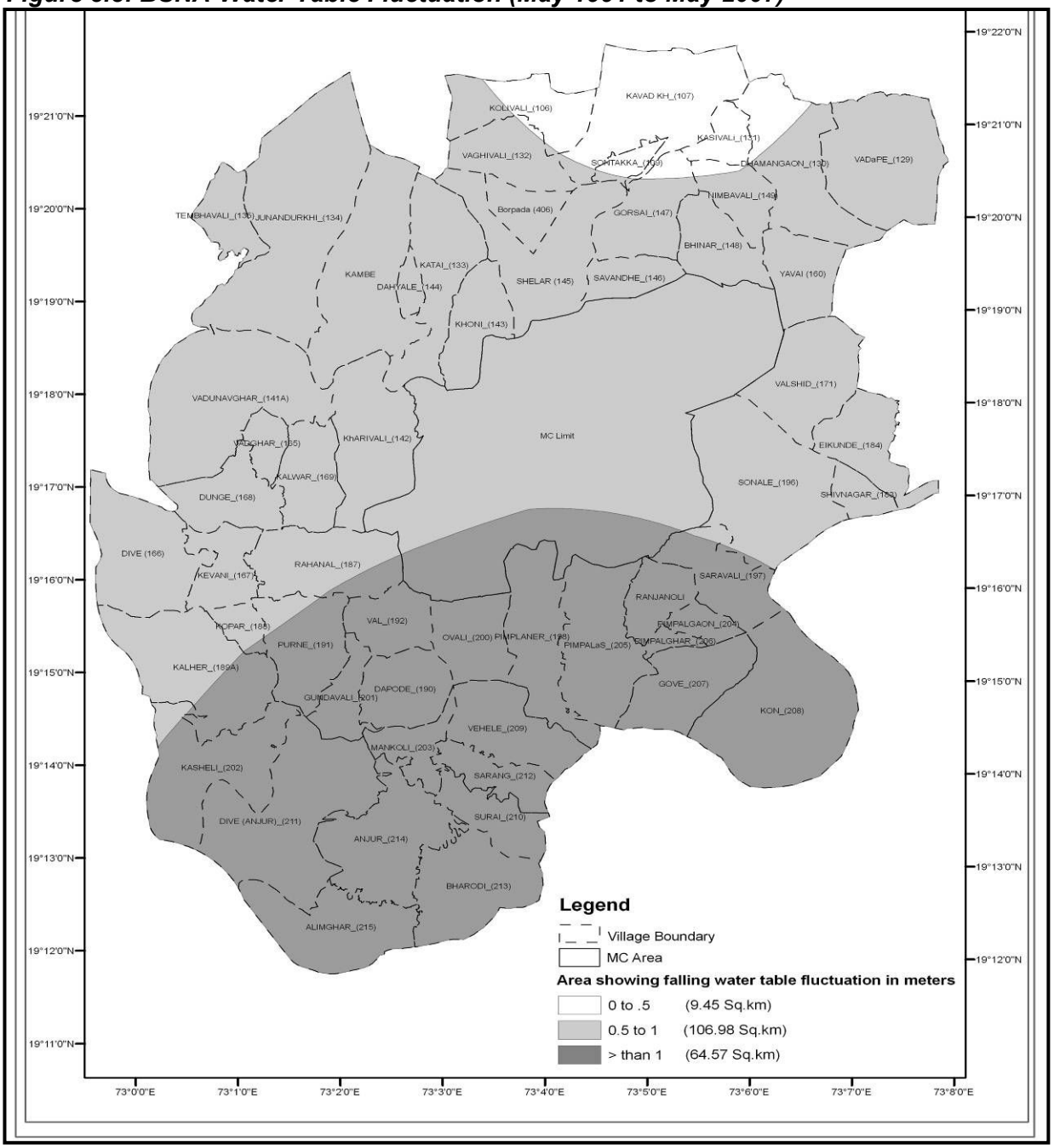


Figure 3.8 show that southern part of BSNA has experienced water table fluctuation of more than 1m between 1991 and 2007 in pre-monsoon period. A small patch in the north of BSNA experienced minimum fluctuation 0 to 0.5m and the eastern, central and western part of BSNA witnessed a water fluctuation in the range of 0.5 to 1.0m during the same period.

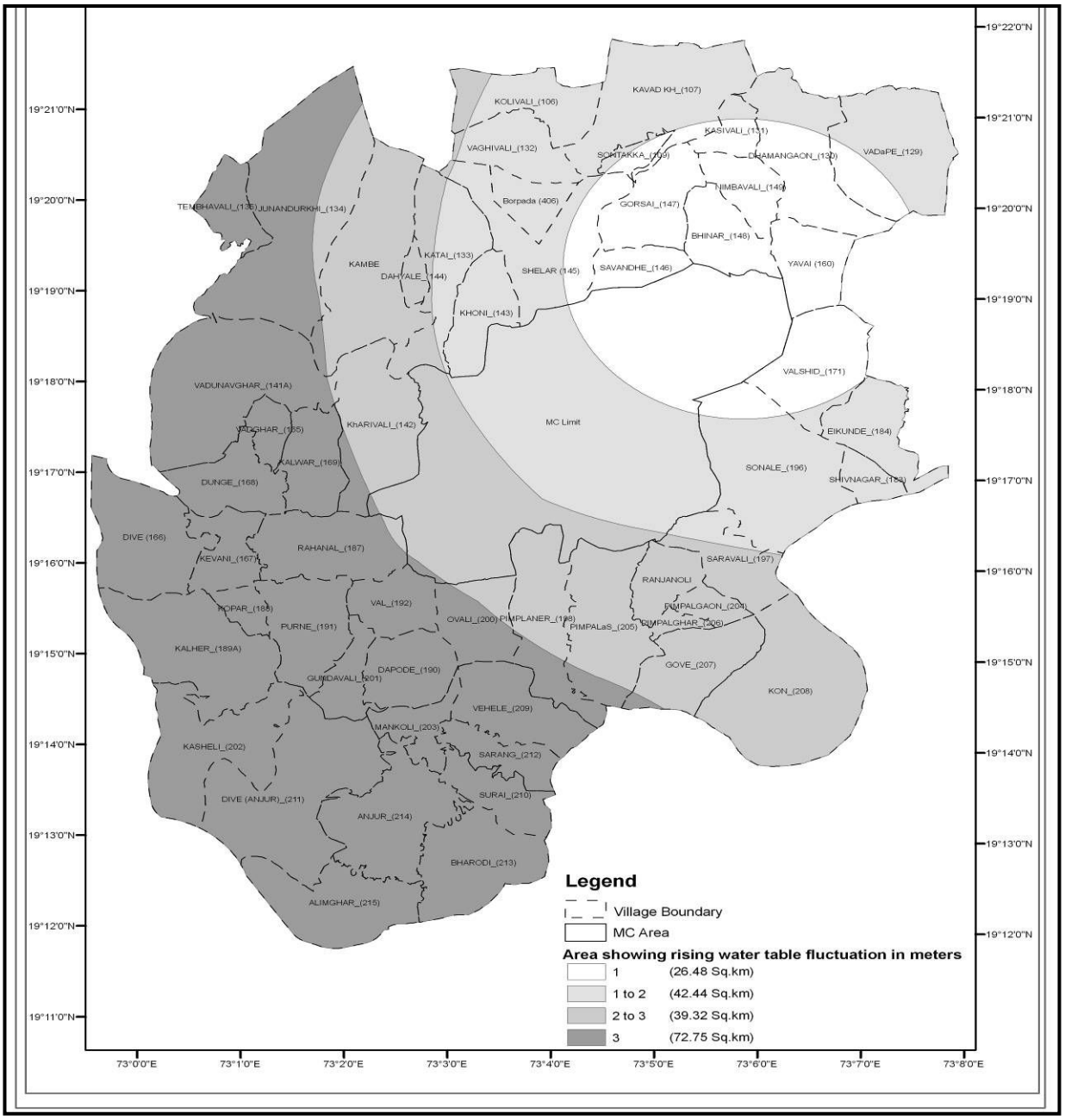


Figure 3.9: Water Table Fluctuation (October 1991 to October 2007)

Figure 3.9 reveals that south, southwest and northwest part of BSNA experienced water table fluctuation upto 3m during October 1991 to 2007. The north-eastern BSNA experienced minimum fluctuation of 1m during the same period. Some parts in the north centre and northeast BSNA experienced 1- 2m fluctuation. The northwest and southeast parts of BSNA experienced 2-3m fluctuation during October 1991 to 2007 and western part of BSNA witnessed a water fluctuation in the range of 0.5 to 1.0m during 1991 to 2007.

Table 3.14 shows depth to water table fluctuation under various zones during pre-monsoon period (May 1991 to May 2007).

Table 3.14: BSNA- Depth to Water Table Fluctuation (May 1991 to May 2007)

Depth to water (m)	Area (hectare)
0-0.5	945
0.5-1	10698
>1	6457

Table 3.15 shows depth to water table fluctuations under various zones during post-monsoon period (October 1991 to October 2007).

Table 3.15: BSNA- Depth to Water Table Fluctuation (October 1991 to October 2007)

Depth to water (m)	Area (hectare)
0 –1	2648
1 – 2	4244
2 – 3	3932
> 3	7275

3.9 Hydraulic Properties

For determination of hydraulic properties, the Ground Water Survey and Development Authority has conducted the aquifer performance tests. Six exploratory boreholes have been drilled to determine the aquifer characteristics (Table 3.16). Based on the analysis of pumping test data, the hydraulic properties have been studied.

Table 3.16: BSNA- Detail of Aquifer Performance Test (ATP) Conducted by Ground Water Department, Thane

Taluka	Village	Water Shed No.	Month	Year	Type of Aquifer	Specific Capacity lph/m	Transmissibility	Storage Coefficient
Bhiwandi	Ambadi	WF-27	Feb.	1990-91	Jointed Basalt	87.50	11.12	0.017
Bhiwandi	Angaon	WF-29	Feb.	1985-86	Massive Basalt	134.25	30.33	0.018
Bhiwandi	Dabhad	WF-27	Feb.	1990-91	Massive Basalt	27.30	38.15	0.032
Bhiwandi	Dighashi	WF-27	March	1990-91	Amyagdular Basalt	150.00	57.53	0.032
Bhiwandi	Dugad	WF-27	Feb.	1990-91	Massive Basalt	31.03	39.27	0.021
Bhiwandi	Pimpalas	WF-31	Jan.	1990-91	Amyagdular Basalt	199.00	46.18	0.027

All exploratory tube-wells drilled in the water shed no. 27, 29 and 31 have shown specific capacity values ranging from 27 to 199 lph / m. The type of the aquifer is jointed basalt, massive and amygdular basalt.

Based on the discharge of the minor irrigation unit the zone-wise area has been plotted, evaluated and shown in Figure 3.10.

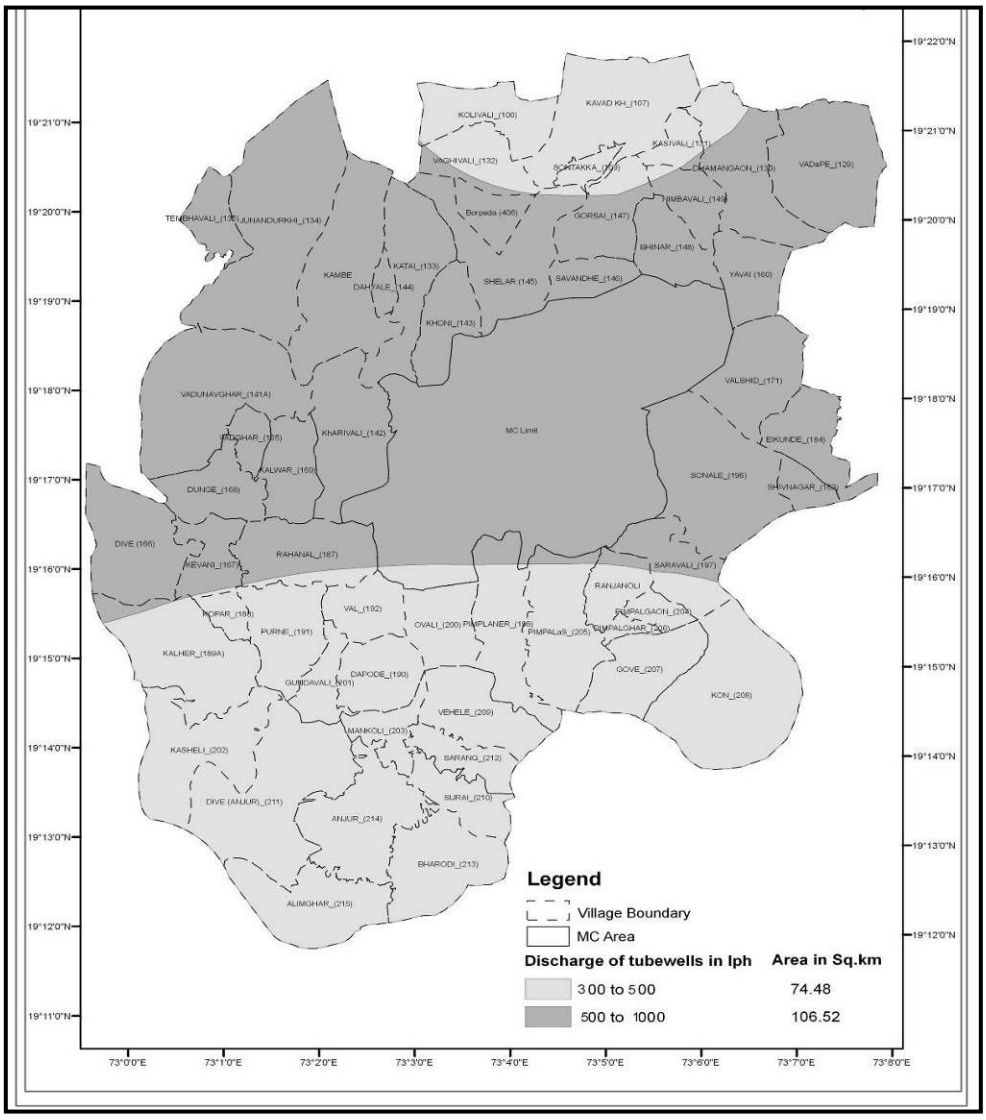


Figure 3.10: BSNA- Discharge of Tube Wells (lph)

Table 3.17: BSNA- Discharge of Tube Wells (lph)

Sr. no.	Discharge (lph)	Area (ha)
1	300 - 500	7448
2	500 - 1000	10652

3.10 Forest

The forest cover in BSNA extends over 1303.76 hectares. On the northern side of BSNA, three villages, Katai, Kambe and Junandurkhi have a large forest cover, i.e. 31.5%, 30.4%, 41.4% respectively of their total geographical area.

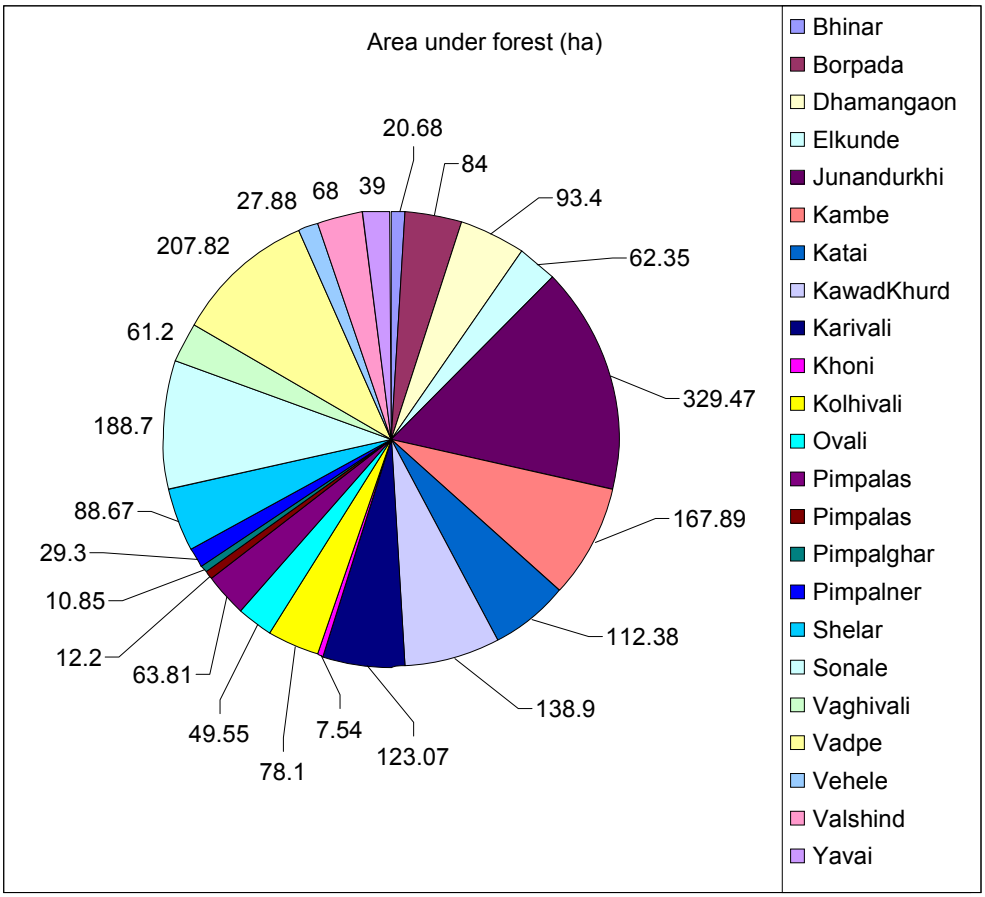


Figure 3.11: BSNA- Area under Forest Cover in Different Villages

Figure 3.11 show that 8 villages namely- Kambe, Junandurkhi, Vadpe, Katai, Sonale, Kawadkhurd and Karivali have more than 100 hectares of area under forest forming a rich environmental asset in BSNA.

3.11 Summary

The study reveals that BSNA is marked by undulating terrain dotted with hills, ridges, forests, inland water bodies, creeks and minor inlets. The topography of BSNA is uneven. The water supply pipelines in the area are one of the most important physical (man-made) features supplying water to the area in addition to Thane and Mumbai. However, these also restrict a multi-directional development of the area.

The relief analysis reveals that about half of BSNA (49%) is below 10m contour level forming a low-lying area. The area along the Ulhas and Kamvadi Rivers is prone to floods. The drainage conditions of the region are poor. The drainage system may be divided into four zones i.e. northwest, southeast, northeast and southwest of the area. The monthly temperature ranges between 16^0C to 34^0C. The BSNA having humid tropical climate receives 400-800mm annual rainfall. The relative humidity varies from 47% to 88% in the region

During monsoon season, the areas along the rivers and creeks become flooded and water level rises up to 4-5 feet above mean sea level. Due to poor drainage, most of the area of

Bhiwandi and its surroundings witness inundation due to high tides causing loss to the local economy.

The area is underlain by basaltic lava flows (Deccan trap) is almost free from earthquakes. However, the Koyna tremor has verified the probability of seismicity in the region. The region has loam, sand, sandy loam and sandy clay soils. The ground water table varies from 4 to7m in pre-monsoon period and from 0.5 to 1m deep in post monsoon period. The agro-climatic conditions offer a suitable environment for paddy and some horticultural crops.

CHAPTER - IV

DEMOGRAPHY AND SETTLEMENTS

4.1 Introduction

Demography involves study of size, distribution and composition of human population. The data collected for population studies is broadly categorized as time series and spatial data. In the former, change and transformation of various demographic aspects are measured. In the later distribution pattern is studied. The study of demographic characteristics is required for assessing infrastructural facilities and for evaluating the existing. This information forms the bases of formulating future development plans and policies. Bhiwandi Surrounding Notified Areas (BSNA) supports a total population of 1, 65,633 persons (2001, Census).

4.2 Population Size

4.2.1 BNMC population

Bhiwandi is one of the fast growing areas of the Mumbai Metropolitan Region. The city had a population of 47,630 persons in 1961. Since then there has been a rapid growth in the city population due to increasing labor inmigration. This factor has played a major role in transforming a small town into a large city of distinct characteristics. One of the major reasons of population growth was boom in the handloom and later the power loom industry. This attracted a large number of migrants mainly from Utter Pradesh, Bihar, Andhra Pradesh and other states of India.

The area under BNMC is 26.40 sq. km. and it consists of twelve villages namely, Bhiwandi, Nizampur, Bhadvad, Chavindra, Fene, Gauripada, Kamatghar, Kaneri, Nagaon, Narpoli, Pogaon, Temghar. These villages are further divided into 65 census wards with total population of 5, 98,741 persons with average density of 22679.5 persons/ sq km. The population has grown at an average rate of about 92% per decade, with maximum increase of 165% during 1981 - 1991 giving one of the highest growth rates in the MMRDA region **(Figure 4.1, 4.2&4.3).**

Table 4.1 Population Growth of Bhiwandi - Nizampur (1961-2001)

Year	Area (Sq km)	Population	Decadal Growth
1961	4.72	47630	-
1971	-	79576	67.87
1981	-	210712	164.79
1991	26.4	378546	79.65
2001	-	598741	58.16

Source: Environmental Status Report for Bhiwandi-Nizampur city and Census Data 2001

4.2.2 BSNA Population

BSNA consists of 60 villages having total population of 1, 65,633 persons (2001). Four villages Khoni, Kon, Katai, and Shelar are categorized as Census Towns grown under the influence of Bhiwandi and Kalyan city. Three of these namely Katai, Khoni and Shelar share the boundaries with BNMC and Kon is adjoins Kalyan city.

Table 4.2 BSNA Village wise Area and population

Sr. No	Name of Village	Area in (Sq km)	Total Population	Sr. No	Name of Village	Area in (Sq km)	Total Population
1	Alimghar	4.04	3353	30	Mankoli	1.42	2310
2	Anjur	4.03	2937	31	Nimbavali	1.42	950
3	Bharodi	0.29	1243	32	Ovali	2.02	1215
4	Bhinar	2.00	1519	33	Pimpalghar	0.35	1068
5	Borpada	1.81	1341	34	Pimpalas	4.48	3386
6	Dahyale	0.42	257	35	Pimpalgaon	0.64	2023
7	Dapode	2.09	1677	36	Pimpalner	3.26	1748
8	Dhamangaon	4.06	2025	37	Purne	2.73	2772
9	Dive	3.4	1731	38	Rahanal	3.62	6906
10	Dive Anjur	5.18	2835	39	Ranjnoli	1.34	2760
11	Dunge	2.00	1729	40	Sarang	1.21	693
12	Elkunde	2.03	551	41	Saravali	1.38	1877
13	Gundavali	1.02	1784	42	Savandhe	1.12	1885
14	Gorsai	2.33	1779	43	Shelar (CT)	5.27	10612
15	Gove	2.18	2795	44	Shivnagar	4.14	2433
16	Junandurkhi	7.95	3208	45	Sonale*	2.93	999
17	Kalher	5.22	7485	46	Sontakka	2.95	908
18	Kalwar	2.01	2941	47	Surai	1.58	1343
19	Kambe	5.52	5086	48	Tembhvali	1.45	1315
20	Kasheli	3.6	2345	49	Vadpe	4.69	1268
21	Kashivali	1.16	573	50	Vadghar	0.74	1267
22	Katai (CT)	3.56	11252	51	Vadunavghar	5.49	2584
23	Kawad Khurd*	5.3	2643	52	Vaghivali	2.08	1545
24	Kevani	1.89	2186	53	Val*	0.66	1095
25	Karivali	3.34	615	54	Vehele	6.44	2340
26	Khoni (CT)	1.8	22686	55	Valshind	3.03	807
27	Kolhivali	2.49	2294	56	Yavai	2.07	491
28	Kon (CT)	5.55	15159		**Total**	**151.09**	**165633**
29	Kopar	0.68	1004				

Source: Primary Census Abstract – Thane, 2001

Thakurgaon, Rajnagar, Kailashnagar and Rohini are the newly carved villages

Figure 4.1: Population Size of villages in BSNA (1981)

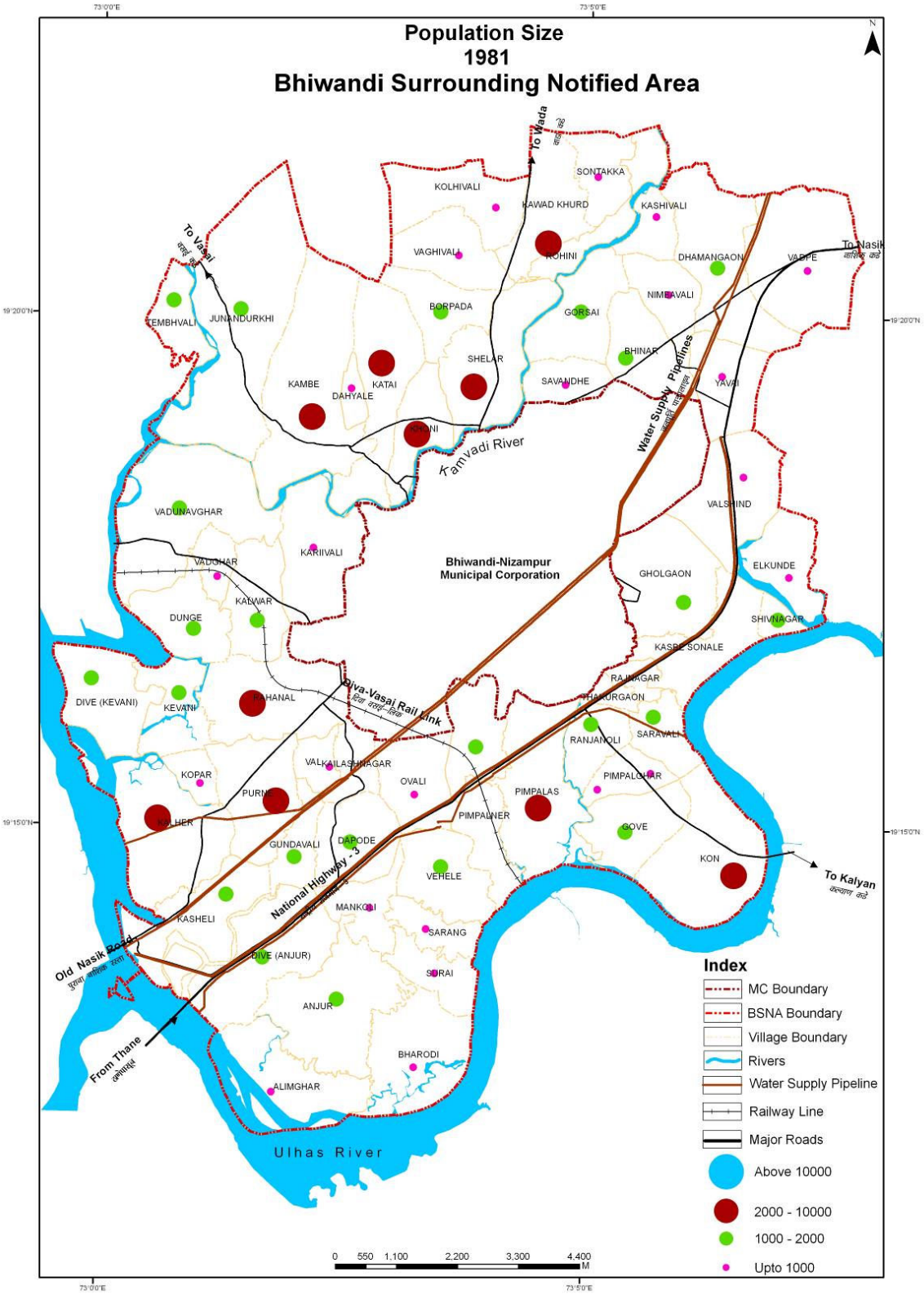


Figure 4.2: Population Size of villages in BSNA (1991)

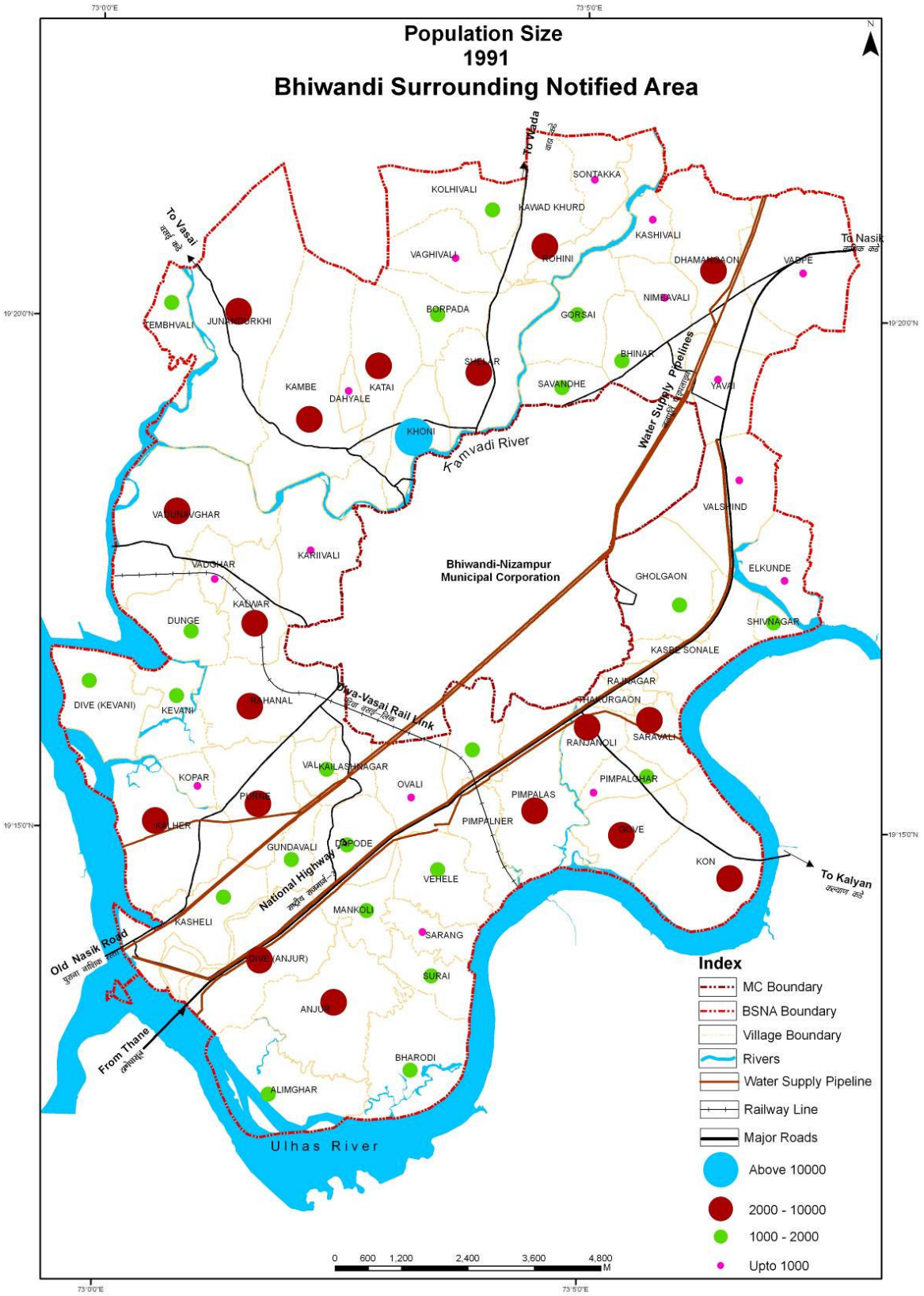


Figure 4.3: Population Size of villages in BSNA (2001)

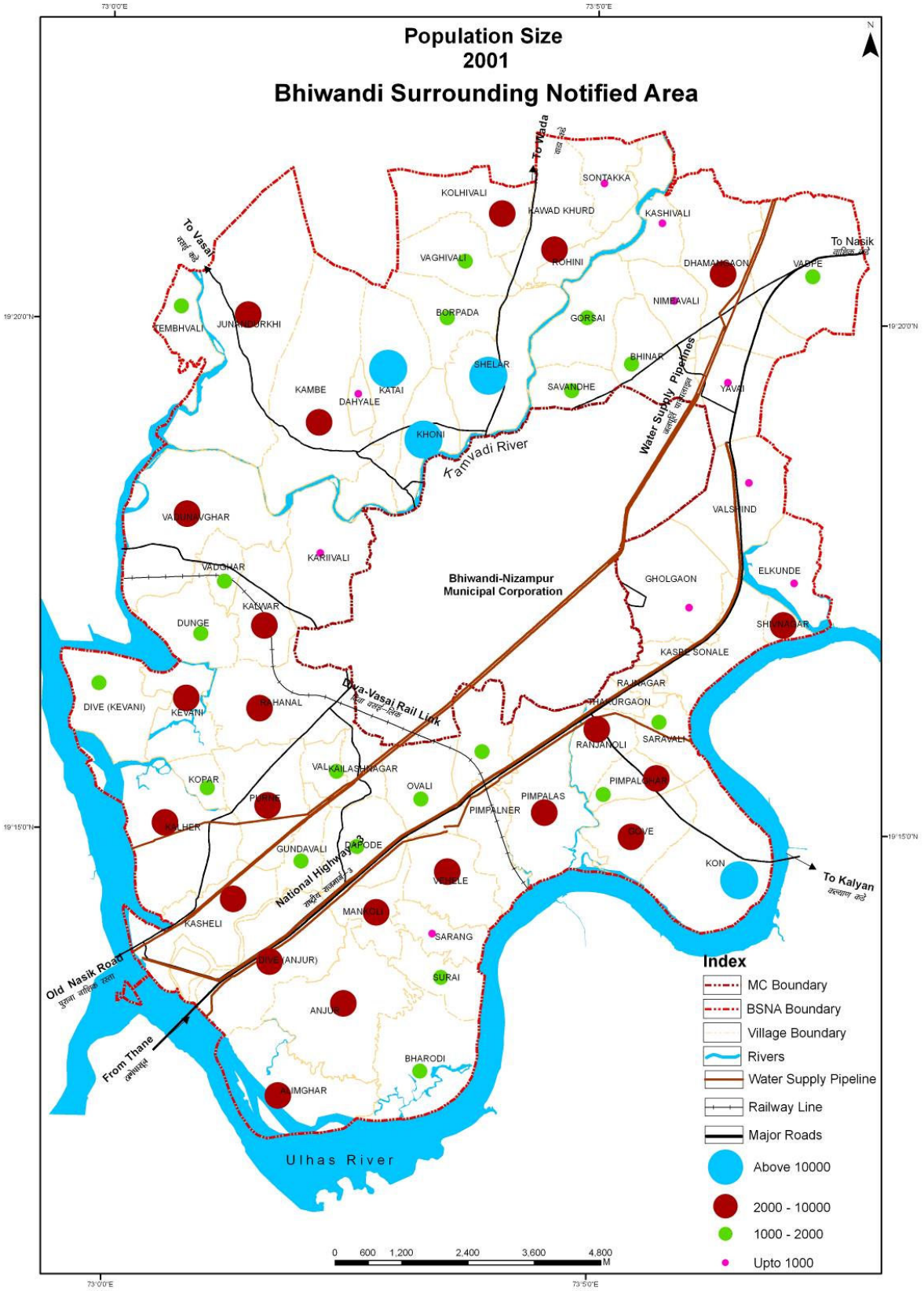


Table 4.2 reveals the area and population village-wise whereas Figure4.1 indicates the size-wise distribution of villages and population.

Table 4.3 BSNA Population Density

Year	Total Population	Area (in sq km)	Density (in sq km)
1981	79242	152.35	520.14
1991	114349	148.49	770.10
2001	165633	151.09	1114.64

Source: Primary Census Abstract-Thane-1981, 1991 & 2001

Table 4.3 indicates the increasing trend of population density in BSNA. The average population density in BSNA was 520 person/Sq km in 1981. It increased to 1114 persons/Sq km in 2001. It indicates that population density has witnessed about two fold increase between 1981 and 2001 in BSNA. The villages having high density of population are Bharodi, Khoni and Pimpalghar. In 1991 and 2001 census, Bharodi, Pimpalghar, Katai and Bharodi, Khoni, Pimpalgaon villages registered a high density of population.

4.3 Growth

Study of population growth trends helps in projecting the population-based activities which are to be promoted or introduced. BSNA population increased at a decadal growth rate of 44% during 1981-1991 and 47.2% during 1991-2001. Population growing in BSNA may be attributed to the natural growth, influence of migration, increasing employ ability in the warehousing sector and power loom industries in BSNA and Bhiwandi city.

4.3.1 Growth in BSNA

Table 4.4 indicates increasing trend in population growth during 1981-2001.

Table 4.4 Decadal Growth rate of BSNA

Year	Total Population	Decadal Growth rate
1981	79242	-
1991	114349	44.3%
2001	165633	47.2%

Source: Primary Census Abstract-Thane-1981, 1991 & 2001

Another factor which has lead to the rapid increase in population is the of NH 3 passing through BSNA, which supported the required transportation network for godowns and warehouses development. The commodities coming from north and east of the country are stored in the BSNA. As per the 2001 Census the growth rate of Khoni, Kon, Katai and Shelar accelerated due to rapid growth of Bhiwandi and Kalyan city. Interestingly the growth rate of only Khoni declined from 114 to 72.59 percent as indicated in Table 4.5.

Table 4.5 Growth Rate of Urban Areas within BSNA

Sr. No.	Name of villages	1981	1991	2001	Decadal Growth rate	
					1981-91	1991-2001
1	Khoni	6139	13144	22686	114.1	72.59
2	Kon	5764	9197	15159	59.55	64.82
3	Katai	3398	5324	11252	56.68	111.34
4	Shelar	3299	4516	10612	36.88	134.98

Source: Primary Census Abstract-Thane-1981, 1991 & 2001

4.4 Composition of Population

Sex ratio in BSNA was 831 as compared to 650 of Bhiwandi in 1991. The sex ratio in both the cases declined to 751 in BSNA and 623 in Bhiwandi during 1991-2001 as indicated in Table 4.6. The ratio is lower than the Maharashtra urban average of 975 females per 1000 males. The decline in sex ratio may be attributed to male selective in-migration to BSNA and Bhiwandi city.

Table 4.6 Sex ratio in BSNA and Bhiwandi

Bhiwandi				BSNA		
Decade	Males	Females	Sex Ratio	Males	Females	Sex Ratio
1991	229000	149000	650	62449	51900	831
2001	367000	230000	623	96202	72209	751

Source: Census data for Bhiwandi – Nizampur city

4.4.1 Literacy in BSNA and Bhiwandi

Proportion of literates in Bhiwandi increased from 41.63% in 1991 to 65.83% in 2001 whereas in BSNA it increased from 50% in 1991 to 65.47% in 2001 as indicated in table 4.7(Figure 4.4,4.5&4.6).

Table 4.7 Proportion of Literates in Bhiwandi

Decade	Bhiwandi			BSNA		
	Total Population in Lakhs	Literates in Lakhs	Percent to Total	Total Population in Lakhs	Literates in Lacs	Percent to Total
1991	4.78	1.99	41.63	1.14	0.57	50.0
2001	5.97	3.93	65.83	1.68	1.10	65.47

Source: Primary Census Abstract-Thane-1981, 1991 & 2001

It may be attributed to the expansion of schooling infrastructure and economic development in both rural and urban areas.

Figure 4.4: Proportions of Literates in BSNA (1981)

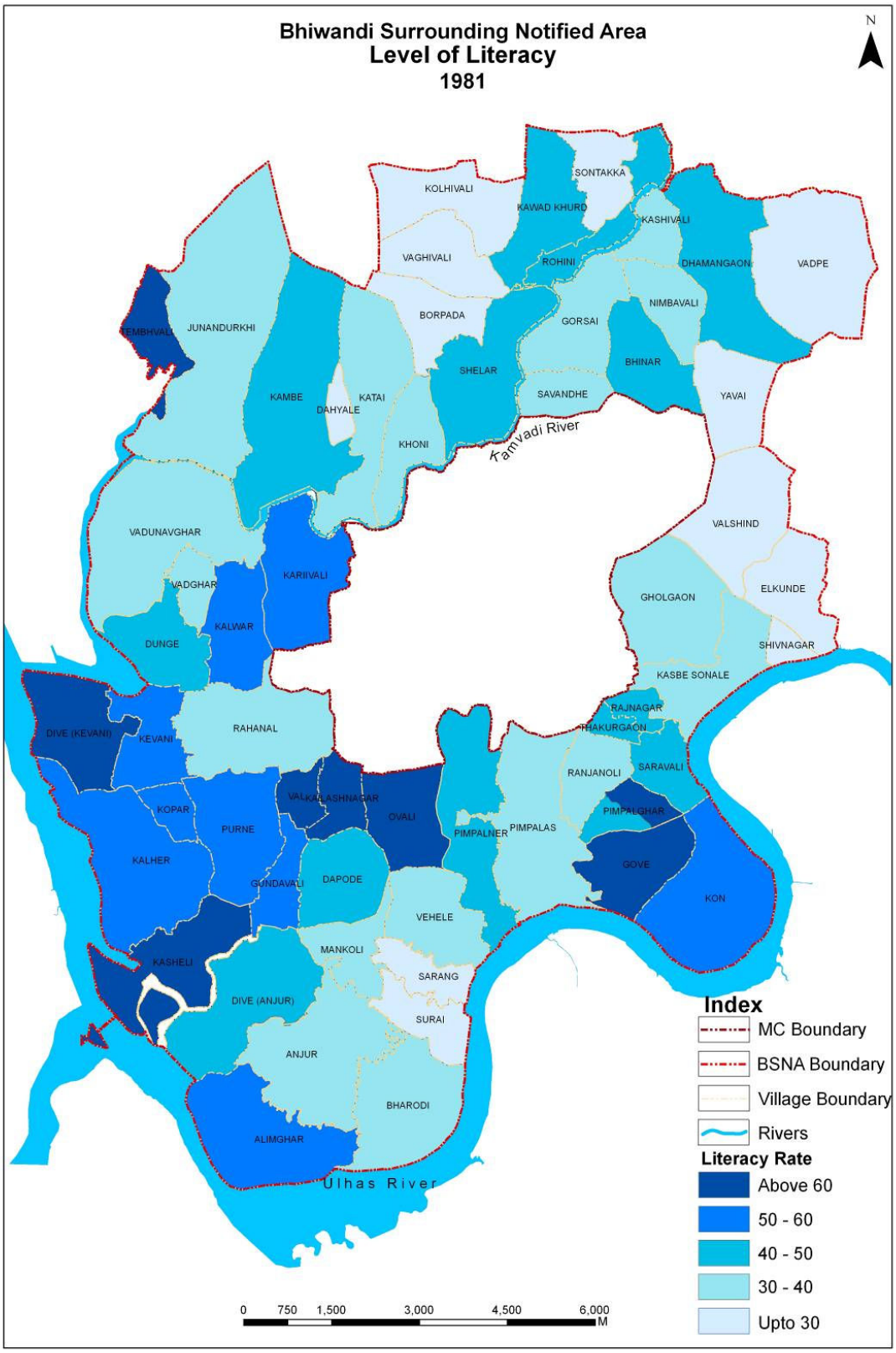


Figure 4.5: Proportions of Literates in BSNA (1991)

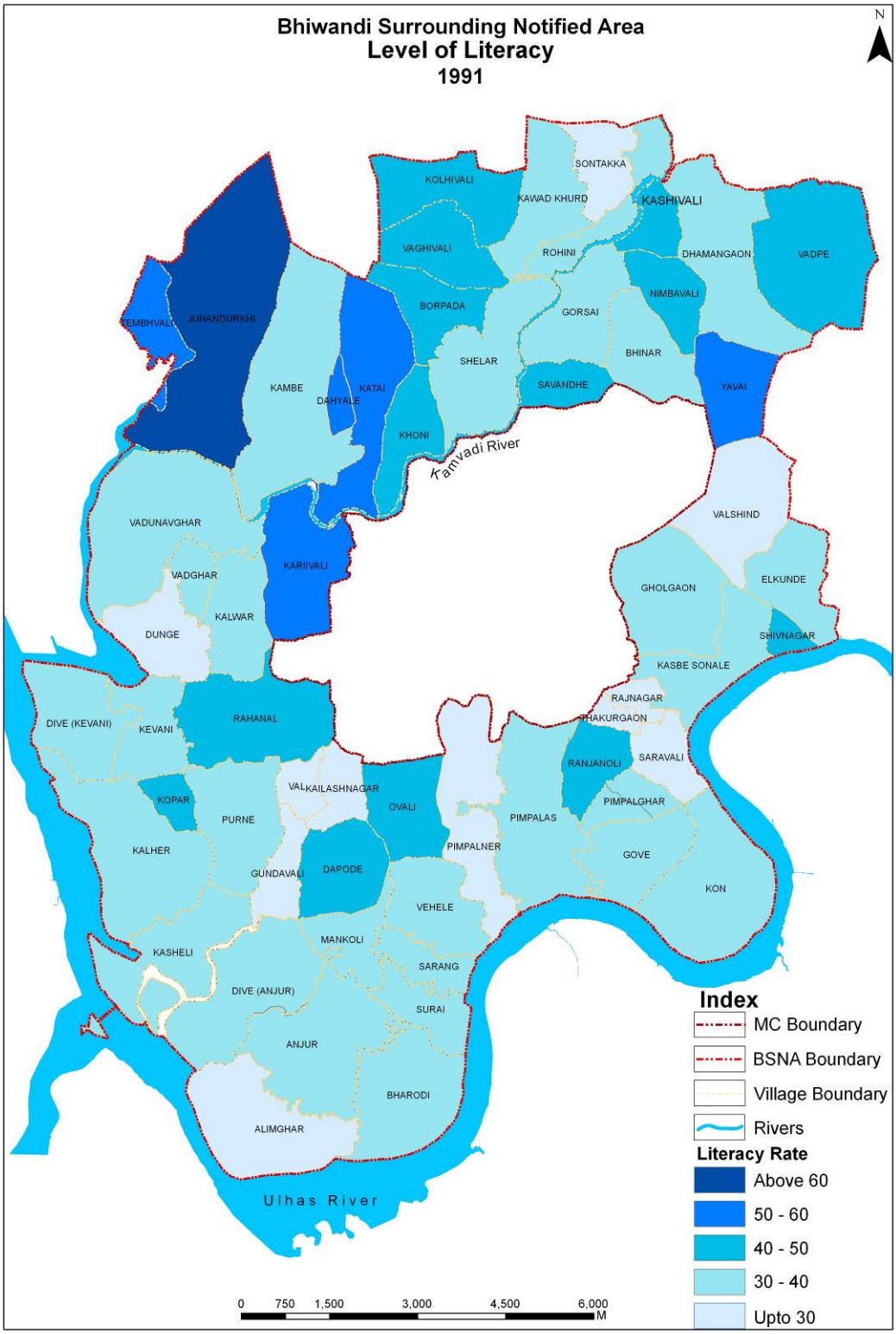
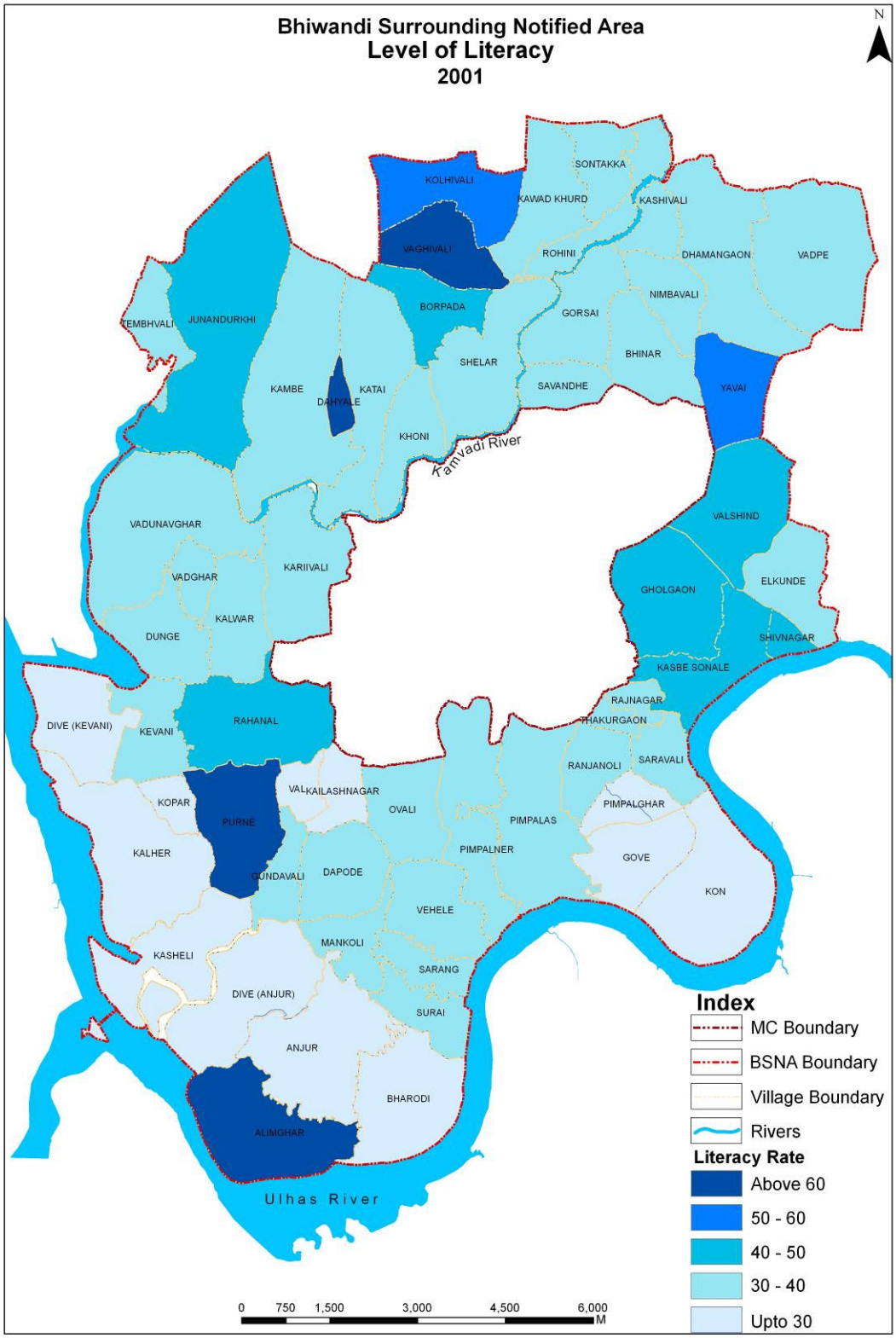


Figure 4.6: Proportions of Literates in BSNA (2001)



4.5. Occupational Structure

Table 4.8 BSNA Work Participation Rate

Year	Total Population	Total workers	Non-workers	Work Participation Rate
1981	79242	32777	46465	41.3%
1991	114349	52821	61528	46.2%
2001	165633	74476	91157	44.9%

Source: Primary Census Abstract-Thane, 1981, 1991, 2001

Table 4.8 indicates work participation rate in BSNA during 1981, 1991 and 2001. The proportion of workers has increased during 1981 to 2001. From 1981 to 1991 decade, increased from 41% to 46% but was 44.9% in 2001 (Figure 4.7, 4.8 & 4.9).

Figure 4.7 Work Participation Rate in BSNA (1981)

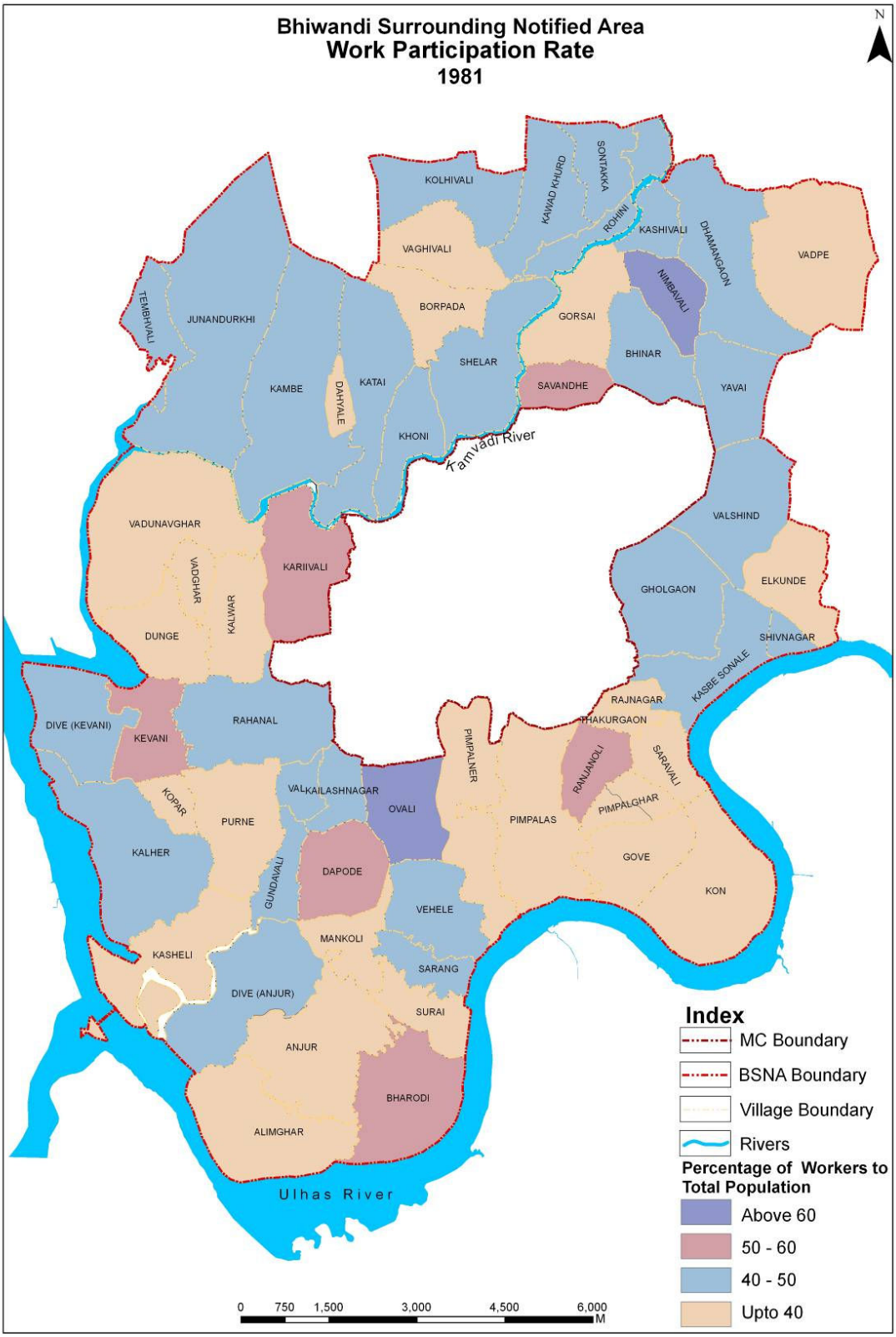


Figure 4.8 Work Participation Rate in BSNA (1991)

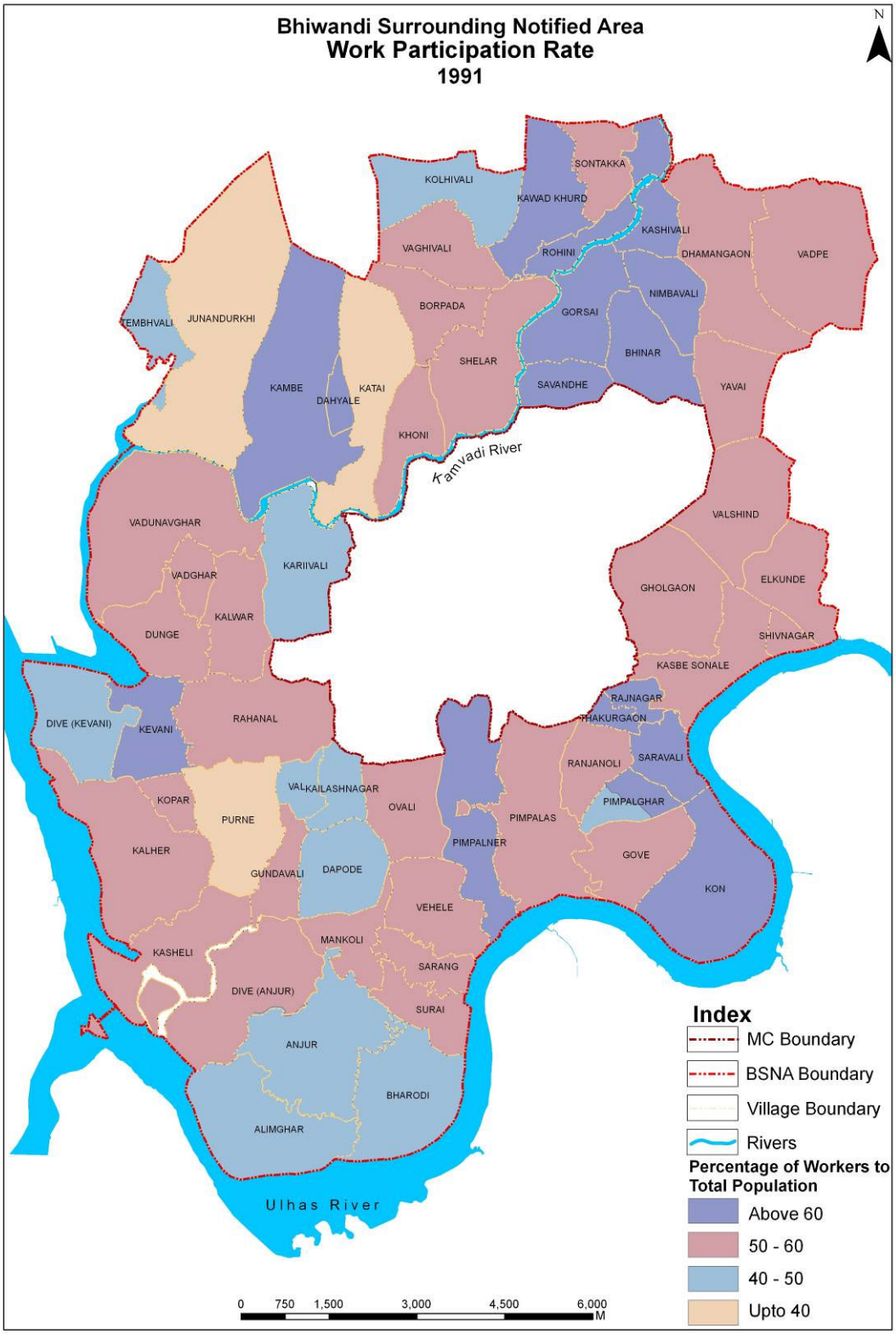
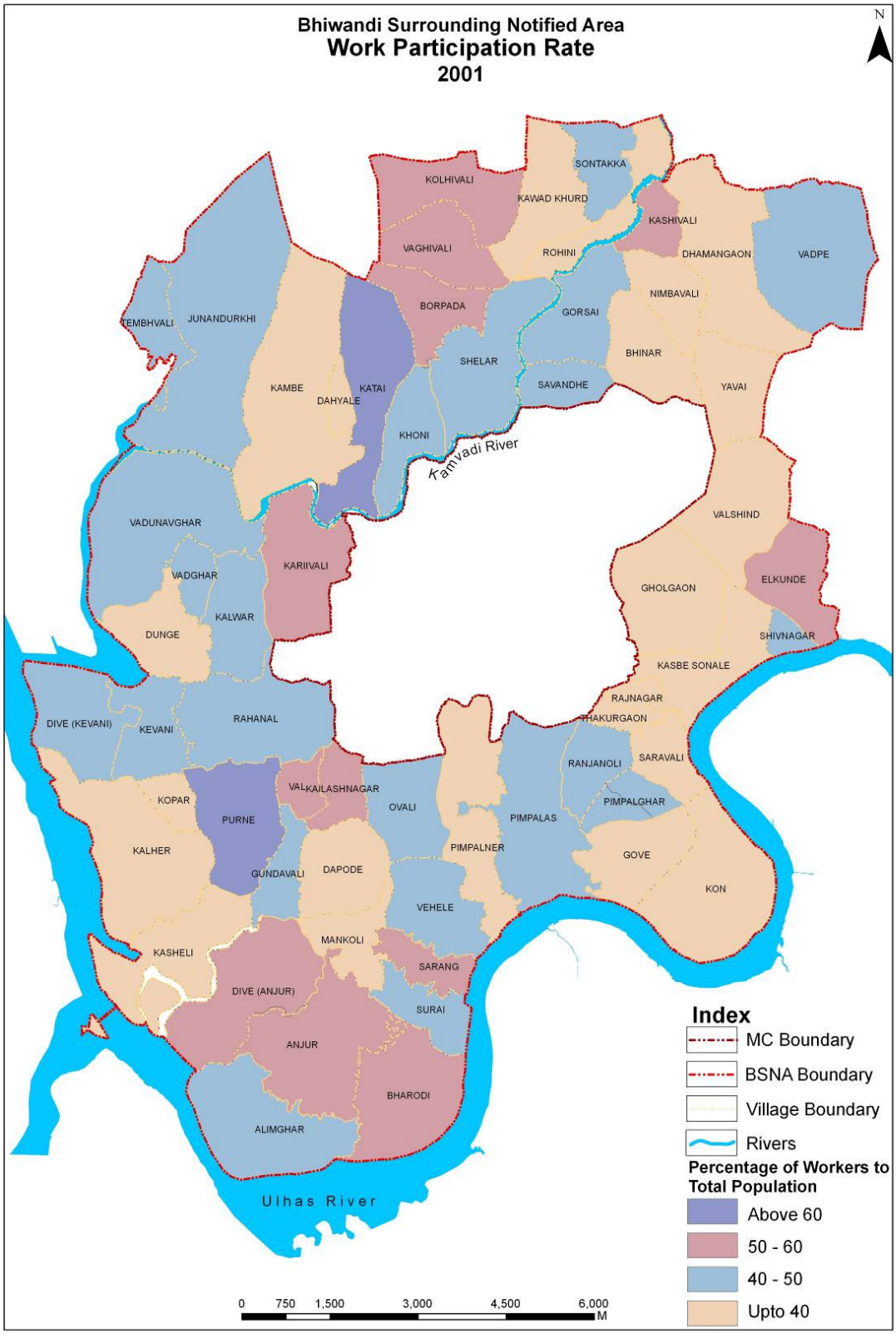


Figure 4.9 Work Participation Rate in BSNA (2001)



4.6 Summary

In BSNA, the settlements along the major roads like National Highway and State Highways experienced high growth rate as compared to others. Four villages of BSNA namely Khoni, Katai, Shelar and Kon have been categorized as Census towns. Out of these four three Khoni, Katai and Shelar are adjacent to the municipal limits of the BNMC. These settlements developed rapidly due to the expansion of Bhiwandi. Another major factor for development of villages along the National Highway and State Highway is the development of godowns & warehouses and power loom units. The Kon town has grown under the influence of Kalyan city.

The study brings out that literacy in BSNA has considerably improved, 44 per cent to 65.47 per cent during 1981-2001. The overall increase in literacy may be due to improving economic conditions and expansion of educational facilities in the area. It is observed that villages having larger concentration of godowns, warehouses and power loom units have larger population size as compared to other villages.

CHAPTER - V

EXISTING LANDUSE AND LAND VALUES

5.1 Introduction

The assessment of existing land use pattern is necessary for the preparation of development plan under Section 25 of the MR&TP Act, 1966. Thus it is necessary to carry out a survey for preparation of existing land use map. Before carrying out surveys, an accurate base map on a prescribed scale showing various existing development features such as structures, transportation network, lanes, *nallah* and other markable features like hills and rivers etc. is required.

The existing land use map of BSNA was prepared from the satellite imageries of 1M spatial and 11-bit radiometric resolution. The Quickbird satellite imageries for March 02, 2008 were used to obtain land use layers in *Arc GIS (9.2)* software. The data obtained from the imageries was through a reality check survey.

Analysis of land values based on existing land use was carried to understand the relation between existing land use and land value gives as indicative of growth and development potential of BSNA.

5.2 Existing Land Use

The BSNA comprises of 60 constituent villages. The total area of the BSNA computed on GIS platform is 144.89 Sq km. The BSNA also includes the Census towns which are part of the urban agglomeration. Table 5.1 shows the land use distribution in BSNA (Figure 5.1&5.2).

Table 5.1 BSNA: Existing Land Use Distribution (2008)

Sr. No	Land use Class	Area (Ha)	Per cent to Total BSNA
A	**Built-up Uses**		
1	Residential	525.68	3.67
2	Industrial	371.22	2.59
3	Commercial	82.77	0.58
4	Warehousing/Godowns	651.12	4.54
5	Mixed	118.08	0.82
6	Public/Semi -Public	26.94	0.20
7	Electric Sub-Stations	27.40	0.19
8	Elevated Service Reservoir	0.36	0.002
9	Water Works and Treatment Plant	36.50	0.25
10	Major Roads	75.54	0.53
11	New Structures	0.31	0.002
B	**Other Uses**		
12	Agricultural Land	8454.15	58.55
13	Forest	1303.76	9.03

14	Marshy Land	1101.68	7.63
15	Culturable But Barren Land	484.47	3.35
16	Mining Area	155.48	1.08
17	Brick Kilns	128.94	0.89
18	Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc)	458.93	3.18
19	Open Spaces and Green Belt, Water Supply Pipelines and railways	437.05	3.03
C	**Total Area**	14440.39	100.00

Source: Computed From Quick bird (MX) Remote Sensing Data

Figure 5.1: BSNA: Existing Land use (2008)

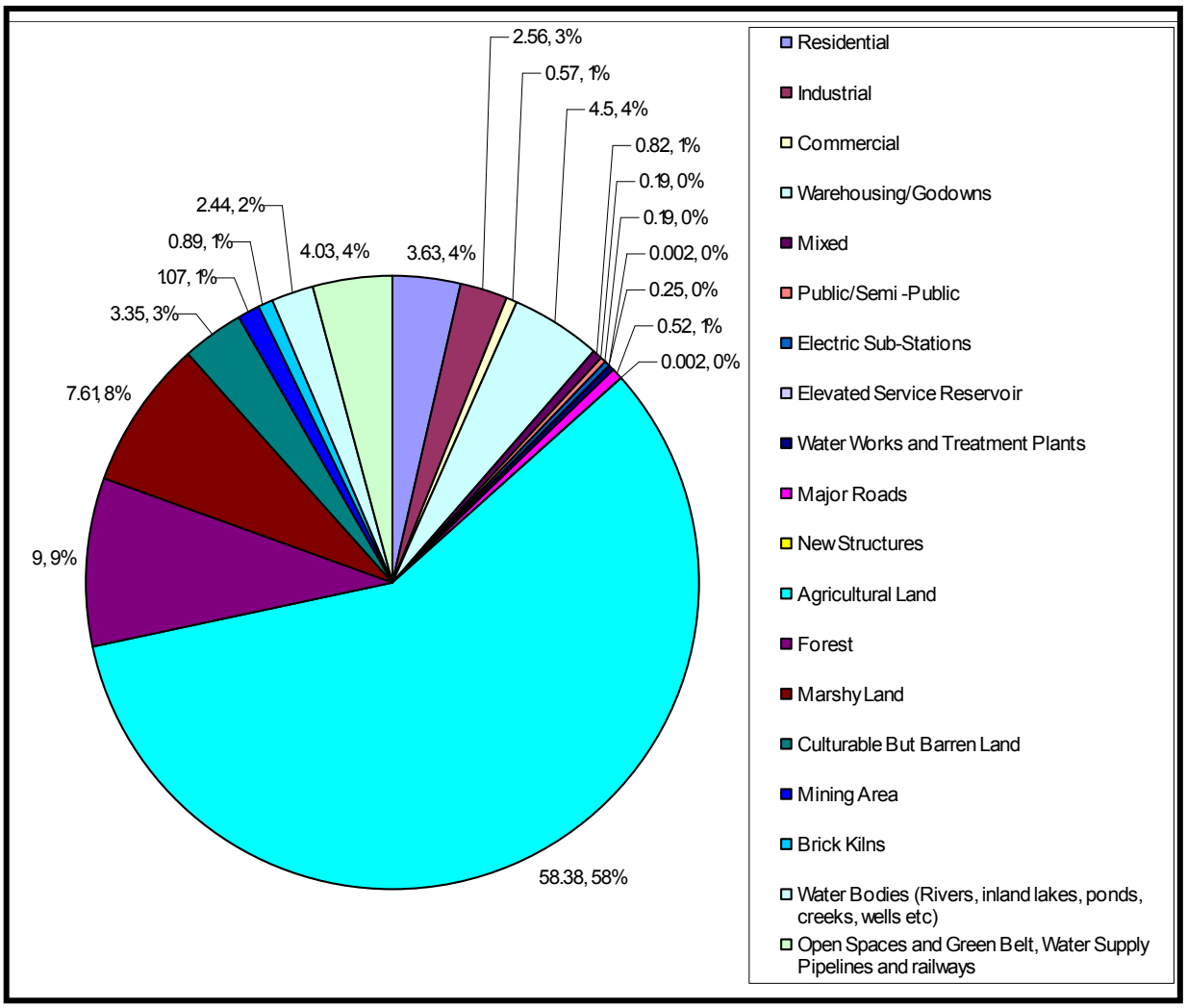
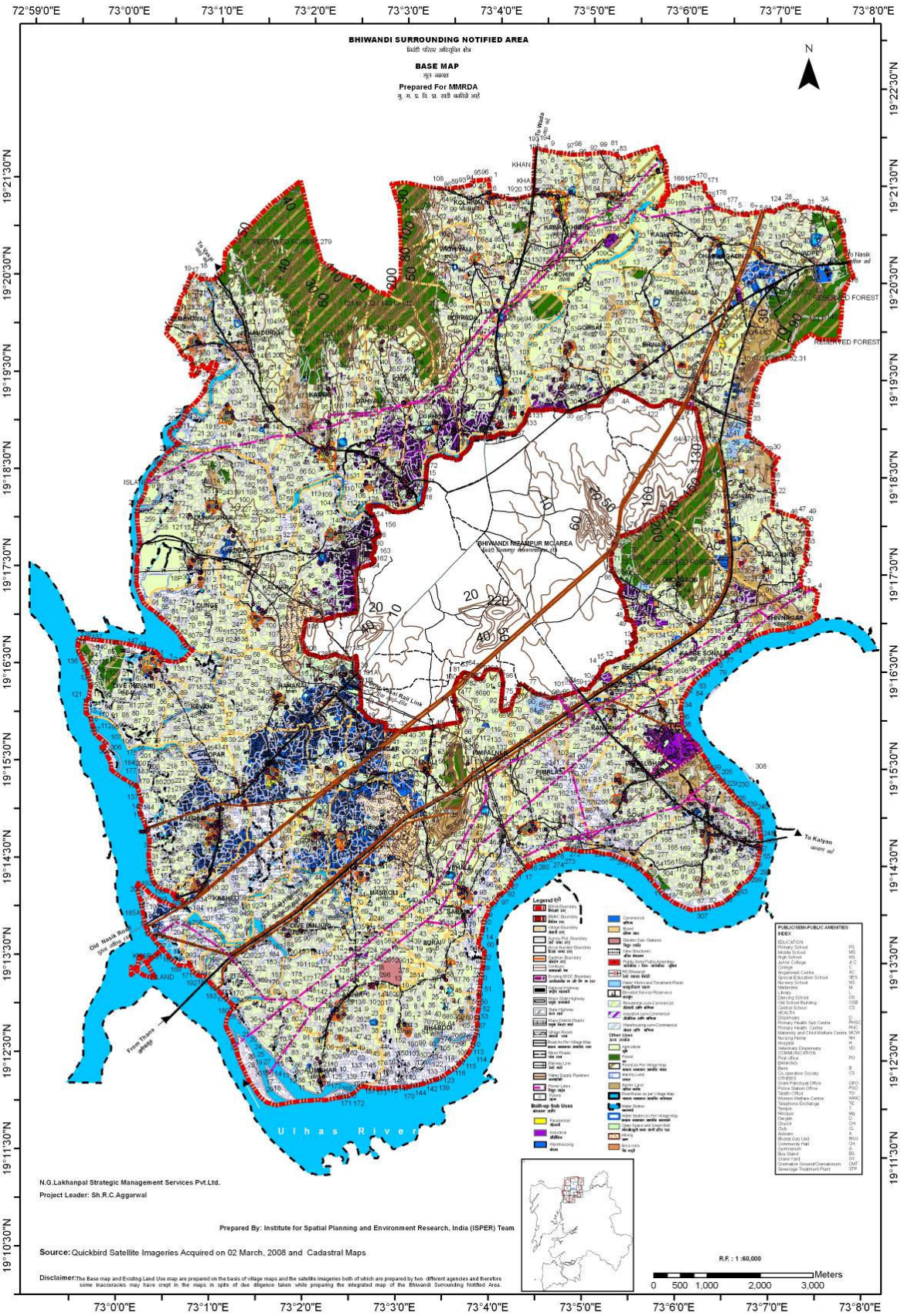


Figure 5.2: BSNA Existing Land use



It is Evident from Table 5.1 and Fig 5.1 that warehousing is the dominant land use in BSNA. The area under warehousing is about 4.54% of the total followed by the residential use, which constitutes 3.67%. The area under industrial use accounts for 2.59% of total. Fig 5.2 shows that the dominant land use i.e. warehouses or godowns/storage is largely concentrated in southwest part of BSNA. The area under public/semi-public uses include educational institutions, health care facilities, post offices, banks, co-operative societies, community halls, religious places and cremation grounds etc. measures only 27 hectares.

The dominated land use category is agricultural which covers 8454 hectares constituting about 58.55 per cent of total BSNA. Forest land constitutes about 1303 hectares which is about 9% of the total. The marshy land covers about 7.63 per cent of the total. It might be attributed to the presence of several creeks, tidal flats, mudflats and bars experiencing backlash under the influence of spring tides and rivers resulting in swampy conditions in adjacent lands. The map shows that there are detached patches of mining area observed in Mankoli and Ovali villages. The area under mining sites is about 1 per cent of total BSNA. The remote sensing data also reveals brick kilns covering about 128.94 hectares. Water bodies which include inland rivers, lakes, ponds and wells etc. cover 3.18 per cent of the total. The open spaces and green belts, water supply pipelines cover about the 3.03% of the total.

5.3 Existing Scenario of Public and Semi Public Amenities

The quality of life in any area depends on the availability and accessibility to the civic amenities. The physical location and integration of these facilities with respect to surrounding area or land use is required for framing the planning proposals. The existing development scenario of these facilities has a profound effect on the proposed land use at the BSNA level. The existing amenities also require efficient links with surrounding area. Together, these include facilities or amenities pertaining to health, education, sports, socio-cultural activities, communications, security and safety, and other community facilities pertaining to recreation, religious activities, social congregations and cremation/ burial grounds etc. These are generally planned in terms of population norms with stipulated permissibility conditions and development controls. For assessing the availability and accessibility of these amenities, a detailed joint field survey was conducted with representatives from Sub-regional office, MMRDA. Table 5.2 shows the existing scenario of public and semi-public amenities in all the constituent villages which have been duly marked on both updated base map and existing landuse map of notified area.

Table 5.2 Existing Scenario of Public and Semi Public Amenities

Sr. No	Village	Educational			Medical	Religious	Other Facilities
		Type	No.	Students	Type	No.	Name
1.	Kon	Primary(2),Middle(2), Upto12th (2),Others(2)	8	4300	1-Hospital, Nursing home, sub centre	7	Banks, Cremation Ground, Grave yard, Public toilet
2	Gove	Primary(1),others(2)	3	350		4	Gram Panchayat Office (first floor),Gym (Ground floor),Gram Panchayat meeting hall (first floor), Cremation Ground
3	Ranjnoli	Primary(1)	1	50		4	Cremation Ground
4	Pimpalghar	Primary(1)	1	50		4	
5	Pimpalghar	Primary(3),Secondary (1),Others	3	240	Dispensary(1), Sub centre	5	Community facilities centre (MIDC),Saravali Post Office within the Community facilities centre building, Public play ground (MIDC)
6	Pimpalas	Primary(1), Secondary(1), Anganwari centre	3	700	Dispensary(1), Sub centre	3	Gram Panchayat,Post Office within the house
7	Thakur gaon	Primary(1)	1	59		1	
8	Rajnagar	Primary(1)	1	61		2	
9	Saravali	Primary(1),Anganwari centre, School for Deaf & Dumb Bhairov Sevasamiti	3	297		1	Cremation Ground
10	Sonale	Primary(1),Balwadi centre(1)	2			4	Gram Panchayat Office, Community hall (Nagar Panchayat)
11	Valshind	Primary(1),Anganwari centre(1)	2			1	
12	Gholgaon	Primary(1),others(1)	2	46			Cremation Ground

13	Elkunde	Primary(1),Anganwari	2	50			
14	Shivnagar	Presidency School	1				
15	Yavai	Anganwari centre	1				
16	Vadpe	Primary(1), Anganwari centre	2			1	Gram Panchayat, Talathi saza Vadape, Post Office within the house
17	Dhamangaon	Middle(2),Secondary(1), Anganwari centre(1)	4		Hospital, PHSC	2	Gram Panchayat, Cremation Ground
18	Kashivali	Primary(1),Balwadi centre	2			1	
19	Nimbavali	Middle(1), Anganwari centre(1)	2	55		1	Gram Panchayat, Cremation Ground
20	Bhinar	Secondary(1),Middle(1), Anganwari centre(1)	3	787		1	Gram Panchayat Office, Z.P.PHSC-Centre Angaon, Gram Panchayat Community Hall (Women)
21	Savandhe	School 8th to 10^{th}(1),up to 10^{th}(1),Middle, Anganwari centre(1)	4	2158		3	Cremation Ground, Grave yard
22	Gorsai	Primary(1), Anganwari centre(1)	2	12		3	
23	Kawad Khurd	Primary(1),Middle (1) Anganwari centre (4), 4^{th} to 12^{th},Balwadi (1)	8	395		6	Women Community hall
24	Sontakka	Primary(1),4^{th}-5^{th} , Anganwari centre(1)					
25	Kolhivali	Primary(1),Anganwari centre(2)	3	149	Z.P. PHSC ,Sub-Centre	2	Gram Panchayat
26	Vaghivali	Primary(1),Anganwari centre(2)	3	158		1	
27	Borpada	Up to 7th(1), Anganwari centre(1)	2	174		1	Cremation Ground
28	Shelar	Up to 7^{th},Jr.College, Anganwari centre(3)	5	830	District Veterinary Polyclinic,Z.P. PHSC	2	Post Office in residence, Cremation Ground, Gram
29	Alimghar	Up to $7^{th,}$ Anganwari centre(1)	2	224		5	Gram Panchayat Office, Saraswati Library (private), Cremation Ground
30	Anjur	Upto 4^{th} (1) Anganwari centre(1),5^{th} to 10th	4		PSC	2	Gram Panchayat Office, Cremation Ground

31	Dive Anjur	Up to 4th (1), 8th to 12th (1), Anganwari centre(1)	3			3	Cremation Ground
32	Mankoli	Up to 7th, Anganwari centre(1)	2			3	Gram Panchayat Office, Mahila Mandal Hall,
33	Dapode	Primary, Up to 7th ,Anganwari centre(1)	3			3	Gram Panchayat, Cremation Ground
34	Gundavali	Upto 7th ,Anganwari centre(1)	2			6	Gram Panchayat Office, Library, Cremation Ground
35	Kevani	Up to 7th ,Anganwari centre(1)	2	165		3	Gram Panchayat Office, Adarsh Library in Z.P. School
36	Dive (Kevani)	Anganwari centre(1)				3	Samaj Madivhal (Mahila)
37	Kasheli	Up to 7th ,Anganwari centre(1)	2	285			Ganesh Visarjan Ghat, Cremation
38	Kalher	Up to 7th ,Anganwari centre(1).Jr. College(1),Others(4)	7	541	Z.P.PHSC Sub centre, Sai Leela Nursing Home (Mixed use), Gopiratna Hospital (Mixed use)	12	Panchayat Samiti Hall, Post Office, Shivshahi Krida Mandal,Kashi nath Baba hall, Gram panchayat Natyagrah,
39	Pimpalner - I & II	Upto 4th (3), Middle (1), Anganwari centre(1), Balwadi(1),	6	248		1	
40	Vehele	Upto 7th	1			3	PHSC sub centre
41	Sarang	Upto 4th , Anganwari Centre(1)	2	110			
42	Surai	Up to 4th , Anganwari Centre(1)	2	145		1	
43	Bharodi	Up to 4th , Anganwari Centre(1)	2	189		1	
44	Kalwar	Upto 7th ,8th to 10th,Anganwari Centre(1)	3	563		3	PHSC sub centre, Cremation Ground
45	Vadghar	Jr. College, Upto 4th, Anganwari Centre(1)	3	523			Post Office, Gram Panchayat
46	Dunge	Upto 7th ,Anganwari Centre(1)	2	397			Gram Panchayat Office, Post Office
47	Karivali	5th-8th, Upto 4th, Anganwari Centre(2)	4	779		2	Jai Bajrang Co-operative Finance Society, Child Burial Ground, Cremation Ground

48	Tembhvali	Upto 7th ,Anganwari Centre(1)	2	241	PSC	2	
49	Kambe	Upto 4th, Upto 7th ,Anganwari Centre(6)	8	1033	PSC	3	Central Bank of India
50	Dahyale	Upto 4th		30			
51	Rahanal	Upto 4th ,Upto 7th Anganwari Centre(2), Savitri bai mentally Backward School	5	3004			
52	Katai	Upto 4th(3) ,Upto 7th(1) Anganwari Centre(1)	5	477	Veterinary Dispensary	2	Post Office, Community Hall,
53	Val (Kailash nagar)	Upto 4th(1),Upto 7th(1), Anganwari Centre(2)	4	132		3	Gram Panchayat Office, Cremation Ground 2 in
54	Purne	Upto 7th (1), Anganwari Centre(2)	3	450		5	T.D.C Bank,Gram Panchayat, Cremation Ground
55	Kopar	Up to 4th (1),	1				Gram Panchayat, Cremation Ground
56	Ovali	Upto 4th(1), Anganwari Centre(2)		200		2	Orphanage Machindra Nath Maharaj Ashram
57	Vadunav ghar	Upto 2th (2), 3 & 4th(1), 5th -7th(1), Anganwari Centre(1), 8th -10th(1),	6	698		3	Community Hall
58	Junan durkhi	Upto 4th(3), Anganwari Centre(3) 8th to 10th (1), Anganwari Centre(1), 8th -10th	7	1185		2	Community Hall, Gym, Cremation Ground
59*	Khoni	Up to 4th(2), Up to 7th(1), Up to 6th(1), Up to 9th(1), Pharmacy College(1),Anganwari Centre(1),	7	2634	Sai Nath Hospital	12	Nagarik Sewa Co-operative Bank, Sewerage Treatment Plant, Burial Ground/

*Source: Field Survey * Rohini the 60th village newly carved out of Kawadkhurd*

Table 5.3 depicts total number of public/semi-public amenities and students in educational institutions. Integration of public/semi-public amenities has been achieved by identifying and verifying on ground, transferring on cadastral map and then on the existing land use map. Figure 5.2 shows the village wise spatial distribution of public and semi-public amenities on base map and existing land use map of BSNA. Table 5.3 shows the total number of public/semi-public amenities in the BSNA. Table 5.4 shows that BSNA lacks in higher educational facilities both general and technical. Only five educational institutes are imparting education at 10+2 (Junior college) levels. These are located in 5 villages.

Table 5.3: Distribution of Public/Semi-Public Amenities in the BSNA

Sr. No.	Amenities	Total Number	Population served
1	Educational	173	25174
2	Medical	22	-
3	Religious	145	-
4	Banks	3	-
5	Others*	84	-
	Total	**425**	

** Gram Panchayat offices, Cremation ground/Burial ground, Banks, Community hall, Post office, Gym, Talathi office etc.*

Table 5.4 Distribution of Higher Educational Amenities

Sr. No.	Name of Village	Type of Educational Institute
1	Kon	Junior College
2	Shelar	Junior College
3	Dive Anjur	8th to 12th
4	Kalher	Junior College
5	Khoni	Technical Institute and Pharmacy College

The higher educational facilities in BSNA lack in terms of quantity and the availability (connectivity).The graduate and post graduate level institutes are altogether missing in the area.

The integration of public amenities was achieved by identifying the physical structures with their location corresponding in CTS numbers. The marking of these amenities on the existing land use map provides the information about the surrounding land use. Figure 5.2 shows the spatial pattern of these amenities in the notified area.

Table 5.5 Utilities and Services in the BSNA

Sr. No.	Name of Village	Amenity	Number
1	Ovali	Water works/treatment	1
2	Pimpalas	Water works/treatment	1
3	Vaghivali	Water works/treatment	1
4	Yavai	Water works/treatment	1
	Sub total		**4**
5	Kambe	Electric Sub- Station	1
6	Anjur	Electric Sub- Station	1
7	Pimpalas	Electric Sub- Station	1
8	Yavai	Electric Sub- Station	1
9	**Sub total**		**4**
	Katai and Khoni	Sewage Treatment Plant(STP)	1
	Total		**9**

Source: Joint Field Survey and Quick bird Satellite Imageries

Table 5.5 shows the existing scenario of utilities and services in the BSNA. The Figure 5.2 showing existing land use map also portrays the location of these utilities and services in the BSNA. The existing water works located in BSNA are not catering to the population of Bhiwandi city only, but also serving the population of Mumbai and other surrounding areas. These water works are mainly set-up along the water supply pipe lines (Tansa water supply pipelines).The

water is treated and distributed from these locations. In all there are 4 water works in four villages of BSNA namely Ovali, Pimpalas, Vaghivali and Yavai. There are four electric sub-stations of different capacities and are located in villages Kambe, Anjur, Pimpalas and Yavai. There is only one Sewage Treatment Plant in the entire BSNA located on the border of Katai and Khoni villages. The STP is largely treating the waste generated by the industrial units. The remaining area lacks in such kind of sewerage treatment plants in the presence of large scale industrial units.

5.4 Compatibility of Land Use

The compatibility of land use is an essential component for assessing the qualitative aspect of land use. The existing land use of the area shows that there are some land uses which are not compatible with the surrounding land uses. Kalher, Purne, and Rahanal villages have a mixing of residential area with warehousing. Some residential areas have mingled with industrial use creating several problems to the residential area.

5.5 Land Value

Land value is an important aspect of determining future land use. It provides information about land price variation from area to area. Urban development cannot be sustainable (economical) if not involving self-generating finance capacity for resource mobilization. So far as the BSNA is concerned, Department of Chief Controller of Octroi Authority has given the land value in BSNA villages in the form of influence area (Table 5.6). The department has identified 16 villages as the influence area. Rest of the BSNA area falls under the rural area as per land value categorization of the area.

Table 5.6 BSNA: Land Values in the Influence Area (Rupees per Hectare)

Sr. No.	Name of Village	Legal non agricultural Land	Commercial	Industrial/ Warehousing
1	Khoni	1,000	10,500	8800
2	Gove	570	9000	8000
3	Purne	1100	10500	8800
4	Pimpalgaon	600	9000	8000
5	Pimpalghar	600	9000	8000
6	Rahanal	1270	9000	8000
7	Ranjnoli	630	9000	8000
8	Val	830	9000	8000
9	Kambe	640	9000	8000
10	Katai	860	9000	8000
11	Kon	830	10000	9000
12	Kopar	1140	11300	9400
13	Shelar	640	9000	8000
14	Borpada	640	9000	8000
15	Savandhe	640	9000	8000
16	Sonale	640	9000	8000

Source: Inspector General of Registration &Controller of Stamps, Pune

Figure 5.3 BSNA: Influence Area as Per Land Value

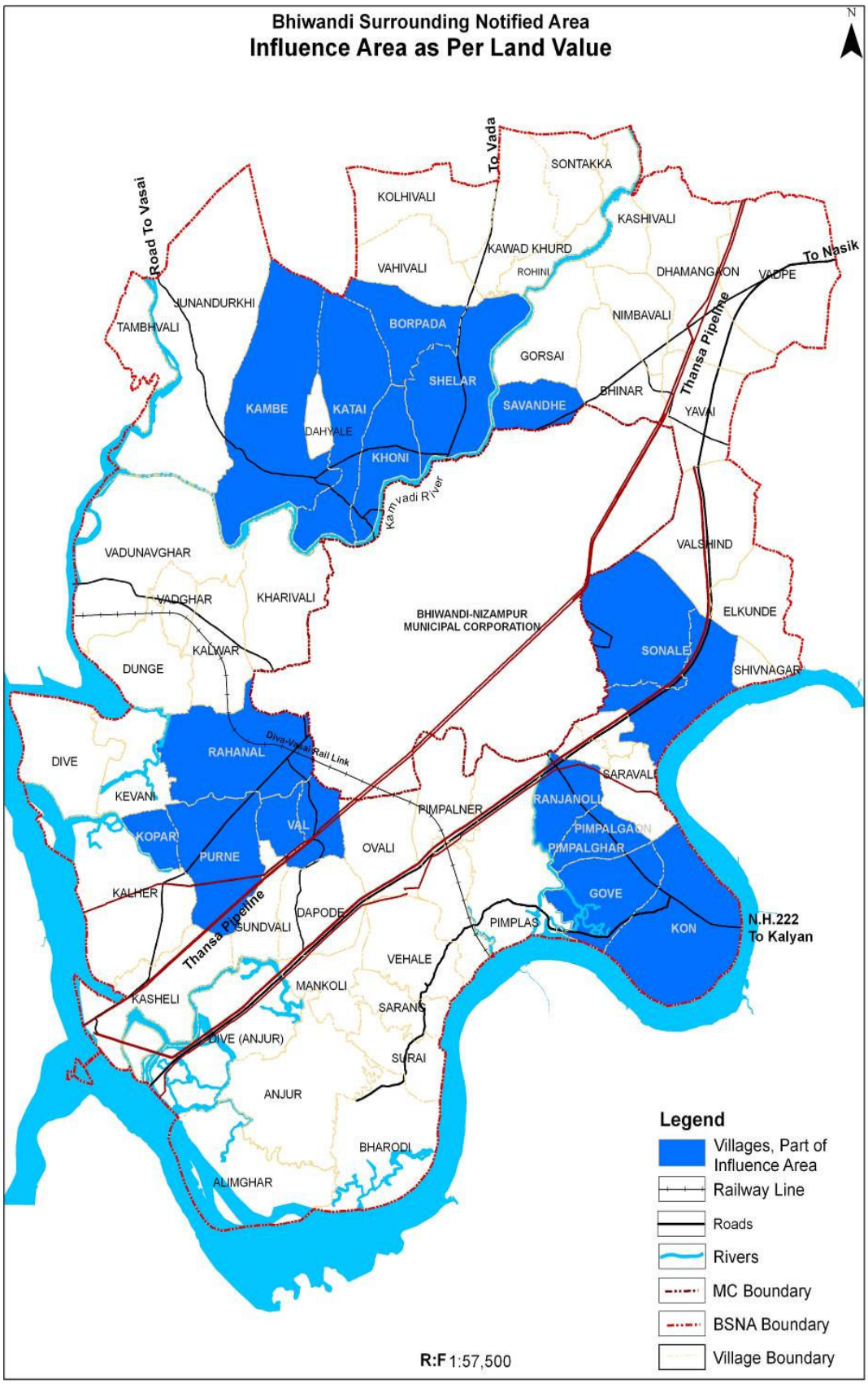


Figure 5.3 shows the land values in BSNA. The influence area includes all census towns namely Kon, Shelar, Katai and Khoni. Other villages include Rahanal, Kopar, Purne and Val in the centre of BSNA and Sonale, Ranjnoli, Pimpalas and Pimpalgaon. The remaining villages have been considered as rural area on the criteria of land value.

5.6 Wetland Analysis

BSNA has 38.01 km long coastline demarcated by Ulhas and Kamvadi rivers in the south and west, respectively. This part is indented with minor creeks, estuaries and bays. The interior coastline consists of mudflats, marshes, mangroves, exposed rocks and pebbled beaches, etc. Wetlands are considered highly productive and valuable from the point of view of flood controls, shoreline stabilization, providing habitat to flora and fauna, retention of sediments, nutrients and toxicants and providing food chain support. The wetlands are also converted into agricultural land through *khar*-land development programme. Apart from this, wetlands are used for production of salt, fish and dumping of solid waste.

Marshy/wetland accounts for 7.63 per cent of total BSNA. It is noted that 35 villages out of 60 villages of BSNA come under the category of coastal villages for which the CRZ notification issued by Ministry of Forests and Environment, Government of India applies. The area under wetlands as per the coastal land use map prepared by Maharashtra Remote Sensing Applications Centre and Space Applications Centre, ISRO, Ahmadabad is 22.14 sq km. The village wise area under wetlands computed from coastal land use maps is given in Table 5.7**.** There is a wide difference in area under wetlands calculated from Quick bird imageries (2008) and Coastal Land Use Map. This difference may be attributed to reclamation of wetlands for agricultural and other uses. Some detached patches of wetlands in BSNA are covered with mangroves, particularly on the bank of Ulhas River.

Table 5.7 BSNA: Distribution of Area under Wetlands in Constituent Villages

Sr. No	Name of Village	Area(Sq Km)	Wetland Area (Sq Km)	Percent to Total Area
1	Alimghar	4.04	2.9	71.78
2	Bharodi	2.9	2.6	89.65
3	Dive Anjur	3.4	2.2	64.70
4	Dunge	2.0	0.5	25.00
5	Gorsai	2.33	0.20	8.58
6	Gove	2.18	0.90	41.28
7	Gundavali	1.02	0.10	9.80
8	Junandurkhi	7.95	0.64	8.05
9	Kalher	5.22	3.0	57.47
10	Kalwar	2.01	Nil	0.00
11	Kambe	5.52	0.30	5.43
12	Karivali	3.34	0.50	14.97
13	Kasheli	3.6	Nil	0.00
14	Kashivali	1.16	Nil	0.00
15	Katai	3.56	0.20	0.50
16	Kawadkhurd	5.33	0.2	3.77
17	Kevani	1.89	0.30	15.87
18	Khoni	1.80	0.2	11.11

19	Kon	5.55	2.30	41.44
20	Kopar	0.68	Nil	0.00
21	Pimpalas	4.48	1.8	40.17
22	Pimpalghar	0.99	0.10	10.00
23	Pimpalner	3.26	0.60	18.40
24	Purne	2.73	0.30	10.98
25	Rahanal	3.62	Nil	0.00
26	Rajnagar		Nil	0.00
27	Ranjnoli	1.34	0.50	37.31
28	Saravali	1.38	0.0004	0.02
29	Shelar	5.27	0.40	7.59
30	Shivnagar	0.46	0.20	43.47
31	Sonale	2.93	Nil	0.00
32	Tembhvali	1.45	Nil	0.00
33	Vadghar	0.74	Nil	0.00
34	Vadunavghar	5.49	1.00	18.21
35	Vehele	6.44	0.20	3.10
Total		**106.06**	**22.14**	**20.87**

*Source***:** *Coastal Land Use Maps prepared by Maharashtra Remote Sensing Applications Centre and Space Applications Centre, ISRO, Ahmedabad*

Table 5.7 indicates the maximum area of wetlands in Bharodi which is about 90% of the village land followed by 71.78% in Alimghar village. Dive Anjur has about 65% area under wetlands and Kalher 57%. Nine out of 35 villages namely Kalwar, Kasheli, Kashivali, Kopar, Rahanal, Rajnagar, Sonale, Tembhvali and Vadghar covered under Coastal Regulation Zone do not possess any wetland.

5.7 Summary

The foregoing analyses of land use indicate that BSNA has a distinct land use character comprising lands under agricultural, costal/wet, cultivable barren, quarries, forests, concentrations of godowns/warehouses, industries etc. The maximum land of BSNA is agricultural which constitutes about 58.55% of the notified area. The area under forest cover is 9.03% closely followed by wet/marshy land (7.63%). The area under wetlands based on CRZ notification accounts for about one-fifth of total notified area.

A glance at built-up uses indicates that the highest proportion of land (4.51%) is devoted to warehousing/godowns. The land under residential use is 3.64% and under the industrial uses is 2.57%. The land under public/semi-public uses which include educational institutions, health care facilities, post offices, banks, co-operative societies, community halls, religious places and cremation grounds etc. is very small (0.19%). The study reveals that BSNA lacks in terms of higher educational facilities both general and technical. There are only five educational institutes imparting education at senior secondary (Junior College) level.

The existing water works located in some parts of BSNA are catering to Bhiwandi, Mumbai and other surrounding areas. In all there are 4 water works in four villages of BSNA. There are four electric sub stations with different capacities located in Kambe, Anjur, Pimpalas and Yavai villages. There is only one Sewage Treatment Plant in the entire BSNA located on

the border of Katai and Khoni villages. The remaining area lacks in this kind of sewerage treatment plants even in the wake of growing industrialization and urbanization in the area.

The mixed-use category covers a little less than 1% land of the BSNA. The land put under mixed use includes residential, commercial and industrial. The availability of large chunk of land under cultivable but barren is 3.35%, which could be used for development purposes. The land under quarrying is 1.08%, which needs to be reclaimed; otherwise it would threaten the delicate ecological cover of BSNA. The area under water bodies is 3.18% whereas area under open spaces and green belts including water supply pipelines and railways is about 4.03%.

The land values in BSNA are determined ranging from Rs. 8000 to 9400 per hectare for industrial/warehousing purposes and Rs. 9000 to 11300 per hectare for commercial activities which are quite low in view of BSNA potentials.

The study reveals that area under wetlands as per CRZ notification is 22.14 sq km which comprises about one-fifth area of coastal villages, which is at variance to the data, obtained from the imageries. CRZ area needs reconciliation in view of ground realities.

CHAPTER - VI

HOUSING

6.1 Existing Scenario

Housing is the process of providing shelter to people. It provides sense of security possession and status. It also offers tremendous employment opportunities to the construction sector. BSNA being a green field project is the hope future investments and employment. The existing land use of BSNA shows the dominance of a large number of power looms, godowns/ warehouses whereas private housing by developers or public sector is negligible in BSNA.

Bhiwandi is predominantly a workers' city so are census towns of BSNA surrounding it. Lack of affordable shelter in Bhiwandi has resulted in the growth of slums. About 2,000 huts in 1971 increased to 26,000 huts in 1991. Out of the 27 slum pockets in Bhiwandi, 20 slums pockets have been notified as slums by the Government. The BNMC has not taken initiatives in of relocation or redevelopment of slum pockets.

Bhiwandi city, Khoni and Katai villages of BSNA have experienced a massive land use transformation with almost every third/forth houses having powerlooms or dyeing activities in the residential zone. As per the Sanctioned Development Plan for Bhiwandi (1976), the Mixed Use Zone had a permissible FSI of 0.5. The supply of land was restricted and could not satisfy the growing needs of the rapid industrial growth instigated by the power loom industry. Permission obtained for residential development was partially or fully used for setting up powerlooms.

6.2 Qualitative Aspects

The qualitative aspects of housing are measured in terms of the following criteria:

I. Occupancy Rate,
II. Availability of utilities and services,
III. Planned/Unplanned,
IV. Accessibility,
V. Materials Used,
VI. Size of Houses,

Occupancy rate can be measured in terms of either floor area per head or the number of persons per dwelling unit. According to 1981 Census, the population of Bhiwandi city was 1,15, 298 persons and that BSNA was 79, 242 persons. The total households in Bhiwandi city were 19, 511 and 14, 696 in BSNA. This shows the occupancy rate of 5.9 persons per house in the city and 5.3 persons per house in BSNA in 1981. According to 1991 Census the population of Bhiwandi city and BSNA was 3, 79, 070 and 1, 14, 349 persons, respectively. Total number of households in Bhiwandi city and BSNA were 70, 080 and 21,726, respectively. The occupancy rate was 5.4 and 5.2 persons per house in city and BSNA, respectively. In 2001 the population of city and BSNA was 5, 98, 741 and 1, 68, 411, respectively. Total households were1, 10, 408 in the city and 33, 359 in BSNA. The occupancy rate was 5.4 and 5 persons per house,

respectively. This shows that the occupancy rate was the highest in 1981 in term of both urban and rural areas. The average occupancy rate in the MMR and Greater Mumbai is 4.5 persons per houses. The occupancy rate is higher in BSNA than that of MMR.

6.3 Availability of Utilities and Services

The total number of water supply connections are 49, 903 against 1, 10, 408 households. The data shows that only 45 percent houses are served by water supply connections.

I. Water demand in the urban area is 125 MLD against the available 112 MLD for the city,
II. BSNA has the problem of safe water supply.
III. The area served by the sewerage network covers only 450 hectare against the total area of 2600 hectare in the city.
IV. The total population served by sewerage network is 2.5 lakhs and a large part of sewage is directly flowing into the Rivers.
V. The biggest problem in the area is lack of correlation between the increase in population and housing stock with the availability of the public infrastructure.
VI. There are only 18 banks in BNMC, which are not sufficient for the city and the surrounding population.
VII. BSNA is rapidly growing as a centre of power loom industry and warehousing. The economic activities are attracting population from other areas. This factor has created the demand for housing.
VIII. The irregular power supply system has become order of the day.
IX. The constructions/structures raised in the low lying lands have the severe problem of flooding during the monsoons and due to the backlash of marine water through creeks.
X. Rural settlements in BSNA suffer from poor accessibility particularly during the rainy season.

6.4 Planned/Unplanned Housing

The area has very small number of formal housing. The sector housing or the low-cost housing is not initiated by the Public Housing Agency like MHADA (Maharashtra Housing and Area Development Authority). The area supports a large number of migrant population which need planned or low cost housing. Growth of slums within the BNMC is due to this reason. The total population residing in these slums is 1, 22,621.

6.5 Accessibility

There are problems of accessibility in BSNA. The data at the BNMC level reflect that only 3.11% of the total area is meant for circulation, or the movement of people and vehicles. The total road length available per 1000 persons is 0.19 km, which is very low (BNMC). The accessibility in the BSNA is reflected through the availability of safe rural linkages. Although the

rural links are largely available but have the problem of floods during the peak monsoon season. The rural links become inaccessible during this period. The total numbers of households affected due to the floods in BSNA are given in Table: 6.1.

Table 6.1 Total Number of Household Affected from Floods

Sr. No.	Name of Villages	Total No. of Households
1	Alimghar	639
2	Anjur	577
3	Bharodi	202
4	Dive	240
5	Dunge	316
6	Gove	592
7	Kasheli	459
8	Kevani	359
9	Kon	555
10	Pimpalas	580
11	Pimpalghar	246
12	Sarang	128
13	Surai	230
14	Vehele	418
	Total	**5641**

Sources; Primary Census Abstract, 2001

Table 6.1 shows that 5641 households in 14 villages in BSNA suffer problems of accessibility during the peak monsoon season.

6.6 Material of Construction

Figure 6.1 Housing Material Used in Rural Area

The construction materials used in BSNA is of both type i.e. bricks and mortar and mud brick huts (Figure 6.1). These huts have less durability due to poor quality as compared to brick masonry. BSNA saw heavy rain, which coupled with the decision of the authorities to release overflow from Barvi Dam, caused flood waters to rise more than 10 feet. *(Environment Status Report 2006-07).* The building material does not support the disasters that occur in BSNA.

6.7 Occupied Residential Houses

In 1981 Census the total number of occupied residential houses in the city was 18856 (96.4%) as against the 19511 total numbers of houses. In 1991, the total number of occupied residential houses was 65929 against the 70080 total numbers of houses. The percentage of occupied residential houses to the total was 98.3%. The data reflect the increase in the housing demand in a decade in the area.

6.8 Density of Dwelling Units

In BSNA, the density varies from village to village. Some villages have higher housing density than others such as census town Khoni has 20 houses per hectare and) Karivali has the lowest of 0.3 of a house per hectare. Table 6.2 shows villages grouping of housing density.

Table 6.2 Housing Density in the BSNA

Sr. No.	Housing Density (No. of Houses Per Hectare)	No. of Villages
1	Upto 1	14
2	1-2	22
3	2-4	10
4	4-8	9
5	8 and above	1
6	Total	56

Sources: Primary Census Abstract, 2001

6.9 Present Housing Shortage

I. Total housing demand in 2001 (BSNA) =1, 53, 430 houses.

II. Total number of houses in 2001(BSNA) =1, 43, 767 houses.

III. The shortage number =9, 663 houses.

6.10 Assessment of Future Housing Demand

The assessment of future housing demand is based on assessment and population planned for.

6.11 Affordability

The affordability of housing is required for translating the need into effective demand income level. This requires the availability of land, low construction cost, availability of housing finance etc. The income level gives the idea of affordability profile of people. The household income distribution and projections can be translated into affordable housing budget estimating credit-raising capacity of household of different income groups based on the monthly loan repayment that depend upon household savings. The income distribution gives the idea about

the affordability profile of people. The following categories have been taken for the assessment of affordability level.

6.11.1. Income Level

Income level is the major determinant for assessing the level for housing. It relates to the capability of the people to get house and fund raising capacity. The income data for Bhiwandi shows a high percentage of middle-income employed persons whose monthly income is between Rs. 3000-5000 and Rs. 5001-10000 (Table 6.3). The average monthly income level of the people is 8000 rupees.

Table 6.3 Income-wise Percentage of People (year2005)

Sr. No.	Income Categories	Percentage of People	Total Households
1	0-1500	3	4314
2	1501-3,000	5	7189
3	3,0001-5,000	32	46006
4	5,001-10,000	27	38818
5	10,001-20,000	26	37380
6	20,001-30,000	6	8621
7	30,001-40,000	1	1439
	Total	100	143767

Source: Comprehensive Transportation Study for MMR

6.12 Summary

Bhiwandi and certain pockets of BSNA is the hub of power looms, handlooms, godowns/ warehouses. Thus, it is also considered as the workers' town/city. The migrant population also needs shelter. There are 27 slum pockets at different places in Bhiwandi having a total population of 1, 22, 621 persons. However, 20 slum pockets are notified slums by the Government. This situation arose due to the growing number of lower income working population who cannot afford a house and have to live in unhygienic conditions. The occupancy rates in the BSNA are higher than the rest of the MMR and about additional 10,000 houses are observed to be required. In the villages Khoni and Katai, the living standard of people in clusters is very poor. The household income of about one-third (32%) varies from 3000-10000 rupees per month and about 8% population is below poverty line and are not able to afford a house. The proposals should take care of flood control measure for better accessibility of villages.

CHAPTER-VII

SOCIAL INFRASTRUCTURE

7.1 Social Infrastructure

Provision of social infrastructure is necessary to achieve the objective of growth and social development and for creating environment for human well being. Accessibility to social infrastructure is one of the major indicators to assess quality of life in urban settlements. For effective distribution, social infrastructure has been categorized into city facilities and community level facilities. These facilities together, include Health, Education and Socio-cultural activities, Recreation, Religious activities, Social Congregations, Cremation/ Burial Grounds etc.

7.2 Educational Facilities in BNMC

The city has 130 schools out of which, 75 are run by the Municipal Corporation, while the rest are privately managed. Out of the 55 privately run schools, only 13 receive Government grants. These schools together with a staff of about 1,000 school teachers accommodate about 75,000 students. The guidelines as laid down and revised by Government of Maharashtra prescribe a standard of 15% of the total population for arriving at the total student population studying in class I to VIII. As per these norms, the present day total student population works out to be 1, 12,500 indicating a deficiency in the educational facilities.

Bhiwandi-Nizampur has 42 Secondary Schools catering to the educational needs of about 36,000 students. The Government of Maharashtra prescribes a standard of 7.5% of the total population for computing the secondary school going population that works out around 56,250. Bhiwandi-Nizampur has 3 degree colleges, 1 technical school and 2 technical institutes (Figure 7.1). These can be compared with the provisions of Delhi Master Plan 2021, Table 7.1.

Table 7.1 Planning Norms and Standards for Educational Facilities

Sr. No	Category	Population/Unit
1	Vocational Training Centre/ITI/Management Institute etc.	5.0 Lakh
2	General College	5.0 lakh
3	Professional College	5.0 lakh

Sources: Delhi Master Plan Document-2021

The area is lacking the facilities of Professional Colleges, which are necessary, as the area has population of more than five Lakhs. Educational facilities in rural area are required for overall development of society. Available educational infrastructure in BSNA can be assessed from the following (Table 7.2).

Table 7.2: BSNA Educational facilities

Sr. No.	Primary School	Middle School	Secondary	Other Educational Institute
1	49	26	12	22

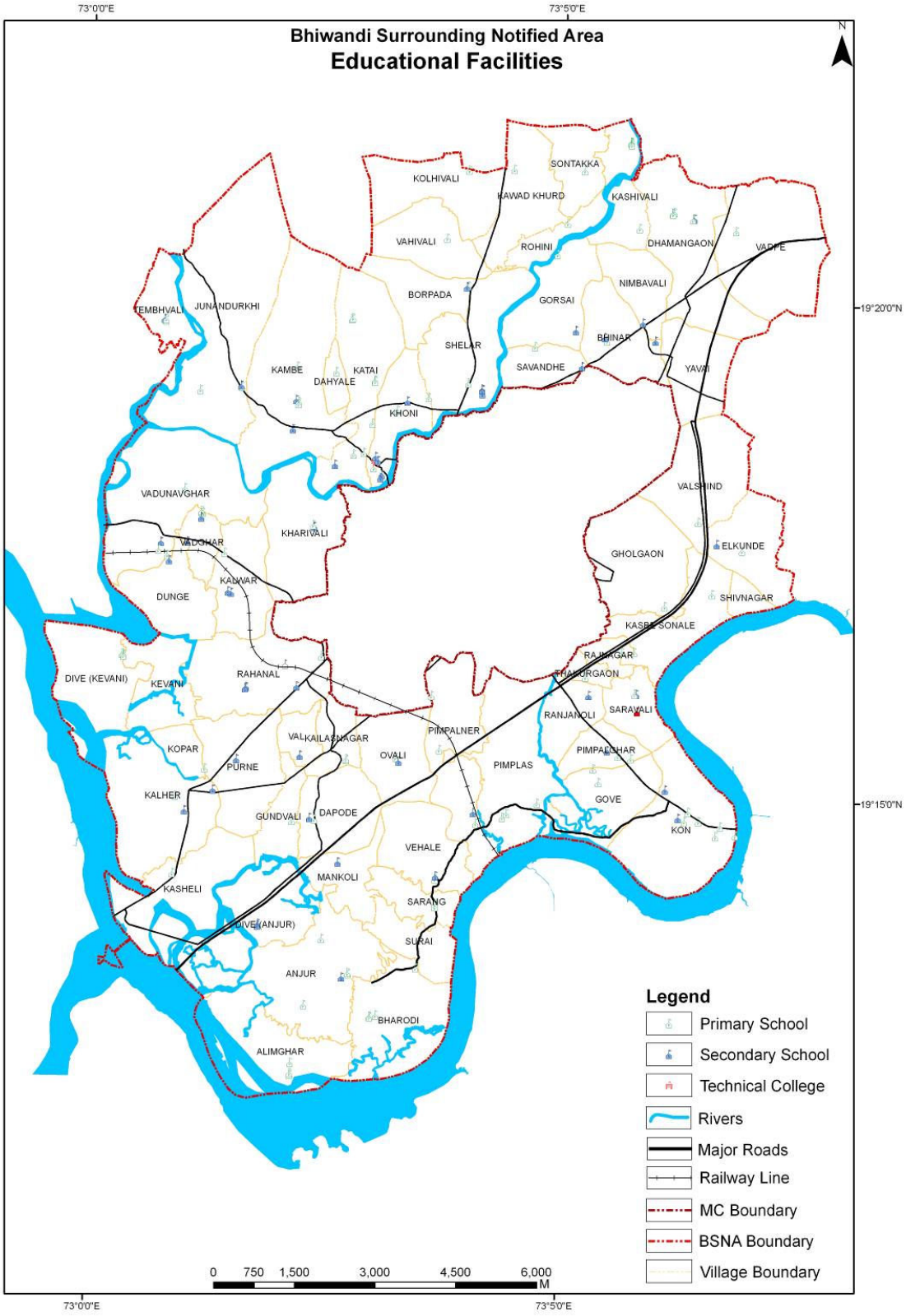
Sources District Census Handbook, Thane, 2001

As mentioned earlier there are 60 villages in BSNA. As per the information available, it may be safely inferred that all the villages do not have the facility of a primary school (. The total number of primary schools in the BSNA is 49. The primary educational facility should be in each village. Figure 7.2 shows the spatial distribution of educational facilities in BSNA. The middle schools are distributed almost all over the area and cater to the students of either two or in some cases three villages at a point. The distribution of the secondary schools is not satisfactory. The total population of the BSNA is 1, 65000.The total number of secondary schools is 12 and one school serves 13750 pupils. As per the UDPFI standards, there should be one secondary school per 10,000 population. On the other hand, the whole area is not served by secondary schools as far as the distribution is concerned. The higher educational institutions are very small in number. There is only one institute of technical education at Khoni. There are no other professional colleges in the area. Bhiwandi city has only three-degree colleges, one technical school and two technical institutes. The students have to go to Thane for seeking higher-level education like B.ED, M.ED, and for engineering courses.

It may be concluded from the educational facilities available in the BSNA that:

I. Every village is not served by primary schooling facilities.
II. The secondary schools are not properly distributed in BSNA.
III. BSNA lacks in technical schools and institutes.
IV. Bhiwandi city located in the vicinity of BSNA also lacks in professional institutes.

Figure 7.1: BSNA- Location of Educational Facilities



7.3 Health

Bhiwandi-Nizampur with its growing population needs better health facilities. Deficient health facilities hamper the growth potential of the area as large section of population are under worker‘s category. BNMC recognizes health management as a priority and efforts are being made to monitor and provide support to both public and private sector hospitals within the city limits.

7.3.1 Existing Health Facilities in Bhiwandi-Nizampur

The city has 76 hospitals out of which 75 are private while only one hospital is administered by BNMC. There is no hospital run by the State or Central Government in the city. The city has 377 dispensaries out of which BNMC administers 1 while 376 are privately managed. Apart from this basic health infrastructure, the Municipal Corporation also runs 10 health centers. The total number of beds available (Private and Public Health facilities taken together) is about 1,037 i.e., approximately one bed per 700 people. The present availability of beds is far less than what has been prescribed by the Health Ministry. There is also no specialty hospital for higher-level medical facilities in the city and citizens of Bhiwandi and BSNA are dependent on Mumbai city for the facility. These can be compared with provisions of Delhi Master Plan 2021 (Table 7.3).

Table7.3 Planning Norms for the Health Facilities

Sr. No.	Category	Population/unit
1	Hospital A (501 beds and above)	5.0 lakh
2	Other Facilities	-
i	Maternity Home	1 per 0.5 lakh
ii	Family Welfare Centre	1 per 0.5 lakh
iii	Veterinary Hospital for animals and birds	1 per 5 lakh
iv	Medical College	1 per 10 lakh

Source: Delhi Master Plan Document-2021

The area requires the above facilities as per the population standard as adopted by the DMP-2021.The area requires the facility of a veterinary hospital, maternity home, family welfare centre etc.

7.3.2 Health Facilities in BSNA

The medical facilities in the rural area are very necessary, so that the people are treated near their residence. The development of health facility is an indicator of social development. The total numbers of health facilities in the BSNA are shown in Table 7.4.

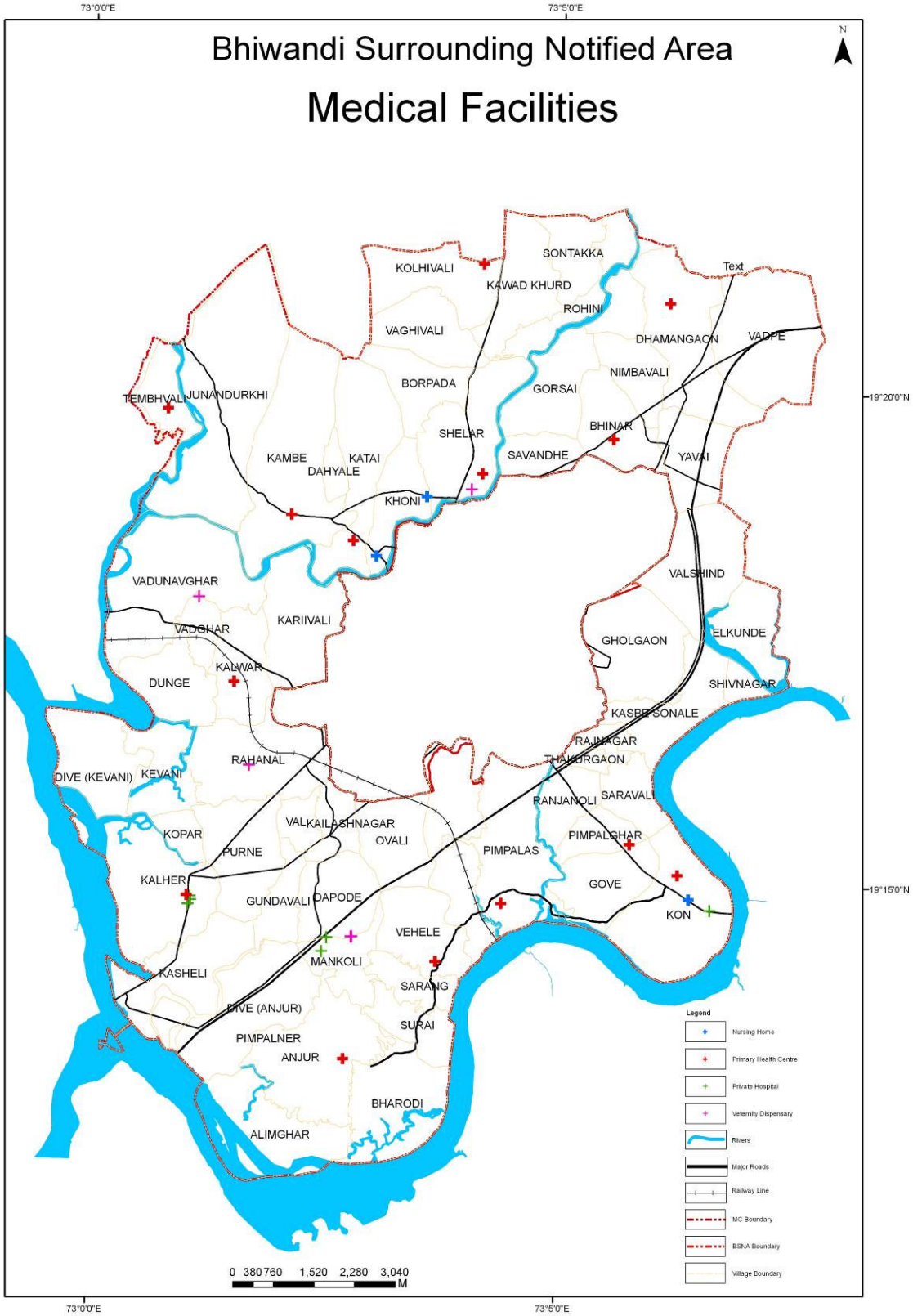
Table 7.4 Existing Health Facilities in the Villages

Public Health Services	Hospital	Public Health Centre	Dispensary	TB Clinic
14	1	1	18	2

Sources District Census Handbook Thane, 2001

There is only one hospital in BSNA, located in village Purne. The total number of public health services in the area is 14. Only one hospital cannot serve the whole population of the area. There is only one Public Health Center in village Dive Anjur. The spatial distribution of health facility is very important for assessing the service area of the medical facility. Some villages in the area have multiple dispensaries depicted inter-alia in the figure 7.2.

Figure7.2: BSNA-Location of Medical Facilities



There are some villages namely Vadpe, Sonale, Vadunavghar and etc. from where people have to travel a long distance for seeking the medical treatment.

Table 7.5: The Villages having Multiple Dispensaries

Sr. No.	Name of Village	Number of Dispensaries
1	Kasheli	5
2	Kalher	4
3	Kambe	2
4	Kawadkhurd	2

Sources District Census Handbook Thane, 2001

It is evident from Table 7.5 that 4 villages in the BSNA alone enjoy multiple medical facilities. Kasheli village alone has a five dispensaries and Kalher has four dispensaries

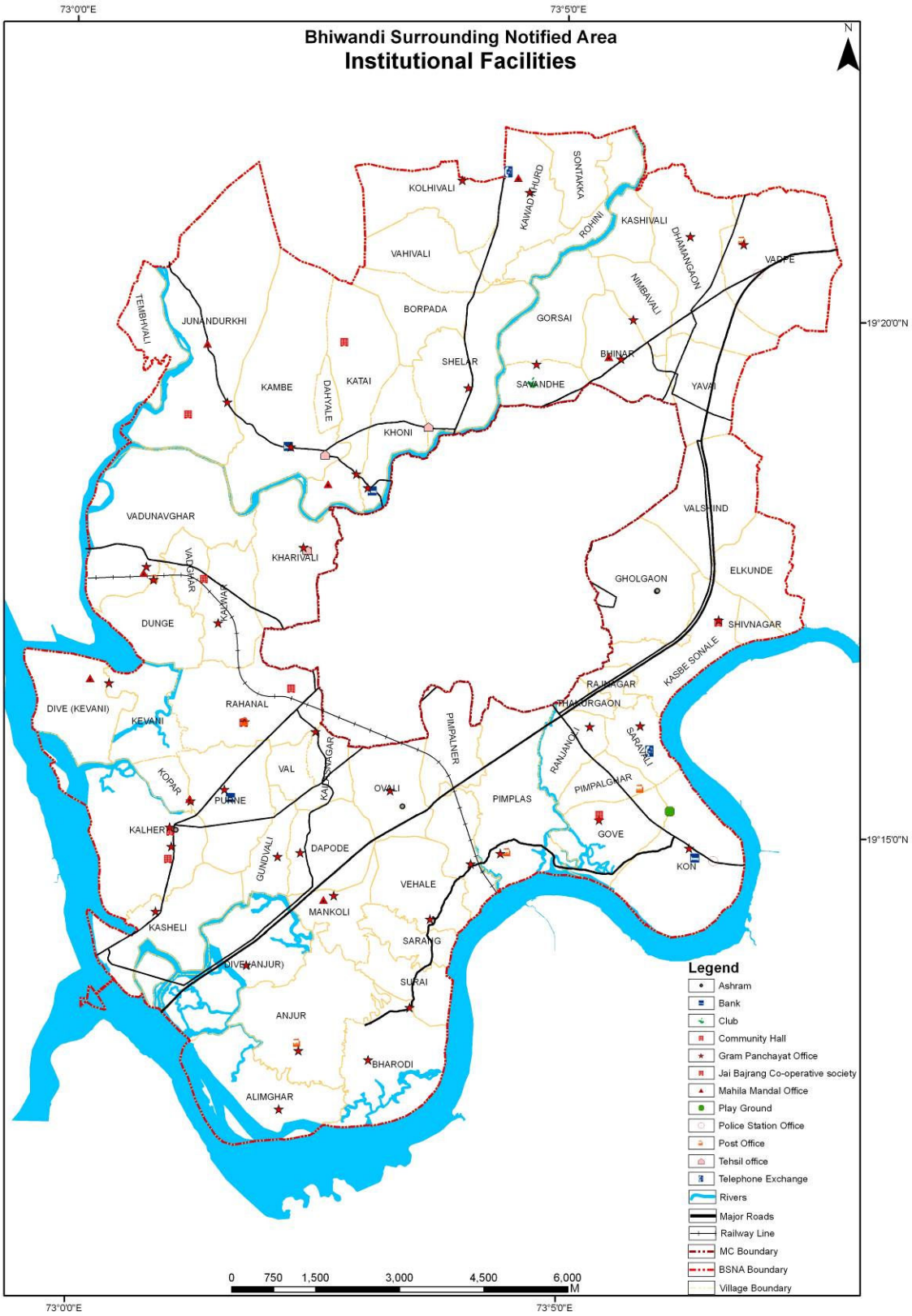
It may be concluded from the analysis of medical facilities that:

- There is no specialized hospital in Bhiwandi and BSNA for which people go to Thane or Mumbai.
- The only hospital in BSNA cannot provide for the health needs of 1.6 lacks population of BSNA.
- The existing medical facilities lack in supporting infrastructure.
- The distribution of the health facilities is uneven.

7.4 Post Office and Telegraph

Post office and telegraph are the major component of communication development. The total number of post offices in the BSNA is 9. The existing spatial distribution of post office is shown in Figure 7.3.

Figure 7.3: BSNA: Location of Post Office etc. Facilities



7.5 Open Spaces

Open spaces/play grounds are lungs of any area and cater to the active and passive recreational needs of the citizens. The Varhala Lake is the biggest recreational area in the city. The BNMC has developed parks along the lake. The city has only a few parks and organized open spaces (Table 7.6). The hierarchical distribution of organized open spaces for equitable accessibility is essential.

Table 7.6 Existing Open Spaces in Bhiwandi-Nizampur

Sr. No.	Facilities	Number	Area(hectare)
1	Public Gardens	22	8.52
2	Open Spaces / Playground	4	6.57
3	Gymnasium	13	0.08
	Total	39	15.17

Source: Bhiwandi Nizampur Municipal Corporation

Table 7.7 Planning Norms & Standards for Socio-Cultural Facilities

Sr. No.	Categories	Population/unit
1	Multipurpose Community Hall	10,000
2	Recreational Club	1.0 lakh
3	Socio-Cultural activities: Auditorium, Music, Dance and drama	1.0 lakh
4	Old Age Home	5 lakh

Source: Delhi Master Plan Document-2021

The facilities mentioned in Table 7.7 are lacking in BSNA. The norms need to be incorporated while planning for the area.

7.6 Banks

Total number of banks in the BNMC is 18. The villages have both commercial and co-operative banks. Dahyale, Purne and Khoni villages have commercial banks. Khoni and Dapode villages have co-operative banks. The villages in the BSNA also include agricultural credit societies show in figure 7.3.

Table 7.8 Existing Bank Facilities in villages

Sr. No.	Commercial Bank	Co-operative Banks
1.	3	3

Source: District Census Handbook

A commercial bank exists only in village Kambe. These facilities are not integrated with the road network in the area. The villages, which are equipped with these facilities, should have

strong linkages with other villages. Figure7.3 reveals that the three co-operative banks are located in the southwestern side of BSNA. The commercial banks are located in Kambe and Khoni which are Census towns.

7.7 Summary

It is observed from the preceding discussion on social infrastructure that BSNA lacks in educational, medical, communication and credit facilities. All the villages in BSNA do not have primary schools where school children go to the adjacent villages. The secondary schools are also not distributed evenly. The students of the region have to go to Thane and other major urban settlements for getting higher-level education particularly professional education. There is only one Polytechnic in village Khoni. There seems a need to introduce some more technical and professional institutes in large villages like Kon, Shelar and Alimghar etc. as per population standard.

In case of health facilities, there is only one hospital in village Purne that doesn't cater to the health needs of the area. The public health services are equally distributed but dispensaries are not equally distributed as they are only concentrated in the northeast and southwest side of the area. These should be planned and located in such a manner that whole of the region may be served.

Banks and post offices are also not properly distributed in the region. There is no proper link or access to the banks from some of the villages. Open spaces are there in the BNMC itself but there is no planned open space or park in the rest of the BSNA. Socio-cultural activities are missing in the region and need to be planned.

CHAPTER-VIII

ECONOMY

8.1 Introduction

The economy of any region is largely governed by four interdependent factors which include money, labour, land and entrepreneurs. All these factors are taken into account for initiating any development activity. The activity thus initiated, generates employment and production and provides a boost to the economy.

8.2 Employment Pattern

In Bhiwandi the ratio of workers and non-workers decreased from 1:1.47 in 1981 to 1:1.43 in 1991 to 1:1.39 in 2001, mainly engaged in the secondary and tertiary sectors with an overwhelming proportion of 96.9% and 98.3% in 1981 and 2001 respectively (Table 8.1). It may be attributed to power loom and warehousing concentration in BNMC. In Bhiwandi, the power looms grew from 16,500 units in 1960 to 4, 50,000units by 2001.

The economic status of BSNA has been examined on the basis of secondary data. The total workers have been divided into main and marginal workers. The main workers are further classified into cultivators, agricultural labors, household workers and other workers.

Table 8.1: BNMC Decadal Growth in Main Workers and their Classifications

Year	Total Workers	Total Main Workers	Cultivators		Agricultural Laborers		Household Industry Workers		Other Workers	
			Number	%age	Number	%age	Number	%age	Number	%age
1981	46719	45235	101	0.2	20	0.04	1247	2.8	43867	96.9
1991	155788	154411	1018	0.7	539	0.30	1104	0.7	151750	98.3
2001	250227	243066	533	0.2	417	0.17	3618	1.5	238498	98.1

Source: Primary Census Abstract-Thane, 1981, 1991, 2001

Table 8.1 reveals that the number of total workers increased from 46719 in 1981 to 250227 in 2001, which is about six-fold increase.

Other workers category includes Transport and Communication, Trade & commerce, Mining & Quarrying, Construction, Administration & Offices and other services.

8.2.1 Bhiwandi Surrounding Notified Area

The economic status of BSNA has been studied at two levels i.e. individual village level and at total BSNA level. The overall change in the occupational structure of the area during the last three census years i.e. 1981 1991, 2001 for which the secondary data were available has been analyzed. Tables 8.2, 8.3 and 8.4 show percentile changes in the proportion of cultivators and agricultural labourers and in other workers category from 1981 to 2001 respectively.

Table 8.2: BSNA-Registering Percentile increase of Cultivators (1981-2001) BSNA

Village Name	Change in Percentage (1981-2001)		Percentage Increase (%)
	1981 (%)	2001 (%)	
Anjur	21	54	157
Kawadkhurd	29	32	10
Shivnagar	64	73	14
Dhamangaon	25	27	8
Bharodi	16	32	100
Kashivali	48	81	69

Source: Primary Census Abstract, 1981, 1991, 2001-Thane

Table 8.2 shows that Anjur, Kawad Khurd, Shivnagar, Dhamangoan, Bharodi and Kashivali villages have registered an increase in cultivators during 1981 to 2001. Anjur village (157%) followed by Bharodi (100%) have witnessed the maximum increase.

Table 8.3: BSNA- Registering Percentile Increase in Agricultural Labourers (1981-2001)

Village Name	Change in Percentage (1981-2001)		Percentage Increase (%)
	1981 (%)	2001 (%)	
Pimpalas	7	10	43
Anjur	7	9	34
Gove	1	3	200
Vehele	7	12	71
Dhamangaon	16	23	44
Vaghivali	12	19	58
Surai	4	16	300
Vadpe	20	37	85
Bharodi	1	3	200
Nimbavali	7	10	43
Sontakka	24	41	71

Source: Primary Census Abstract, 1981, 1991, 2001-Thane

Table 8.3 reveals that 11 villages have witnessed increase in agricultural labour. Surai village experienced the highest increase (300%) followed by Gove (200%) and Bharodi (200%). Bharodi village has shown considerable increase in both cultivators and agriculture labor.

Table 8.4: BSNA – Registering a Decline in Proportion of Other Workers (1981-2001)

Village Name	Change in Percentage (1981-2001)		Percentage Decrease (%)
	1981 (%)	2001 (%)	
Anjur	67	36	-46
Shivnagar	26	24	-8
Dhamangaon	58	48	-17
Bharodi	83	64	-23
Sontakka	21	14	-33
Kashivali	40	19	-53

Source: Primary Census Abstract, 1981, 1991, 2001-Thane

Table 8.4 shows out those six villages namely Anjur, Shivnagar, Dhamangaon, Bharodi, Sontakka and Kashivali have witnessed a decrease in Other Workers during 1981-2001. Anjur village (-46%) and Kashivali (-53) have witnessed maximum decrease.

Table 8.5: BSNA - Decadal Change in Main Workers and Their Classification

Year	Total Workers	Total Main Workers	Cultivators		Agricultural Laborers		Household Industry Workers		Other Workers	
			Number	%age	Number	%age	Number	%age	Number	%age
1981	32777	28673	9650	33.7	3140	11.0	666	2.3	15217	53.0
1991	52821	43674	10920	25.0	4090	9.4	475	1.1	28189	64.5
2001	74476	61517	6535	10.6	2141	3.5	696	1.1	52145	84.8

Source: Primary Census Abstract-Thane, 1981, 1991, 2001

Table 8.5 shows the trend of change in total main working force from 1981 to 2001. The proportion of main cultivators has decreased from one third in 1981 to one tenth by 2001. The proportion of agricultural laborers also witnessed a decrease from 11% to 3 % during the same period. The household industry workers also decreased from 2.3 % in 1981 to 1% by 2001.The study reveals that the proportion of Other Workers experienced considerable increase from 53% in 1981 to 84.8% in 2001. It indicates that the economy of BSNA is shifting from primary sector to secondary and tertiary sector. Table 8.6 shows that the proportion of marginal workers in the area has increased from 12.5% in 1981 to 17.4% in 2001.

Table 8.6: BSNA – Decadal Growth in Marginal Workers

Year	Total Workers	Total Marginal Worker	Percentage
1981	32777	4104	12.5
1991	52821	9147	17.3
2001	74476	12959	17.4

Source: Primary Census Abstract-Thane, 1981, 1991, 2001

This change is mainly because of boom in the Handloom and Power loom industry and Godowns/warehouses since 1981. Since 1981, the Bhiwandi and its surroundings is the only single storage space for the Mumbai. Due to these factors, there is a shift in the primary sector to secondary and tertiary sectors in BSNA

8.3 Household Income

Household income provides an important indicator for assessing economic conditions of the people. For examining the monthly household income in BSNA, the percentage distribution of Bhiwandi City households, at different income levels, given in the Comprehensive Study for Traffic and Transportation has been used as the base (Table 8.7).

Table 8.7: BSNA- Income Distribution per Household per Month

Sr. No.	Income Distribution (In Rs.)	Total Households	Percent to Households
1	0-1500	4314	3
2.	1501-3000	7189	5
3.	3000-5000	46006	32
4.	5000-10000	38818	27
5.	10000-20000	37380	26
6.	20000-30000	8621	6
7.	30000-40000	1439	1
	Total	143767	100

Source: Comprehensive Transportation Study for MMR

8.4 Trade and Commerce

Textiles and warehousing are the two important trade and commerce activities of Bhiwandi and BSNA. This is the main source of economy. About 40% of textile exports of India are from Bhiwandi and its surrounding area*. (Development Plan for Bhiwandi-Nizampur).*

It is observed that some of the hand/power looms have become sick units. The growing number of sick units has started affecting the economy adversely acting as a centrifugal force for the migrants.

Table 8.8: BSNA- Three Most Important Export Commodities

Towns	Important Commodities Exported from BSNA		
	1st.	2nd.	3rd.
Bhiwandi (M.CORP.)	Power loom	Rice Mill Machinery	Agricultural Equipments
Karivali (CT)	Black Stone	Cloth	-
Katai (CT)	Cloth		-
Khoni (CT)	Cloth		-
Kon (CT)	Salt	Sugar	-
Shelar (CT)	Rice	Grass	Wood

Source: District Census Abstract, 2001, Thane

Table 8.8 reveals three important commodities exported from Bhiwandi city, Karivali, Katai, Kon and Shelar towns of BSNA. The exported items include Cloths, Rice Mill Machinery, Agricultural Equipments, Blackstone, Cloths, Salt, Sugar, Grass and Wood (Table 8.9).

Table 8.9: BSNA - Three Most Important Manufactured Commodities

Towns	1st	2nd	3rd
Bhiwandi (M.CORP.)	Rice Mill Machinery	Bullock Carts	Cultured Pearls
Karivali (CT)	Ready-made Garments	-	-
Katai (CT)	Cloths	-	-
Khoni (CT)	Cloths	-	-
Kon (CT)	Cloths	Bricks	-
Shelar (CT)	Wooden Furniture	-	-

Source: District Census Abstract, 2001, Thane

The most important commodities imported in the BSNA are yarn and wood. The yarn is used in the textile industry, handlooms and powerlooms. Wood based units are located in Shelar town. Wood imported in the BSNA is used for the wooden furniture purposes.

8.5 Industry

8.5.1 Industrial Growth in BNMC

Bhiwandi is part of M.M.R (Zone IV) where the new industrial units and expansion of existing units, irrespective of their scale, was allowed according to the Industrial Location Policy for B.M.R. (1972). Almost 78% of city's workforce is employed in secondary sector (Table 8.10,11 &12).

Table 8.10: BNMC- Existing Industrial Units in Various Categories

Sr. No.	Category	Number of Industrial units	Percentage
1	Manufacturing	4,629	41.86
2	Processing	19	0.18
3	Engineering	61	0.55
4	Others	6,348	57.41
	Total no. of units	11,057	100.00

Source-Bhiwandi Nizampur City Municipal Corporation

There were 553 registered industrial units in BNMC in 2001. Out of these 196 units are polluting and 357 are non-polluting industries. Most of these industrial units are located in the city.

Table8.11 Growth of Power looms in Bhiwandi-Nizampur

Year	N0. of Power looms in Bhiwandi	Compounded Annual Growth Rate
1960	16,500	-
1972	36,000	8.11%
1982	120,000	12.79%
1991	250,000	7.62%
2001	4,50,000	6.05%

Source - Draft Development Plan (Revised)

Table 8.12 Category-wise Industrial Units in Bhiwandi (2006)

Sr. No.	Type of Industry	Number of Units
1	Chemical	16
2	Engineering	151
3	Electrical	50
4	Electronics	8
5	Software Development	1
6	Printing	6,121
7	Textile Weaving	17
8	Textile Processing	3,491
9	Textile Dyeing	1,170
	Total	11,025

Source: Bhiwandi Nizampur city Municipal Corporation

Table 8.13: BSNA- Distribution of Godowns/Warehouses (year)

Sr. No.	Village Name	Number of Godowns	Percentage
1	Kalher	1540	33.0
2	Dapode	470	10.0
3	Kopar	460	9.8
4	Purne	878	18.8
5	Rahanal	490	10.5
6	Val	595	12.8
7	Kasheli	55	1.2
8	Gundavali	100	2.1
9	Mankoli	25	0.5
10	Sonale	37	0.8
11	Ovali	10	0.02
	Total	4660	100

Source: Tehsil Office, Bhiwandi

From the Table 8.13 it is evident that there are 4660 of godowns/warehouses in 11 villages of BSNA. All these godowns/warehouses are concentrated in the southwest part of the BSNA. The maximum numbers of godowns are in Kalher which constitute about one third of total godowns followed by Purne (18.8%), Val (12.8%) and Rahanal (10.5%). About one-fifth (18.8%) of godowns/warehouses are in Purne village.

Table 8.14: BSNA- Employment Status of Villages having Godowns

Village	Area (in ha)	Population	Total Workers	% of Workers	Household Workers	Other Workers	Non-Workers
Kalher	522	7485	2755	36.81	72	2460	4730
Kopar	68	1004	346	34.46	5	332	658
Kasheli	360	2345	749	33.86	9	659	1596
Sonale	293	999	361	36.14	0	192	638
Ovali	202	1215	526	43.29	4	428	689
Val	66	1095	589	53.79	0	330	506
Rahanal	362	6906	3094	44.80	49	2883	3812
Purne	273	2772	2484	89.61	45	2288	288
Gundavali	102	1784	812	45.52	6	518	972
Dapode	209	1677	657	39.18	50	465	1020
Mankoli	127	2310	876	37.92	8	691	1434
Total	2584	29592	13249	44.77	248	11246	16343

Source: Primary Census Abstract-Thane, 2001

Table 8.14 depicts the employment status of villages having godowns. It is evident that the work participation varies from the lowest 33.86% in Kasheli to highest (89.61%) in Purne.

Surprisingly, Kalher village with maximum concentration (about one-third) of total godowns/warehouses has a low (36.81%) participation rate.

8.6 Agriculture and Allied Activities

Agriculture is the dominant economic activity in BSNA. The total area under agricultural use is 85.94 sq km. Rice is a major crop grown in Alimghar, Mankoli, Vehele, Sarang, Surai, Dive Anjur, Bharodi, Ranjnoli and Pimpalas. Vegetables are also grown in some villages. It has been observed that dependence on agriculture sector is decreasing in BSNA.

Some villages have blackish soil with sand which is suitable for paddy cultivation. In the Khari area where water quality is saline, crop like paddy, cotton, guar, sorghum, sugar beet etc (salt tolerant varieties) can be cultivated. The water except in creek affected areas is suitable for paddy, pulse, beans, grams and fodder crops. Vegetables like chilly, tomato, brindle, and cabbage of hybrid variety can also be grown in the area. The area has good potential for floriculture, which has high economic value.

8.6.1 Livestock

Table 8.15 Livestock of BSNA

Sr. No.	Livestock	Livestock in Thane District	Livestock in BSNA	Percent to Total
1	Cow	493706	905	2.00
2	Ox	126869	2918	6.80
3	Buffalo	223548	5324	12.40
4	Goat	33956	781	1.80
5	Hen	144239	33175	77.00
	Total	1022318	43103	100.00

Source: Block Development Office, Bhiwandi

Table 8.15 shows that hens constitute about three-forth of total livestock available in BSNA followed by Buffalo (12.4%). Cow, Ox and goats together constitute about one-tenth of total livestock.

8.7 Summary

It is observed from the preceding discussion that the economy of BSNA in transition o change from primary sector to secondary and tertiary sector. There are also indications of growing number of sick loom industrial at units and initiation of back migration of workforce.

It is also observed that cotton textile industry and warehousing have made the trade and commerce of BSNA vibrant.

CHAPTER – IX

TRAFFIC AND TRANSPORTATION

9.1 Introduction

Transportation is a great mobility factor in shaping growth patterns and the land use pattern of a city. Transportation is also one of the key factors in influencing the quality of life. Transport infrastructure, which effectively meets the needs of the business and industry and improves mobility of the population to their work places, is also a critical input of enhancing economic growth and productivity.

9.2 Proposals of MMR

For efficient transport network the proposals in the Regional Plan for Mumbai Metropolitan Area (1996-2015) concerning BSNA (Figure 9.1) are the following:

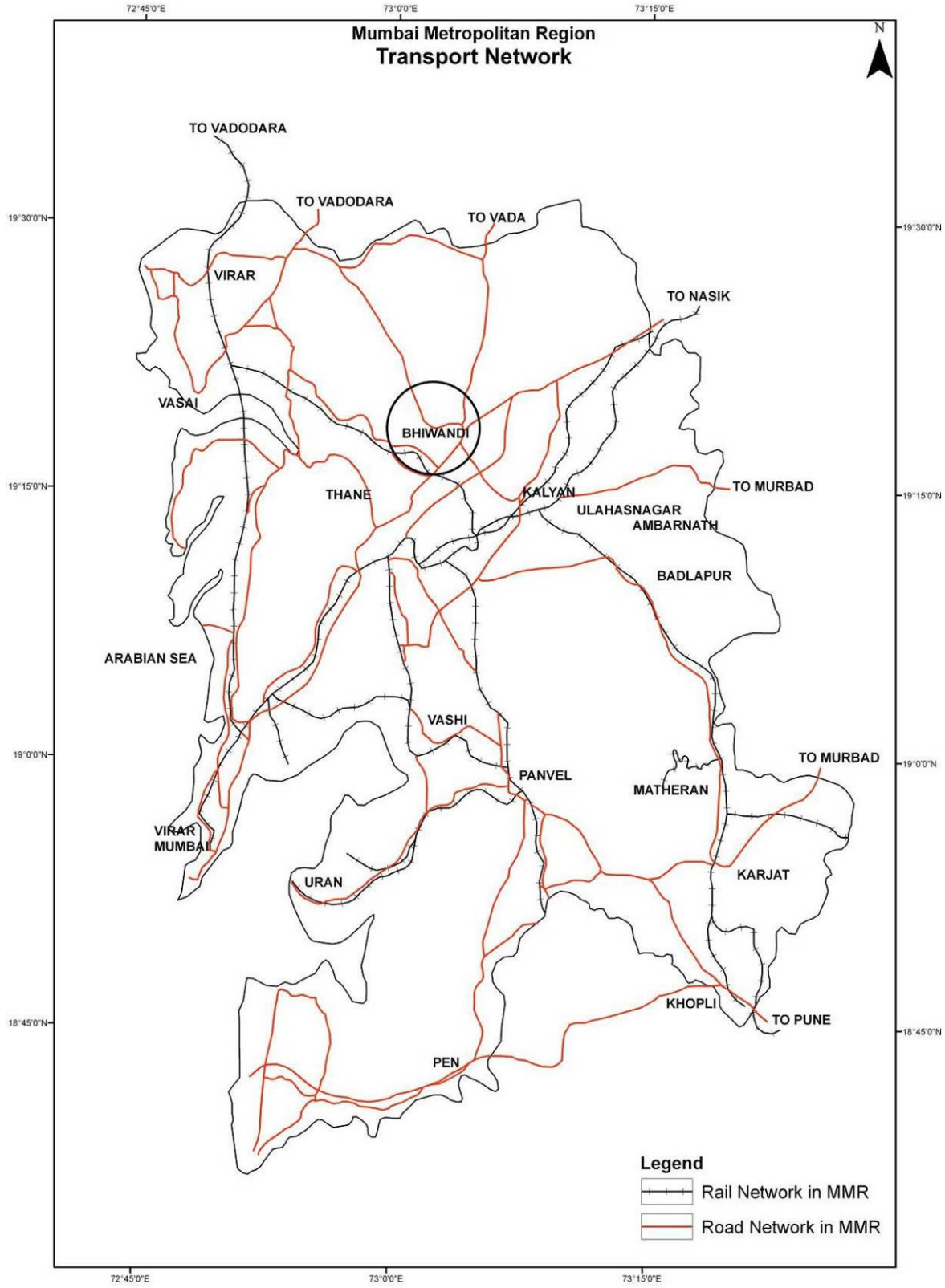
I. Improvements in the connection from Vasai-Virar to Bhiwandi

II. Improvement of the Thane-Bhiwandi road possibly as a BOT project-NH-3

III. Proposed road improvements from Bhiwandi to Kalyan

The regional connectivity in terms of road network makes Bhiwandi a potential nodal centre for future development. On the other hand, BSNA has some physical constraints for multiple connectivity because of Ulhas River, the existing hills and ridges. Figure 9.1 depicts the Existing Transport Network in MMR.

Figure 9.1 Existing Transport Network in MMR



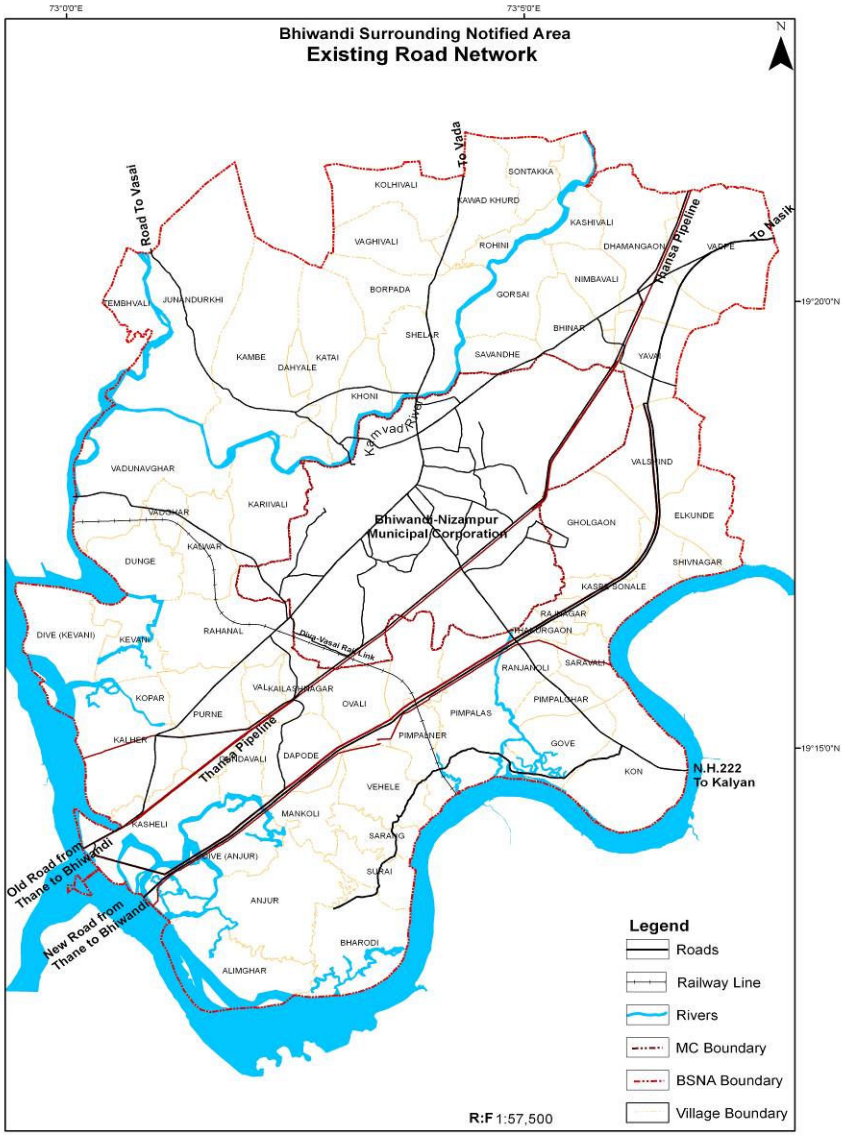
9.3 Rail Link of Bhiwandi in MMR

Bhiwandi has no direct railway link with Mumbai. BSNA has emerged as the hub of warehouses and supply centre in MMR the inadequacy of railways and link via Vasai and Kalyan is one of the major causes of traffic congestion. In regional context, the rail connectivity of Bhiwandi and BSNA is under active consideration of MMRDA.

9.4 Existing Road Network

Bhiwandi-Nizampur is connected to Greater Mumbai and the rest of region through NH-3, which is popularly known as the Agra or Nasik Road. It passes through the BSNA in southwest –northeast direction. Another highway connects Bhiwandi and BSNA with Kalyan and other parts of the MMR. Other important roads are Bhiwandi-Vada State Highway, Bhiwandi Vasai State Highway and other major district roads (Figure 9.2).

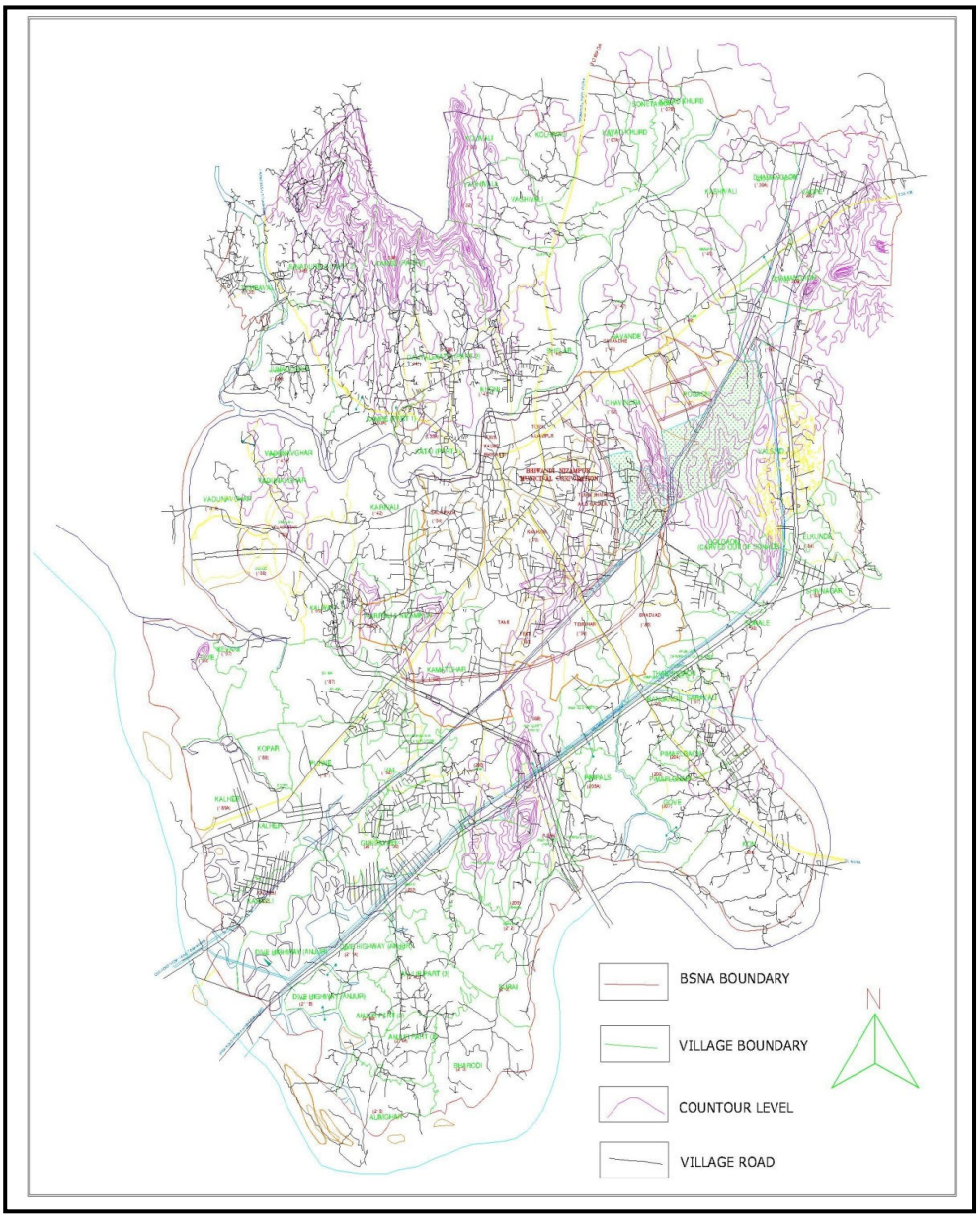
Figure 9.2: BSNA- Existing Road Network (index)



9.5 Road Network in BSNA

In rural areas, pucca roads connect some villages whereas other villages have kutcha roads. Internal road network of villages Ranjnoli, Saravali, Valshind, Vadpe, and Savandhe is not satisfactory. During interaction with villagers, it was observed that large volume of water flows on the roads during the rainy season causing damage to the roads. During the monsoon season, the villages are cut off from the rest of the surroundings (Figure 9.3). The villages which have poor road network largely fall below 10m height above mean sea level.

Figure 9.3 Existing Rural Networks in BSNA



9.6 Water Supply Pipelines –The connectivity Barriers

The water supply pipelines passing through BSNA are barriers in providing multiple routes for efficient surface connectivity. These pipelines run parallel to the NH-3 on both sides. Along the National Highway -3, the water pipelines run parallel to the road defining the linear movement along the road but limited access to the surrounding area. The positive impact of these pipelines is protection of road frontage from multiple openings on the main arteries.

9.7 Public Transport

BSNA is connected with Kalyan, Thane, Mumbai and Vada by bus services operated by Maharashtra State Transport Corporation. In addition, the buses from Thane Municipal Corporation, Kalyan Dombivali Municipal Corporation also operate from Thane and Kalyan Dombivali region to Bhiwandi. According to the *Environmental Status Report (2004-05)*, it is estimated that at present more than 100 trips are taken between Bhiwandi and Thane and more than 150 trips between Bhiwandi and Kalyan, providing low cost transportation to more than 30,000 passengers every day.

9.7.2 Auto Rickshaws

The auto rickshaws cater to a major part of the local traffic. Apart from operating within BSNA these auto rickshaws run between Bhiwandi and Kalyan facilitate passengers residing in Bhiwandi and use Kalyan station for commuting.

9.8 Parking Facilities

A general survey has indicated that parts of BSNA that have concentration of Warehouses need parking spaces. It has been found that existing roads, which are narrow and already overcrowded, are being used for parking of vehicles and the effective width of the roads is further reduced. At present, no specific parking lots are available other than mobility spaces within the warehouse premises. The existing land use of BSNA reveals that the area is the hub of godowns and power loom industry. These are traffic-generating activities leading to the movement of goods from one area to another involving multi-axle vehicle as well.

9.9 Application of Gravity Model

Gravity Model has been applied for Bhiwandi and its surroundings for assessing the level of interaction. The model is related with the movement pattern among the settlements. The applicability of the model gives the coefficient of gravity among various settlements. The model uses two types of data.

1) The absolute figure of the population of the chosen settlements and

2) The distance between the chosen settlements.

3) The Model uses the following formula

Gm =P1X P2/ (D) 2

Here, Gm is the value of interaction between the two settlements, P1 and P2 is the population of chosen settlements and D is the distance between the settlements. Table 9.1 shows the major settlements considered for the application of Gravity Model.

***Table* 9.1 Name of Settlements Chosen for Gravity Model**

Sr. No.	Name of Settlement	Population (projected in 2011by MMRDA)	Distance(KM) Between Bhiwandi and Chosen Settlements
1	Bhiwandi Sub Region	1019334	0
2	KMC Sub region	1766503	10
3	TMC Sub Region	1435000	16
4	Ulhas Nagar	613400	18
5	Vasai	207867	30
6	Panvel	238437	41

Source; Mumbai Metropolitan Region Plan Document, 1996-2015

The level of interaction between Bhiwandi and Kalyan

(1) Gm = P1X P2/ (D) 2 =1019334X1766503/ (10) 2 = 18006565690

The level of interaction between Bhiwandi and Thane

(2) Gm = P1X P2/ (D) 2 =1019334X1435000/ (16) 2 = 5713844882

The level of interaction between Bhiwandi and Ulhas Nagar

(3) Gm = P1X P2/ (D) 2 =1019334X613400/ (18) 2 =929813196

The level of interaction between Bhiwandi and Vasai

(4) Gm = P1X P2/ (D) 2 =1019334X207867/ (30) 2 = 2354287 78

The level of interaction between Bhiwandi and Panvel

(5) Gm = P1X P2/ (D) 2 =1019334X238437/ (41) 2 = 144584735

According to the numerical values of gravity model computed above the highest interaction level is found between Bhiwandi and Kalyan in terms of passengers and goods followed by Bhiwandi and Thane, Bhiwandi and Ulhas Nagar, Bhiwandi and Vasai and Bhiwandi and Panvel.

Application of the gravity model suggests that the existing road network between Bhiwandi and Kalyan should have the highest priority for planning. The second order priority of transportation link should be between Thane city (District Headquarter) and Bhiwandi city.

9.10 Proposals of Lee Associates

The Comprehensive Transportation Study conducted by Lee Associates has given some proposals for Bhiwandi Sub region shown in table 9.2.

Table 9.2 Proposal of Lee Associates

Sr. No.	Proposals	Improvement/New links	Length in Km
1	Suburban Rail Proposal between Thane and Bhiwandi	New link	12.5
2	Inner ring road (Bhiwandi road-Panvel):EBL Corridor	Higher order highway corridor	34.0
3	Middle Ring road (Bhiwandi-Nandivali-Naren Goan)	Higher order highway corridor	18.0
4	Radial -3 Bhiwandi Bypass	Higher order highway corridor	14.0
5	Radial -3 Bhiwandi Bypass:EBL Corridors	Higher order highway corridor	9.0
6	Bhiwandi Metro-Kalyan Metro-Khard- Lee Associates	Proposed Metro Transit Network	20.78
7	Panvel-Taloja-Nilje-Temghar(Bhiwandi)	Proposed higher order road Transport Network	37.61
8	Temghar(Bhiwandi)-Vashind(Kasane)	Proposed higher order road Transport Network	27.54

Sources: Comprehensive Traffic and Transportation for MMR

Broadly these pertain to:

1. Proposals for the Terminals Facilities
2. Bus Stand between Bhiwandi-Vasai (North-West)
3. Terminal Infrastructure facility for Bhiwandi Nizampur Bus Stand - Provide 8 additional bus bays
4. Inter- city Bus Terminals-Bhiwandi-Nizampur M.C. Area. The area proposed for the terminal is 3 Ha

The above proposals will be incorporated in the development plan for the BSNA.

9.11 Findings of Traffic and Transportation Study

9.11.1 The Problems and Potential of Transport network

There is a ring and radial pattern of road network. There is no direct rail connectivity of the area with Mumbai. There is absence of integration of existing land use (largely warehousing)

with the road network. The connectivity among the villages is very poor require new links apart strengthening the existing network.

There is lack of traffic management system. There are no parking facilities for the goods moving vehicles and no truck terminal or transportation hub in BSNA. There is lack of an efficient public transportation system with the surrounding area. Public transport, except for a few villages, in most parts of BSNA is almost negligible. The villagers approach the city by personal vehicles or three-wheelers. Auto rickshaws are the dominant mode of transportation in absence of public transportation.

9.12 Summary

Traffic and transportation study reveals that the BSNA has good connectivity with the surrounding settlements namely Thane, Kalyan and Vada which are connected through National Highways and State Highway, respectively. The multi-axle vehicles carry excessive load on the existing roads. The truck movement on these roads is more because of the existing godowns, warehouses and power loom units. The existing roads are not capable of catering to the increasing load of heavy vehicles. Thus, the problems of congestion, heavy traffic jams, noise pollution, and time wastage particularly on Old Agra road are in vogue.

There is no parking facility for heavy vehicles or goods moving vehicles in BSNA which further adds to the traffic problems. There is a strong need to have a separate freight movement corridor in the region to cater to the demand of the goods traffic.

The sub-urban railway facility to the region is missing. People of BSNA go to Kalyan city for commuting by railway. The Bhiwandi Road Railway Station in the city is only for goods and freight transportation. People of the region suffer due to lack of direct railway link to Mumbai and Thane. There is a lack of efficient public transportation system in the region. The connectivity among the villages is very poor and as a result, majority of the villages in the region do not have the facility of the public transportation, and movement to other areas is through personal vehicles.

However, all the problems referred above are under active consideration of the government for efficient movement of men and material within BSNA and its connectivity with the surroundings.

CHAPTER - X

UTILITIES AND SERVICES

10.1 Introduction

For quality living sustainable basic amenities including water, sewerage, drainage, solid waste management and power are requires. The growth of population, if not coped up with, puts tremendous pressure on these services. This section deals with the assessment of basic urban services. Since Bhiwandi is part of the sub-region, the position of Bhiwandi has to be understood to understand BSNA.

10.2 Water Supply in Bhiwandi- Nizampur

Bhiwandi-Nizampur City Municipal Corporation Area comes under Zone III (10.4.1, page 243 Regional Plan for Mumbai Metropolitan Region 1991-2011) of Mumbai Metropolitan Region, which is divided into six zones for planning water resources and hydrometric study. The limited water resources and the high population growth mainly resulting from heavy migration due to the employment opportunities offered by the city have widened the present demand-supply gap.

10.3 Sources of Water supply to Bhiwandi-Nizampur

The source of safe, potable drinking water for Bhiwandi Nizampur areas can be categorized as:

I. Piped Distribution System
II. Natural Sources & Open Wells
III. Bore Wells & Hand Pumps

Of the above, piped water is the most important source of potable water in Bhiwandi city. The piped water supply is available to 90% of the population, whereas, about 10% population, especially in the fringe areas is dependent on natural wells and bore wells. Presently, the city water requirement is approximately 125 MLD, which is estimated to increase to 175 MLD by the year 2011 and 295 MLD by year 2026.

10.3.1 Piped Water Supply

The city receives a total supply of 112 MLD from various sources out of which about 35 MLD comes from Tansa and Vaitarna mains of the Mumbai Municipal Corporation, 3 MLD from Varhala Lake and the remaining 74 MLD from Shahad Temghar Water Works(Table 10.1). Thus, the total water supply comes to approximately 120 liters per capita per day (considering unavoidable physical losses to be 20%).

Table 10.1 Sources of Water Supply for Bhiwandi – Nizampur

Sr. No.	Agency	MLD
1	BMC Tapping (Varhala)	15.0
2	BMC Tapping (ST Stand)	10.0
3	From BMC Tapping	10.0

4	From STEM	10.0
5	STEM – 1	37.0
6	STEM - 2	12.0
7	Additional from STEM (2005)	15.0
8	Varhala water works	3.0
9.	Total water supply	112.0

Source: Environmental Status Report Bhiwandi - Nizampur area (2004-05)

The average water supply duration in the city is 12 hrs. The diameters of the pipelines vary from 80 mm to 600 mm. The city has 14 storage reservoirs of various capacities for storage and distribution of water as shown in Table 10.2.

Table 10.2 List and Capacities of Reservoirs

Sr. No.	Name of Reservoir	Capacity in MLD
1	S. T. ESR	1.125
2	ST ESR	1.125
3	IGM ESR	2
4	IGM ESR	2
5	Mamata ESR	2.5
6	Kamatghar ESR	0.3
7	Bhadvad ESR	0.3
8	Navi Wasti ESR, Temghar	0.5
9	Nagaon ESR	0.5
10	Shantinagar ESR	1.5
11	Varhala ESR	1
12	Varhala GSR	0.9
13	Narpoli GSR	2
14	Chavindra	0.08
	Total Storage Capacity	15.83

Table 10.3 Annual Water Charges

Sr. No.	Type	Water Supply Charges(Rs.)	
		½" pipelines	1"pipelines
1	Residential	906	9,600
2	Non Residential	4200	42,000

The table 10.3 shows that the corporation provides water at a subsidized rate to most of the domestic users. The consumers are charged on a flat yearly basis depending on the diameter of the connection.

10.3.2 Other Sources of Water

There are about 350 open wells in the city, public as well as private and more than 1,517 bore wells, fitted with jet pumps and submersible pumps for providing water to the areas not catered to by the piped water supply. In addition, the BNMC also operates 9 tankers for providing water to various localities, especially during summer season.

10.4 Water Quality

Presence of coli forms in certain localities and absence or shortage of residual chlorine was found in Municipal tap water in some of the localities, which indicates that the quality of water is much below the desired limits. The water sample analysis carried out by the District Medical Officer's laboratory reveals the suitability of water for drinking purposes. *The quality of ground water is desirable except in some villages of BSNA located near the creeks.*

10.5 Demand Supply Gap

The recent demand-supply gap analysis for the city shows that there is a gap of more than 16 MLD, as compared to the existing demand for water, which is estimated to be 128 MLD. This gap is set to increase over years. The position of supply and demand gap for the BNMC is shown in Fig 10.1.

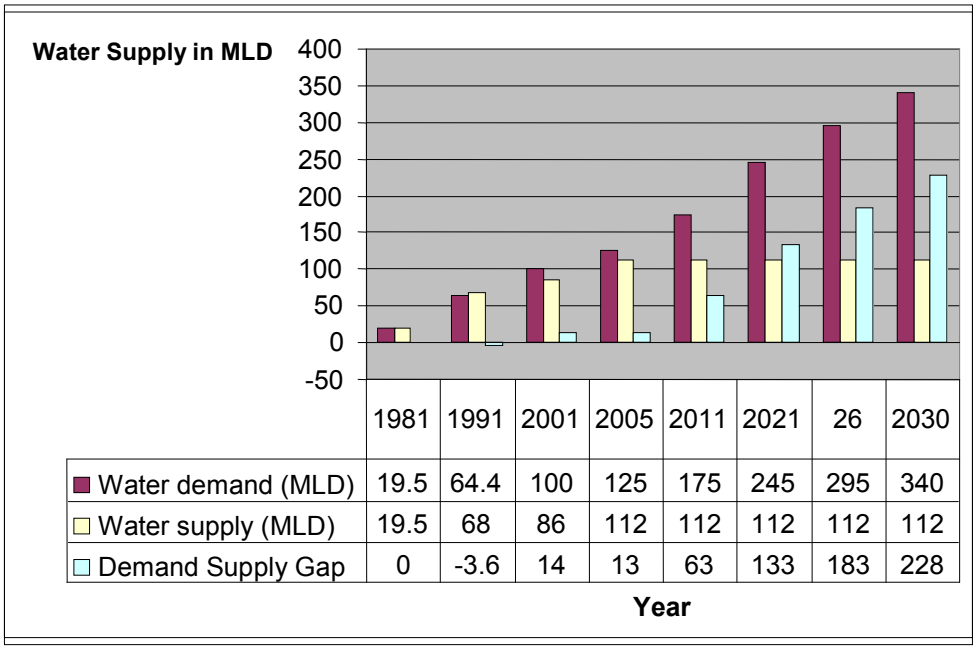


Figure 10.1 Water Supply and Demand Gap for BNMC

In 1981 the in demand and supply of water were equal there was no shortage of water. In 2001, water demand exceeded the water supply in the city. Based on the current trends, it is estimated that there would be a gap of 228 MLD of water by 2030.

10.5.1 Other Water Resources

There are 350 open wells, public as well as private and more than 1,517 bore-wells, fitted with jet-pumps and submersible-pumps for providing water to the areas not catered to by the piped water supply.

10.6 Sewerage

The city presently generates approximately 100 MLD of sewage (assuming that 80% of the water supply goes into the sewage). Like most of the old towns in the country, Bhiwandi also

had dry toilet system. In keeping with the governmental policies (Bhangi Mukti Yojana), these were gradually phased out and an underground sewerage system was conceived in 1962-63 to cater to the then existing population of 50,000 and a design population of 1, 00,000.The present sewerage system consists of closed drains – mostly in the central parts of the city, open drains (Nallahs) and sewers, Sewage Pumping Stations and Sewage Treatment Plant.

Initially under Phase-I, no treatment plant was designed to treat effluent generated within the town. Only natural ponds (oxidation ponds) were designed for sedimentation process of solid particles present in the initial effluent collected and, after completion of sedimentation process, final effluent was to be used by the nearby villagers for agricultural purposes. After completion of the scheme, villagers had resisted the storing of initial effluent in oxidation ponds for treatment. It was decided to the discharge whole effluent into the creek.

In 1979-80, the Government prepared a sewerage scheme to cover remaining parts of Bhiwandi town and treating the effluent collected by the old scheme with financial assistance from the World Bank. This was called as the M.W.S.S.B. Stage I. The scheme consisted of trunks main, laterals, property connections & house connections to collect the effluent generated throughout the town and carry it to the pumping stations. Under this scheme, two pumping stations and one sewage treatment plant (17.5 M.L.D. capacities) were designed. The actual work started in 1983-84 and was completed in 1997. This scheme was operated and maintained by the M.W.S.S.B. until 2002. Later, it was transferred to Municipal Corporation for operating and maintaining. This scheme covered only one-fourth of the Municipal area. It is now decided to cover the entire area of the city under the underground sewerage system.

10.7 Solid Waste

In cities, which house a large population and where a large number of economic and commercial activities are concentrated, generation of solid waste is most natural and obvious expression of prosperity. In scarcely populated areas, such as those in rural hinterlands, the management of solid waste is left to nature. There have been occurrences of epidemics in the past, notably the most recent was in Surat in Gujarat, due to non-existence of an effective and efficient solid waste management system. Solid waste Management is thus one of the primary duties of the Urban Local Bodies. The Municipal Solid Waste Rules (2000) make it mandatory for the Municipal Corporation or Council to set up effective collection, treatment and disposal infrastructure for managing the solid waste.

10.7.1 Solid Waste Generation

The major sources of solid waste in Bhiwandi Nizampur Municipal Corporation are

I. Garbage from Households,
II. Construction Debris,
III. Waste Generated from Commercial Activities,
IV. Vegetable Waste,
V. Industrial Waste from effluent treatment plants.

10.7.2 Composition of Solid Waste

The Municipal solid waste is composed of domestic waste such as kitchen waste, paper, packaging material, rubber or plastics, commercial waste such as vegetable waste from markets and industrial waste like cloth, plastics along with some hazardous or toxic material. Another category of solid waste is the medical waste but these are dealt with separately with a dedicated system of collection, transportation and disposal.

For Bhiwandi Nizampur Municipal Area the general composition of solid waste generated shows that the 60% of the waste generated is organic – vegetable or food based. Unusable cloth and textile pieces form the other major chunk with a 22% share. This is typical to Bhiwandi Nizampur owing to its numerous power loom units. *The Khoni, Katai, Kon and Shelar, Dapode, Ovali part are also the problematic villages in the BSNA so far as the matter of generation of waste is concerned. The growing problem of solid waste management needs to be incorporated in the development plan.*

10.7.3 Quantity of Solid Waste Generated

As per the Draft Development Plan Report of Bhiwandi Nizampur, the solid waste generation rate is estimated to be 0.3 kg /capita /day. Accordingly, solid waste generation was worked out at 114 tons per day in 1991. It was estimated then that there was a backlog of 10 tons per day in terms of collection and disposal. According to the Environmental Status Report (2004-2005) solid waste generation was estimated at a little over 300 tons per day. It was also stated that the solid waste generation in the city has been increasing at a rate of 10 to 15% each year, of which less than 50% was collected and disposed.

The average per capita generation of solid waste for Class-I cities works out to be 0.376 kg/person/day. The per capita generation of solid waste ranges from 0.1 kg/day for Junagadh to 0.929 kg/day for Jalgaon city in Maharashtra. However, it is seen that in most of the major metropolitan cities waste generation rates ranges from 0.45 in Greater Mumbai, 0.57 in Delhi and 0.62 in Chennai. On an average, considering the urban growth and higher densities, the solid waste generation rate can be assumed at 0.5 kg per capita per day. The population of Bhiwandi Nizampur is estimated at 7.5 lakh in 2005. Thus, the present solid waste generation is estimated at 375 metric tons per day.

10.8 Efforts of MMRDA in Solid Waste Management

MMRDA created a Solid Waste Management (SWM) Special Project Cell in December 2007 to address the issue of developing the landfill sites in MMR as mandated by Municipal Solid Waste (M&H) Rules, 2000 and also to develop a comprehensive strategy towards solid waste management for the entire Metropolitan Region. The SWM Special Project Cell has completed pre-feasibility survey work of the 15 sites which were identified jointly by MMRDA, MCGM & the State Government in the 2004. Out of these five sites meet the requirements of the guidelines and parameters given in MSW (M&H) Rules (2000). Further work of identification of ownership of lands and detailed survey work is in progress. These sites then will be developed by MMRDA as scientifically engineered regional landfill sites. These regional landfill

sites are proposed to be developed in the first phase for 25 years from 2009 year 2034 and in the second phase from the year 2035 to 2060 taking into account the increasing population vis-à-vis increasing generation of garbage in the next 50 years.

Apart from developing Regional Landfill Sites, MMRDA is also gearing–up for establishing appropriate regulatory, financial and institutional mechanism to operate these sites during this period. No doubt, the concept of developing Common Landfill Sites for the entire Metropolitan Region on such a large scale is unique in nature and has the potential of being a role model which can be emulated in other parts of the country.

Since, the development of Municipal Solid Waste disposal site MSW) is supplementary and complimentary to the development of Regional Landfill Sites, MMRDA has also undertaken a study of existing MSW disposal sites of 13 Urban Local Bodies in MMR and is also in the process of preparing a comprehensive strategy to improve these sites and create appropriate infrastructure facilities enhancing their operational utility. Under these efforts, Bhiwandi Municipal Corporation will get the opportunity of improving the existing disposal site.

Construction & Demolition Waste (C & D Waste) Strategy:

The proper disposal of construction and demolition waste generated by the project works undertaken by MMRDA is a new challenge. The Project Cell endeavors to assess the quantum of such waste for a projected period of 15 years. The strategy is to handle C&D Waste of the works undertaken by MMRDA as per guide lines provided under MSW (M&H) Rules (2000) & also recover and reuse the C&D Waste as per market demands. All these projects will definitely have a tremendous overall impact on the environment and will accelerate the developmental growth of MMR region.

10.9 Summary

It is observed that there is a wide gap between the water demand and supply in the BNMC requiring augmentation. The water is supplied through four different sources i.e. 35 MLD from Pipe Lines, 3 MLD from Varhala Lake and the remaining 74 MLD from Shahad Temghar Water Works, however, with the growing population of the region, these existing water supply sources are not capable to cater to the demand. During early 1980s, there was no difference in demand and supply of water. In 2001, water demand exceeded the water supply in the city. In the year 2030, it is assumed that there would be a gap of 228 MLD of water.

The sewerage network covers only one-fourth of the BMC area. In rest of the area sewage is directly disposed off into Kamvadi and Ulhas rivers. For disposal of solid waste generated in the BNMC, no proper dumping sites are provided in the area. The open areas, banks of Kamvadi river and drains are being used for dumping solid waste. The BSNA, excluding BNMC, suffers from inadequacy of water supply and sewerage facilities.

CHAPTER - XI

ENVIRONMENTAL STATUS

11.1 Environmental Status in BNMC

11.1.1 Air Pollution

Clean air is a health necessity. Maintaining or improving its quality is essential to ensure for present and future generations. The air quality in the area has been monitored at various locations (Environment Status Report 2005) corresponding to different situations, like proximity to national and state highways, proximity to industrial areas and wind direction (Table 11.1).

Table 11.1 Classification of Air Quality as per the CPCB Guidelines

Sr. No.	Pollution Level	Industrial		Residential	
		SO2 & NOx	SPM	SO2 & NOx	SPM
1	Low	0-40	0-180	0-30	0-70
2	Moderate	40-80	180-360	30-60	70-140
3	High	80-120	360-540	60-90	140-210
4	Critical	>120	>540	>90	>210

Source: Environment Status Report 2005

The suspended particles are directly emitted into the air, from variety of sources such as cars, trucks, buses, factories, construction sites, tilled field, unpaved roads, stone crushing and burning of wood. Other particles come from chemical change of gases. They are indirectly formed when gas-burning fuels react with sunlight and combustion in motor vehicles, power plants and other industrial processes.

Effects of Particulates

The particulate matter is associated with causing serious health effects and other associated environmental problems such as, atmospheric haze reducing visibility, changing nutrient and chemical balance, erosion and staining of structures including culturally important objects such as monuments and statues. Health problems of sensitive people increase if they are exposed to high levels of particulate matter in the air. The health problems associated to particulate matter include:

1. Asthma aggravation and increase in respiratory problems;
2. Bronchitis;
3. Decreased lung function;
4. Premature Death;
5. Oxides of Nitrogen;

Nitrogen Oxides

Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NOx are motor vehicles, electric utilities, other industrial, commercial and residential sources that burn fuels. The most important contributors of NO2 are motor vehicles and industry. Oxides of Nitrogen, or Nixies is the term for oxides of nitrogen present in the air, Nitrogen oxides, or NOx is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. The main types of NOx are nitrogen oxide (N2O), nitric oxide (NO) and Nitrogen dioxide.

Sulphur Dioxide

Sulfur dioxide comes mainly from burning fossil fuels and smelting processes. Especially coal is high in sulphur. Sulphur Dioxide (SO2) is a gas formed from burning of sulphur. Sulphur dioxide can have harmful effects on health, depending upon the exposure time and concentration. Particularly asthmatic is a susceptible group to exposure to sulfur dioxide. The average sulphur dioxide concentration in Bhiwandi ranges from 11 microgram per cubic meter to 22 microgram per cubic meter. The highest sulphur dioxide concentration was found at the Wanjarpatti Naka in Bhiwandi city.

Hydrocarbons & Carbon Monoxide Concentration in Bhiwandi

The HC concentration ranges from 0.18 microgram per cubic meter to 0.56 microgram per cubic meter. The highest HC concentration was found in the area of Kalyan Naka. The trend of HC concentration is reflected in the CO concentration. The Kalyan Phata area has highest CO concentration of 5.56. The CO concentration ranges from 1.68 microgram per cubic meter to 5.56 microgram per cubic meter in the area.

11.1.2 Noise Pollution

Noise pollution originates from traffic junctions, industrial and commercial areas. Pollution Control Cell has taken ½ hourly noise readings for 24 hours at three residential, commercial and industrial areas. The average decibel values at residential, commercial and industrial are given in Table 11.2. The noise level at residential and commercial areas is more than the limits prescribed by MPCB due to the operation of power looms.

Table 11.2: Bhiwandi-Noise levels at Certain Locations in db

Sr. No.	Location	Type of Area	Noise Level in dB		
			2001-02	2003-04	2004-05
1	Near Power looms, Uchitpada	Industrial	50	48	65
2	Naryan Compound Power loom	Industrial	48	50	67
3	Koka Compound	Industrial	46	40	62
4	Bhandari Compound	Industrial	52	46	56
5	Vegetable Market	Commercial	45	56	43
6	Dargah Road	Commercial	40	38	49

7	Teen Batti Naka	Commercial	38	46	55
8	Kalyan Naka	Commercial	50	50	62
9	Quarter Gate	Commercial	48	56	50
10	Shanti Nagar	Residential	40	38	46
11	Sangampada	Residential	38	38	31
12	Temghar	Residential	38	46	35
13	IGM Hospital	Silence	40	36	44
14	Count Area	Silence	36	30	38
15	BNN college	Silence	37	42	38

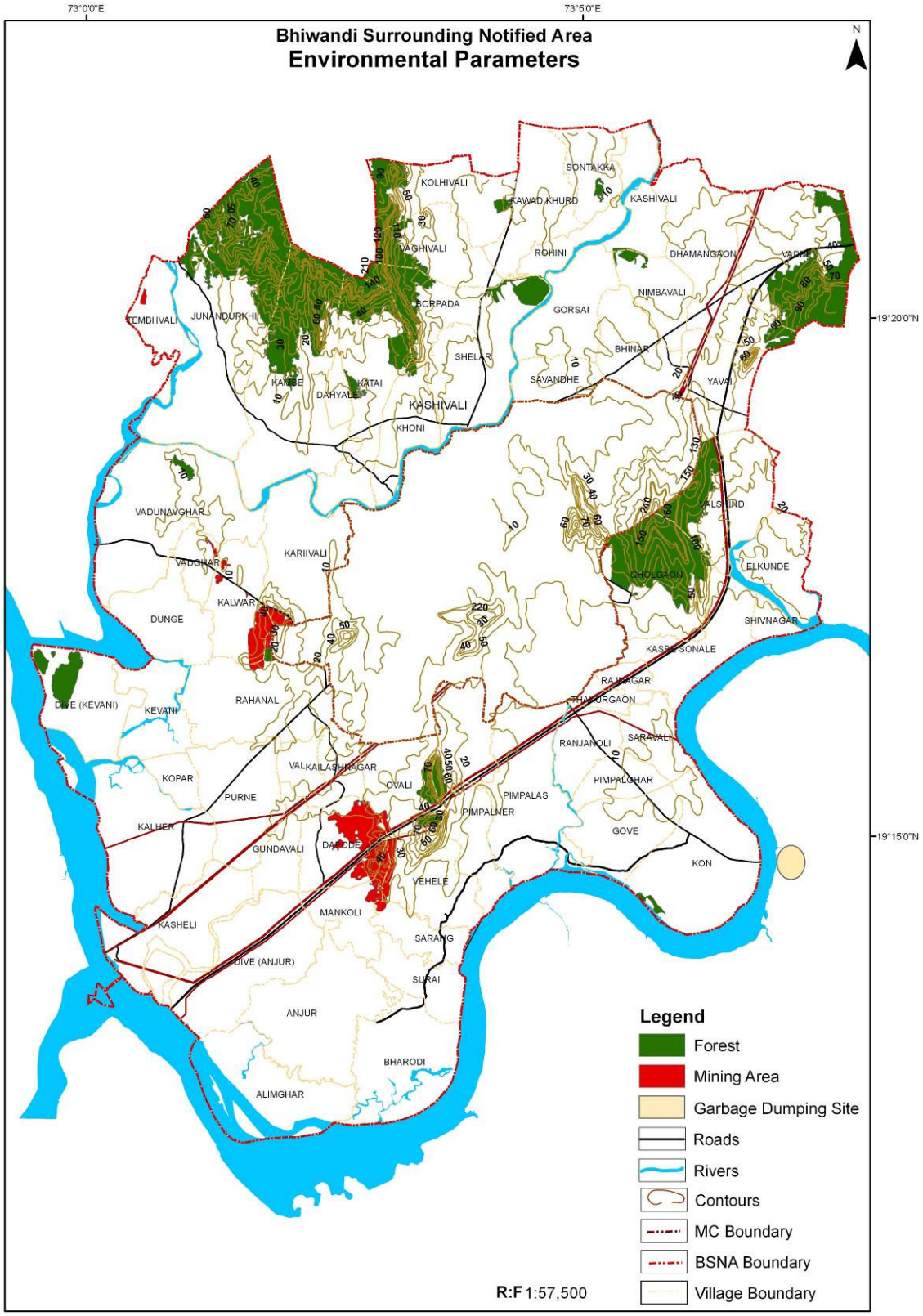
11.1.3 Lakes and Water Bodies

The city planners in late sixties and early seventies decided to convert a small pond near ancient temple of Varala Devi in the erstwhile villages of Bhiwandi into a water storage reservoir by constructing an earthen dam which was completed in early eighties creating the second fresh water lake in Mumbai Metropolitan Area. It is still being used for water supply purposes. The studies of water quality and bathymetry indicate an advanced level of pollution and eutrophication of lake and it is obvious that unless immediate steps are taken for the conservation of the lake, the condition would deteriorate further. This will ultimately affect the economic potential of the lake and its surroundings. Concerned by the continuous deterioration in water quality with and the damage sustained by dedicate and fragile lake eco-system, the BNMC proposes to undertake a project for remediation of this lake.

11.2 Environmental Status in BNSA

BSNA spreads over 151.2 Sq km area. It is surrounded by Ulhas River in southern side, which identifies its boundary. In northern side, there are hills, ridge and a large forest cover which provides a very good environment.

Figure 11.1 Environmental Parameters



From Figure 11.1 it is clear that there are a lot of water bodies in BSNA. On southern side of BSNA, Ulhas river flows, this is polluted due to sewerage disposal of Bhiwandi and Kalyan. On the left bank of Ulhas river in Kalyan there is a huge garbage disposal site. There are a few mining areas in BSNA which degrading the environment status of BSNA as mining is done by blasting which has affected. Brick kilns are also responsible for ecological degradation in BSNA.

11.2.2 Recycling of Waste Water

The possibilities of augmenting water supply through development of groundwater are discussed in this report based on the secondary data from groundwater survey and development agency and central groundwater board (in term of systematic and reappraised of hydro geological survey on required level and exploration for augmenting irrigation resources. Groundwater development for use in urban areas has been examined to meet the growing demand in the project area.

11.2.3 Hydrology Ion concentration (pH)

The area has pH of 7.4 to 7.5. The variation of pH in whole of the project area is within the permissible limit for both surface water supply and bore hole water supply.

11.2.4 Total Hardness

The total hardness in the area is between 32 to 476 mg/l. The least hardness (32-58 mg/l) is seen from the sample of dam water supply, whereas the hardness ranges from 170 to 476 mg/l for the water samples from existing boreholes with a depth upto 60m. The total dissolved solids are within the desirable limits.

11.2.5 Chloride concentration

The concentration of chloride is least (08 to 66 mg/l) in the project area. Chloride concentration increases in bore wells from Bhiwandi towards the eastern side. These values are well within the permissible limits.

11.2.5 Fluorides

The concentration of fluoride is least in borehole at Kundm 0.2 mg/l and is maximum at Pardha 0.55 mg/l. These values are well within permissible limits. The water sample from the Dam source reveals that it is free from fluoride contents.

11.2.6 Nitrate

All samples collected from the dam and bore wells reveal that nitrate concentration varied from 0.13 to 11.12 mg/l. These values are well within the permissible limits.

11.2.7 Iron

All samples collected from surface and sub-surface levels reveals that iron concentration varies from .02 to .08 mg/l. These values are within the permissible limits. The organic and microbiological aspects of water samples analyzed by District Medical Officer of Zila Parishad,

Bhiwandi reveal that water is suitable for domestic use. The electrical conductivity and Sodium Absorption Ratio indicates that the groundwater is suitable for horticulture and gardening purposes.

Groundwater Survey and Development Agency has recently analyzed groundwater samples from dug well along Ulhas River which were subjected to trace elements analysis at Geological Survey of India's laboratory at Nagpur. Table 11.3 reveals the results of the analysis.

Table 11.3 Summarized Analytical Results of the Trace Elements

Constituents	Ranges
Cu (ppm)	Less than 0.25
Pb (ppm)	Less than 1.00
Zn (ppm)	Less than 0.5 to 0.06
Nz (ppm)	Less than 0.50
Co (ppm)	Less than 0.50
Cd (ppm)	Less than 0.05
Mn (ppm)	Less than 0.25 to 3.60
Ac (ppm)	Less than 1.00
Hg (ppm)	Less than 20

The analysis reveals that the nitrogen content is more than 20ppm (81% of samples) in the areas where minimum sanitary facilities exist and people defecate in open areas. The total dissolved salts are within permissible limits of drinking water standards.

11.3 Environmental Considerations of MMRDA

The study on Environmental Management Strategy and Action Plan for MMR (EMS Study) has emphasized the need for strategic environmental planning as a tool for environmental management of MMR, and has identified MMRDA as the agency to perform this task. The EMS study has defined environmental planning as a systematic approach achieving simultaneous consideration of environmental matters with land use issues within the overall context of planning. The EMS Study has suggested a procedure for arriving at a land use plan after considering environmental concerns of particular land uses, evaluating alternative locations and establishing where different activities could be located subject to environmental guidelines and standards.

The land use plan forming part of the Revised Regional Plan is not prepared following this procedure. However, some of the specific land use proposals such as, new growth centers can be subjected to such procedure before they are taken up for development. In this context, as observed in the EMS Study, it is important to recognize that the environmental measures need to be adopted as a regular and consistent activity at each stage of the development i.e. preparation of plans, assessment of development applications, design of the project or scheme,

construction and operation, rather than one-off exercise to achieve environmentally sound development.

11.3.1 Policies and Proposals

Apart from the adoption of environmental planning procedure and EIA as recommended by EMS Study, there are other specific policies and proposals that deserve attention in the Revised Regional Plan. They are as follows:

As a general policy, wetlands should be preserved in their pristine state and should not be reclaimed by filling or bunding. They should be used only in accordance with the MEF notification of 19th February, 1991 as amended from time to time. In exceptional circumstances, they may be used for setting up waste treatment and disposal facilities, slum up-gradation, rehabilitation and new housing for urban poor, and brackish water fish farming. Similarly, wetlands may also be used for critical infrastructure works such as, pipelines, approach roads, bridges, etc. Reclamation of wetlands may also be allowed for beautification and protection of waterfront. In all such cases, however, compulsion to use wetlands should be clearly established and environmental assessment conducted.

Since the greatest aesthetical and environmental damage to the regional landscape is caused by indiscriminate quarrying activities, they should be permitted only in specific areas and quarrying operations should be planned and conducted systematically in accordance with environmental guidelines.

In order to reconcile the pressure of development activities on the existing G- Zone lands with the environmental objective of preserving the fragile eco-system, the EMS study has suggested reorganizing the existing G- Zone into following Sub-Zones.

Sub-Zone (i) Lands having future urban development potential particularly in the proximity of urban centers with transport facility. Sub-Zone (ii) predominantly agricultural lands where permitted activities are allied to agriculture and limited non-agricultural developments such as, gaothans and their expansions, large institutions, recreational activities, etc. Sub-Zone (iii) Fragile eco-systems and areas of high environmental sensitivity such as, wetlands, mangroves, coastal areas, and steep slopes, reserved and protected forests and Sub-Zone (iv); Lands where future development should be restricted or totally prohibited i.e. lands within 300 m. on either side of rivers, areas prone to frequent flooding, areas liable to inversion phenomenon and areas in close proximity of drinking water sources. In view of the zoning system proposed for the Revised Land Use Plan, the foregoing recommendations can be accepted with the following slight modification:

11.4 Summary

BSNA includes hills, ridges and forests in the northern and eastern part and water bodies like rivers and creeks in the southern and western part. From the nature's point of view, the environment of the region is very calm and healthy but with the development of obnoxious and non-obnoxious industries, godowns and warehouses mining and quarrying the environment of the area is getting degraded. On one side, the area under forests (100 hectares), agriculture (8400 hectares) and water bodies provide healthy environment, the handloom and power loom

units create noise pollution, textile and dyeing industries pollute the ground water quality and air quality, the sewer disposal in Ulhas and Kamvadi rivers pollutes the water.

In villages Khoni, Katai and Kharipar area, due to the large concentration of power looms, handloom units coupled with slum type housing, garbage dumping site and disposal of sewer into the Kamvadi river are degrading environmental quality of BSNA.

The mining in the region has also affected the environment with blasting and moreover the land left after mining process is of no use for any development activity except recreation. The surface geology of the area gets affected with a number of brick kilns in BSNA.

The land along the Ulhas and Kamvadi rivers and along the creeks becomes swampy and marshy due to the backlash and cannot be used for any development activity. These marshy areas could be retained under the environment sensitive areas.

The BSNA offers considerable potential for recreational development particularly in the northeastern part. Some villages (Junandurkhi, Kambe and Gorsai) in the northwestern part also have a good environment and potential to develop as recreational centers.

CHAPTER - XII

PUBLIC PARTICIPATION

12.1 Introduction

Participation of local people, developers and other stakeholders is essential component of development plan preparation. The basic purpose for public participation is to incorporate the ideas and views of the people being well conversant with the local conditions and to reflect their aspirations in the Plan. Therefore, successful implementation of the development plan requires public participation. Public meetings with different groups were organized listed as below:

I. Block Development Officer and officers reporting to him,
II. Sarpanch / Panch/Representatives of the villages.
III. Project Officers of Integrated Tribal Development Plan
IV. Transport Stakeholders.

The survey team had requested Block Development Officer, Bhiwandi to seek the views of the concerned public of Bhiwandi regarding the preparation of Development Plan of BSNA (1911-1931) in order to understand their problems and aspirations that could be reflected in the development plan of BSNA (Figure 12.1). Accordingly, a public consultation meeting was convened by the Study Team at BDPO Office, Bhiwandi. In total, 32 representatives of village Panchayats participated this meeting. A questionnaire was circulated to solicit their views.

The data collected through the questionnaires filled by the respective Sarpanch/representatives of the villages reveals that residents need wide metalled roads for better connectivity with surrounding areas. They also need promotion of employment generating activities in the area. As per their views, storm water drainage is the big problem in many of the villages. They asked for a permanent solution of storm water drainage. The problem of traffic and bottlenecks were also pointed out. They also pointed out the problem of drinking water facilities in their respective villages. Some of the villages require railway facilities in the area.

Figure 12.1 Meeting with Sarpanchs/Representative of Villages at BDO Office, Bhiwandi

12.1.2 Meeting with Transport Stakeholders

For improving transportation, a meeting with transporters was organized for ascertaining their views for evolving effective transportation network. The following suggestions given:

I. Link roads need periodic joint inspection with the officials;
II. Octroi being time consuming should be abolished;
III. In absence truck parking arrangements trucks are parked on the roadside causing traffic bottlenecks;
IV. Pune-Thane road suffers from traffic congestions therefore elevated road should be proposed in the Master Plan.
V. The existing container size is preferable in the existing road conditions. The larger size of container should not be implemented due to the connection of existing road networks.

12.1.3 Major Observations *of the meeting with Project Officer, ITDP*

The tribal society being mainly agrarian requires water supply for agriculture and floriculture in view of small land holdings they need irrigation water for intensive use of land. Buffalo are yielding milk 6-8 liters of milk per day which is quite low. This is due to the shortage of fodder. Subsidized fodder may help in milk yield. The current rate of wages is on the lower side, which may be increased.

CHAPTER - XIII

SWOT ANALYSIS

Based on published and unpublished reports, land use pattern, field investigations and public discussions the Strengths, Weaknesses, Opportunities and Threats (SWOT) analyses of BSNA have been summarized as follows:

13.1 Strengths

I. Nearness to Megalopolis Mumbai enhances BSNA investment potentials on account of comparatively cheaper land.

II. BSNA has the capacity of accommodating the spillover effect of Mumbai, kalian, Bhiwandi and other areas,

III. Since is cheaper Large numbers of warehousing/storage units have emerged,

IV. Owing to Nearness to Mumbai higher level infrastructure facilitates are available to the people of BSNA,

V. Nearness to domestic and international Airports,

VI. Fast growing population of Mumbai serves as a huge market for all types of manufactured goods produced at Bhiwandi and BSNA. This gives a boom to power loom industry, pharmaceuticals and other industries and manufacturing units.

VII. For exports air and water terminals of Mumbai are available,

VIII. BSNA has good regional linkages through NH-3, Bhiwandi-Kalyan highway, state highways and major district roads,

IX. BSNA has a unique topography presenting hills, ridges and forests at different places. The hills with forest cover in Kambe, Junandurkhi and Katai villages in the north, in the eastern parts of BSNA along NH-3 offer tremendous recreational potential of regional scale.

13.2 Weaknesses

I. Lack of Spatial Planning- despite MMR Plan it was only in 2007 when MMRDA was notified as the special planning agency, BSNA was the backyard of Mumbai. No concrete efforts were made to develop it as a planned regional Center.

II. In absence of planned development, BSNA suffers from quality housing and quality educational institutions the essential attractions of prospective investments. It is also one of the reasons of bad work and-living area relationship.

III. Non existence of multi-lateral connectivity with Thane and Kalyan BSNA clubbed with the upsurge of Ulhas and Kamvadi rivers BSNA could not be the choice of activities there than the warehouses and the power/handlooms.

IV. Its topography representing creeks, rivers, hills, forests, low-lying areas, and pipelines constrains development. Large areas along rivers and creeks are either marshy or get flooded during rainfall season. About 80% of BSNA is below 10 m above the mean sea level.

V. Some potential pockets between old and new Thane-Nasik Highway in BSNA rapidly developed as warehousing and godowns concentrations but the commensurate transportation infrastructure such as new routes, widening of the existing roads, flyovers, underpasses, parking areas have not taken place. The areas already developed offer least opportunity of removing the deficiency for the reasons that development in this area is haphazard, unplanned and unorganized. This occurrence has resulted into unhygienic sanitary system, poor drainage, inadequate parking for loading and unloading of vehicles, inadequate road widths, poor road geometries, degraded environment etc.

VI. The condition and infrastructure related to schools, hospitals are not in a good condition and the existing schooling, health, communication and credit infrastructure is not as per the standards.

VII. Diva- Vasai rail link is only used for freight movement as passenger movement is yet to start on this track and people have to use road transport to reach Mumbai, Thane, Kalyan, etc. which is expensive as compared to rail transport.

VIII. Public transport in most of the BSNA is absent only auto rickshaws ply.

13.3 Opportunities

I. Most of the BSNA being a green-field project offers tremendous opportunities for housing sector. Since land, comparatively, is chapter BSNA provides large scope for the affordable and rental housing projects.

II. Land being cheaper, there is a large scope for setting up of general industrial parks and the theme parks including SEZs.

III. Since it has good regional linkages BSNA offers tremendous scope for the regional level infrastructure such as Logistics Hubs, Tourism/Recreational resorts, Universities, Research Institutions, health and educational institutions etc.

IV. BSNA being close to the domestic and international airports it offers opportunities to those domestic and multinational companies to establish offices in absence space at cheaper rates in Mumbai.

V. DFC/ DMIC passing through the BSNA further enhances the investment levels in the SPA.

13.4 Threats

I. The existence of wet lands/mangrove, creeks, rivers, forest cover etc. have a serious threat of unscrupulous exploitation of land resource hence threatening the ecological balance. The physical character of the area, specifically the mountains and forests bordering north-western, northern and north-eastern parts which is a beautiful and picturesque landscape area the river fronts require skillful handling.

II. Increasing Pollutants from industry, traffic and domestic disposal are threats to the environment and quality of life that need a check and efforts to restore the environment status in its natural form.

III. In absence of efficient transportation system and proportionate development of parks/open spaces, water supply and sewerage in the city, the infrastructural backlog including housing provisions is increasing leaps and bound.

IV. The land values in the area are an indication that the BSNA is passing into the hands of private players, developers who grab the land for personal benefits. To develop green, calm and quite environment through public interventions as residential, industrial, commercial/administrative complexes is the need of the area. In the light of MMR, proposals and guidelines, urbanization is eminent and the area is going to be under urban activities and land uses. If proper site/location based zoning regulations are not enforced for a well thought of comprehensive development plan, there are chances that the whole area may develop as a thought less urban sprawl, instead of developing on 4 pillars of planning i.e. efficiency, economy, sustainability and habitability. Ultimately, the area may develop as an urban chaos resulting into repulsing the economic activity to some other areas.

CHAPTER – XIV

Main Planning Considerations: Determinants of Proposals

Regulating future urban growth and to wipe out infrastructural backlog while keeping pace with the growing infrastructure demand, development concept of metropolitan region was introduced. Experiences in Metropolitan Regional Planning are the lessons of future planning for attaining harmonious development of Metropolitan Regions and Metropolitan Interlocking Regions. Broadly, there are two types of such regions hinging around the national capital city and the commercial capital (Hub) city. The first one is at the national level while the other is at the local or the state level or as the case may be. At the national level, reported so far of its kind, is the National Capital Region of National Capital Territory, Delhi and at the local level Mumbai Metropolitan Region are the best Indian examples. In the world the best known are the Tokyo, Colombo and the London Metropolitan regions at the national level and Shanghai and the New York at the local level. The term 'local' applied here is purely from the point of view of legal entity otherwise these are metropolitans of global economic network. The study reveals that the urban phenomenon worldwide is similar. The variation is only in the gravity of the urban infrastructure problems and urban management.

Preparing Draft Development Plan for Bhiwandi Surrounding Notified Area (BSNA) will be an incomplete exercise if Bhiwandi city is not understood for its bearing on the development and growth potentials of BSNA particularly with reference to planning practices in the past.

14. 1 Bhiwandi- Nizampur Municipal Corporation

Known as "Bhimbari" during Mughal period, Bhiwandi is one of the nine Municipal Corporations in the MMR. It came under the controls of Britishers in 1817. Till 1817, Bhimbari (Bhiwandi) was the headquarter of 463 villages. From 1817, till 1860, a sizeable military under the command of European officers was stationed at Bhiwandi. The military camp lay on a comparatively higher ground in the east of the town, which locally was known as the 'camp' and now it is known as 'Khan' and the open ground is occupied by the '*zopadpattis*'. The old military dispensary at present is housing the subordinate judge's court. The Bhiwandi Municipal council was established on 10th October, 1864. The Municipal limits of Bhiwandi-Nizampur were extended in August 1918 and later in 1982, thereby extending

the Municipal area to 2635.94 hectares i.e., 26.36 sq.km. In the year 2001, Bhiwandi-Nizampur Municipal Corporation was constituted.

14.1.1 Past Planning Efforts

For attaining planned growth of Bhiwandi, comprehensive efforts made were only in 1960s. Tremendous pressure put was on the existing land, roads and other services of the town by the increasing inflow of immigrants from 1911 onwards. The increasing number of power loom units incapacitated the roads to sustain the traffic. First time, in 1960, Bhiwandi-Nizampur Municipal Council realized the need of having Development Plan of the town. The first Development Plan for the Municipal area submitted to the Government for sanction was in the year 1963. The Government Sanctioned the Development Plan that came into force from 1.st December 1964.

The Municipal Council undertook the First revision of the sanctioned Development Plan in 1971. Municipal Council published the Draft Development Plan prepared by the Town Planning Department in 1973. Observing all legal formalities stipulated in M.R &T.P. Act, 1966, Municipal Council submitted the revised Draft Development Plan to the Government for approval in 1974 under the provisions of Section 30(1) of M.R. & T.P. Act. Government accorded the sanction to the revised Development Plan on 21.5.1976 that came into force with effect from 25.06.1976.

Municipal Council declared its intentions on 21.8.1963, to undertake the preparation of Draft Town Planning Scheme No.1. The Draft Town Planning Scheme prepared by Town Planning Department submitted to the Government was in 1965.The Government accorded the sanction to the draft Town Planning Scheme in 1965. An Arbitrator for finalizing the scheme was appointed. The Arbitrator submitted the Final Scheme to the Government that accorded the sanction to the Final Town Planning Scheme on 8th July, 1986, and the same came into force with effect from 1.9.1986 i.e. after 20 years of the intent.

14.1.2 Development Plan for Bhiwandi- Nizampur Corporation Area

The Bhiwandi - Nizampur Municipal area and the surrounding villages comprise part of Bombay Metropolitan Region. The development in the surrounding villages of Bhiwandi was controlled and restricted according to the proposals of the sanctioned Regional Plan. According to the earlier sanctioned Regional Plan, major area of extended municipal limits was included in 'G' Zone. For preparing the development plan of Bhiwandi, converting 'G' Zone to Urbanizable Zone was prerequisite. To modify the Regional Plan, Government of Maharashtra, in Urban Development Department, under the provisions of Sub-Section (3) of Section 20 of M R and T P Act, 1966, invited public suggestions and objections on 21.09.1991. Thereafter, the Government of Maharashtra approved the proposed

modifications in the Regional Plan and changed 'G' Zone into Urbanizable Zone (U-Zone) on 24.4.1992. These modifications came into force from 1st July, 1992. Enabled by this modification, Bhiwandi-Nizampur Municipal Corporation prepared and published the Draft Development Plan (Revised) for the period 2013 for the entire area of 26.36 sq km including the Municipal limits extended in August 1993.

14.2 Preparing the Development Plan for Bhiwandi Surrounding Notified Area

Preparing a comprehensive development plan for BSNA, various factors and determinants taken into consideration are:

14.2.1 Factors Guiding Planning Proposals for BSNA

The guiding factors for planning proposals deliberated by the Evaluation Committee in its meeting held on 6th April 2009 are listed as follows:

i. Relevant Policies of the Regional Plan 2011 concerning allocation of land for various uses to guide formulation of planning proposals;
ii. The proposals of the Mumbai Metropolitan Region (MMR) be given due consideration;
iii. The proposals of Comprehensive Traffic and Transportation Study for MMR to guide the transportation network of BSNA;
iv. The planning proposals of various government departments and the approved proposals of private organizations to form part of the proposals and the policies;
v. Issues emerging in meetings held with the major stakeholders including Town Planning Department, Thane, Bhiwandi-Nizampur Municipal Corporation, the B.D.O. office, Bhiwandi and Sarpanches and Panches of village Panchayats to be given due consideration.

14.2.2.1 Determinants of Land Use Distribution and Location

14.2.2.2 Existing Development/Growth Corridors

Various corridors of development identified as continuum of Bhiwandi are as under:

I. Bhiwandi-Junandurkhi-Major District Road-42 Joining State Highway-40 leading to NH-8,
II. Shelar-Vada State Highway-35,
III. Old Thane-Nasik Highway upto its meeting point with NH-3 in Village Vadpe,
IV. New bypass of Thane-Bhiwandi-Nasik Highway, NH-3,
V. Bhiwandi-Kalyan Highway,
VI. Mankoli-Anjur-Surai-Pimpalas Road Forming loop with NH-3,
VII. Bhiwandi-Vasai Major State Highway- No leading to NH-8,
VIII. Urbanization Limitations and Scope,

Various limitations of future urbanization and scope for development are as under:

I. Maximum existing urbanization is upto the contour height of ten (10m) mtr above mean sea level and remaining 20 percent is between 10-20 mtr. The area less than 5 metres above mean sea level is floodable.

II. Villages namely Shelar, Khoni, Katai, Karivali, Rahanal, Kalwar, Kailashnagar, Val, Purne, Kalher, Kashivali, Gundavali, Dapode, Ovali and Gholgaon are built contiguous to the MC area therefore not identifiable as separate entities because of a complete coalesce.

III. The villages namely Ranjnoli, Gove, Pimpalghar, Saravali and Kon, are the outgrowths of Kalyan city towards Bhiwandi along Bhiwandi-Kalyan highway separated by Ulhas river from Kalyan.

IV. Flood Prone Areas,

River Kamvadi, Ulhas and upsurge in creeks are the main sources of flooding described as follows:

I. Kamvadi river that forms the northwestern boundary of Bhiwandi City is below ten-metre contour and it floods the adjoining villages namely Gorsai, Savandhe, Shelar, Khoni, Katai, and Karivali (area that adjoins Bhiwandi city along the nadi). During interaction, local inhabitants informed that flood water rises 5-6 feet high during floods.

II. Villages flooded by the Ulhas river are Kon, Pimpalas, Vehele, Surai, Sarang, Bharodi, Alimghar, Anjur and Dive Anjur (Highway).

III. Parts of villages Ranjnoli, Pimpalas and Gove are low lying and marshy due to frequent floods as a result of surge in Ulhas river,

IV. Parts of villages Dive Anjur (Highway), Purne, Kalher and Kasheli are flooded due to surge of Ulhas river and Kalyan (Thana Creek) Creek.

V. Parts of villages Dive, Kevani and Dunge are prone to floods due to surge in the Basai Creek.

VI. Fragile Areas

Fragile areas identified are as under:

I. 20 metres contour marks the beginning of eco-fragile area that includes forestlands and areas of natural vegetal cover.

II. The extensive brick kiln activity is in the close vicinity of habitation and the eco-fragile areas. This activity is common in the areas formed by the process of deposition over the years as fertile agriculture land- a continuing source of subsistence and sustenance of local inhabitants.

III. Industrial activity is also visible anywhere or everywhere.

IV. Riverfronts are the solid waste dumping sites and untreated industrial and domestic wastes are disposed of into the rivers.

14.2.2.3 Costal Regulations: (As notified by Ministry of Environment and Forest, Government of India)

I. Regulations applicable to the creeks, rivers and estuaries,
II. Permissible land uses,
III. Low and High tide Lines,
IV. Highest flood level.

14.2.2.4 Infrastructure Projects under Considerations

I. The projects in pipeline as are listed as under:
II. Proposal of Mono-Rail from Kalyan to Thane via Bhiwandi,
III. Proposed Delhi-Mumbai Dedicated Freight Corridor (Western Corridor),
IV. Proposals of Comprehensive Transport Study (CTS) related to BSNA.
V. Proposed Multi-modal Corridor from Alibag to Vasai by MMDRA
VI. Chitale Committee Report,
VII. Proposals of Maharashtra Industrial Development Corporation.

14.3 Regional Plan 1996 – 2011

The first Regional Plan for the Mumbai Metropolitan Region was sanctioned in 1973. MMRDA revised the Regional Plan to take into account the changes occurring in population, economy and physical developments in the region. It undertook:

I. Preparation of existing land use by using remote sensing techniques;
ii. Preparation of urban sprawl maps, existing land use maps and urban land use zoning maps for the Region;
iii. Conducting a Multi-purpose Household Survey on sample basis for the region;
iv. Formulating land use proposals for future growth in the Region by integrating the results of various studies;
v. Submitting the Draft Regional Plan for 1996-2011 that was published on the 15th January, 1996 and after following due procedure, the Government approved the Regional Plan for 1996-2011 in September 1999.

14.3.1 Departures from Regional Plan 1973

I. There were departures from the Regional Plan 1973 but only in the development strategy and policies enabling the successful implementation of the development strategy. Some of the main departures are as follows:
II. Regional Plan 1973 observing ever increasing population as the root cause of Greater Mumbai's problems, envisaged restricting Greater Mumbai's population to 7 million by

banning setting up new industries, offices and commercial establishments and by relocating certain economic activities at new locations having growth potentials yet maintaining the city's vitality as the 'Engine of Economic Growth'.

III. Regional Plan 2011, in a paradigm shift, recognized Mumbai playing an important role as generator of national wealth. Not restricting its growth, the approach was to facilitate the development by providing infrastructure and by removing the barriers of economic progress.

IV. Recognizing the need of providing high quality infrastructure especially, telecommunication and transport, office complexes, housing, good living environment, it acknowledged that the objective can be achieved by involving private sector investments in infrastructure development in addition to the public sector investments. Thus, enabling development strategies were worked out in the Regional Plan, 1996-2011.

V. Despite departures from the Regional Plan, 1973, its spatial development strategy of creating a poly-nucleated structure through development of Growth Centres continued to guide strategy of Regional Plan 2011. Firstly, because much efforts and investments have gone into development of Growth Centres; and, secondly, the strategy continues to remain valid even in today's context because multi-nodal or polycentric urban structure offers freedom of location, and larger size of urban area than a mono-centric city.

VI. Land use Categorization-Land use Plan 2011(RP 2011)

VII. RP-2011 proposed zoning system and land use policies not strictly by land requirement for development, but by development potential of an area. Salient features of revised Land Use Plan are as follows:

VIII. Distinguishing 'Development areas' from 'Conservation areas' and making appropriate provision for regulating development in each zone, Zoning system was introduced;

IX. In place of Urbanizable Zone of RP, 1973, two new zones, U1 and U2 were introduced. U1 covers areas of intensive urban development and economic activities, including existing urban centres, new towns, and growth centres, and U2 covers extensive areas having development potential generally outside urban centres. The Plan also suggests in U2 Zone industrial areas of 10 hectare or more for non-polluting, hi-tech industries.

X. For creating adequate employment base, Plan suggested establishing 3 new industrial areas with total area of 560 hectare in Vasai-Virar sub-region, and extension of MIDC's industrial area on Bhiwandi-Kalyan road.

XI. Creation of Recreation and Tourism Zone of 500 m. radius around places of recreation and tourism value, such as, archaeological monuments, religious places, places of natural or scientific interest, wild life sanctuaries, etc.

XII. The introduction of Coastal Regulation Zone for areas up to 500 m. from the high tide line under Environmental (Protection) Act, 1986;

XIII. Activities proposed to be permitted in the Green Zone were enlarged to provide for space extensive activities, such as, large institutions.

XIV. Plan also suggested permitting other selective developments, such as, farmhouses, weekend houses on plots of 2000 sq. m., holiday homes, resorts, amusement parks, film shooting sites etc. with very low intensity development.

XV. A special Green Zone (G-2) is however, proposed in environmentally sensitive areas where only restricted type of development could be permitted.

XVI. To prevent indiscriminate quarrying activity, RP 2011 delineates Quarry Zones and prescribes environmental guidelines for systematic and scientific quarrying, and restoration thereof after quarrying.

14.4 Existing Land use in BNMC

For purposes of comparative land use analyses of BNMC and BSNA, existing land use data of BNMC given in the CDP reproduced is as under (Table 14.1):

Table 14.1 BNMC: Existing Land use of Municipal Area in 1985 as per Development Plan*

Sr. No.	Land Use	Area in Ha.	Percentage	
			of Developable Area	of Total
1	Residential	210.09	36.50	8.70
2	Commercial	6.18	0.98	0.24
3	Industrial	242.57	38.43	9.20
4	Mixed use zone	33.84	2.15	0.51
5	Public / semi-public	48.92	7.75	1.86
6	Transport and Communication	82.00	12.99	3.11
7	Burial and cremation ground	7.594	1.20	0.28
	Total Developed Land	**631.14**	**100**	**23.93**
8	Green Zone, Open Space etc	1634.52	81.53	62.01
9	Forests and Hills	298.00	14.864	11.31
10	Water Bodies	72.20	3.602	2.74
	Total Non-developable area	2004.79	100	76.08
	Total Municipal Area	**2635.94**		**100**

Source – Draft Development Plan (* Reproduced from City Development Plan for Bhiwandi- Nizampur City)

Since existing land use data given in CDP is very old and to draw a comparison, it was digitized from Quick bird imagery (2008) that has been used to prepare the existing land use map of BSNA. Data so analyzed is in the Table 14.2 as follows:

Table 14.2: BNMC: Analysis of Land use Distribution in 2008

Sr. No	Land use Class	Area in Hectares	Percent of Total
A	**Built-up Uses**		
1	Residential	286.21	10.85
2	Industrial	535.51	20.32
4	Warehousing/Godowns	43.81	1.66

5	Mixed	304.23	11.54
6	Public/Semi –Public	33.08	1.25
7	Electric Sub-Stations	3.97	0.15
8	Elevated Service Reservoir	0.75	0.03
9	Water Works and Treatment Plants	5.91	0.22
10	Major Roads*	26.42	1.00
Sub total		**1239.89**	**47.03**
B	**Other Uses**		
10	Agricultural Land	821.72	31.18
11	Forest	137.82	5.24
12	Marshy Land	3.27	0.12
13	Culturable But Barren Land	7.68	0.29
14	Mining Area	-	-
15	Brick Kilns	5.47	0.21
16	Water Bodies	61.96	2.35
17	Open Spaces/Green Belt- Water Supply Pipelines and railways (old)	358.13	13.59
	Sub total	**1396.05**	**52.96**
C	**Total Area (A+B)**	**2635.94**	**100**

Source: Computed From Quick bird (MX) Remote Sensing Data

Based on the above analysis, comparable increase or decrease in area under different land uses in BNMC since 1985 upto 2008 revealed in Table 14.3 is as follows:

Table 14.3 BNMC: Comparable Increase or Decrease in Urbanizable Area (in Hectares)

Sr. No.	Uses	As per CDP	Quick bird data	Difference
1.	Total Area	**2635.94**	**2635.94**	----------
2.	Total Built-up area	631.14	1213.47	582.33 Increase
3.	Forest Area	298.00	137.82	160.18 Decrease
4.	Area under Water Bodies	72.20	61.96	10.24 Decrease
5.	Open Spaces and Green Belt	1634.52	384.55	1249.97 Decrease
Available Urbanizable Area			**838.14**	

It is observed, due to discrepancies in the data of CDP, difficult to authenticate the above data indicated under the head of non-developable area. However, it does indicate the process of urbanization reducing the area that was either under agriculture, open spaces or the water bodies in the year 1985.

14.5 Existing Land use of BSNA

To comprehend land under different uses, analyses of existing land uses were carried with the help of Quick bird (MX) Remote Sensing Data. These images were digitized under different land use categories as adopted by MMRDA for Regional Plan 2011. After completing the process of digitization, preliminary ground truthing exercise was conducted. Thereafter, an intensive reality check exercise, premises-to-premises,

was carried for attaining the final output. The figures of existing land use so attained are shown in the Table 14.4 as follows:

Table 14.4: BSNA: Existing Land Use Distribution in 2008

Sr. No.	Existing Land Use 2008		
	Built-up Land uses	**BSNA Area**	**% of total BSNA**
A			
1	Residential	525.68	3.64
2	Industrial	371.22	2.57
3	Commercial	82.77	0.57
4	Warehousing	651.12	4.51
	Transportation and Communication	75.54	0.52
5	Mixed	118.08	0.82
6	Public/Semi –Public	26.94	0.19
7	Electric Sub-Stations	27.40	0.19
8	Overhead Reservoir	0.36	0.00
9	Water-Works/ Treatment Plants	36.50	0.25
	Open Spaces/ recreation & creaks & water bodies Zone		
10	New Structures*	0.31	0.00
	Total Urbanizable Area		
	Sub-Total	1915.92	13.30
B	Other Uses		
12	Agricultural Land/ Green Zone	8454.15	58.55
13	Forest	1303.76	9.03
14	Marshy Land	1101.68	7.63
15	Culturable but Barren Land	484.47	3.35
16	Mining Area*	155.48	1.08
17	Brick Kilns	128.94	0.89
18	Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc.)	458.93	3.18
19	Open Spaces and Green Belt	437.05	3.03
	Sub-Total	12524.47	86.70
	Total Area (A+B)	**14440.39**	**100.00**

Source: Computed From Quick bird (MX) Remote Sensing Data

Since, land use analyses of BSNA are done for the first time at the local level it is not possible to draw comparable picture of the land use changes over a period.

Table 14.5 Comparative Land Use Figures of BNMC and BSNA in Hectares

Sr. No.	Built-up Land Uses	BNMC	BSNA	Percent of total BNMC	Percent of total BSNA
A					
1	Residential	286.21	525.68	10.25	3.67
2	Industrial	535.51	371.22	20.32	2.59
3	Commercial (See Mixed)*	-------	82.77	------	0.58
4	Warehousing/Godowns	43.81	651.12	1.66	4.54
5	Mixed	304.23	118.08	11.54	0.82
6	Public/Semi –Public	33.08	26.94	1.25	0.20
7	Electric Sub-Stations	3.97	27.40	0.15	0.19

8	Overhead Reservoir	0.75	0.36	0.03	0.002
9	Water-Works/ Treatment Plants	5.91	36.50	0.22	0.25
10	Major Roads	26.42	75.54	1.00	0.53
11	New Structures	-------	0.31		0.002
	Sub-Total	1239.89	1915.92	47.04	13.37
B	**Other Uses**				
12	Agricultural Land	821.72	8454.15	31.18	58.55
13	Forest	137.82	1303.76	5.24	9.03
14	Marshy Land	3.27	1101.68	0.12	7.63
15	Culturable but Barren Land	7.68	484.47	0.29	3.35
16	Mining Area	-	155.48	-	1.08
17	Brick Kilns	5.47	128.94	0.21	0.89
18	Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc.)	61.96	458.93	2.35	3.18
19	Open Spaces and Green Belt	358.13	437.05	13.59	3.03
	Sub-Total	**1396.05**	12524.47	**52.96**	86.70
	Total Area	**2635.94**	**14440.39**	**100**	**100.00**

Source: Computed From Quick bird (MX) Remote Sensing Data

The above Table 14.5 reveals that both in BNMC and in BSNA industrial, warehousing and mixed land uses share the maximum proportion of land utilization. These three major uses occupy 33.52 percent of BNMC area and 7.95 percent of total BSNA followed by residential land use.

14.6 Population Projections: Estimation of Land Requirement and Social infrastructure

Since, projections are conditional statements about the future. These refer mostly to the exercise of extrapolation of the past trends into the future therefore; do not take into account changes in the policies from time to time. There are various methods of projecting population (mathematical, economic and component). The projected population provides bases for assessing the land requirements of different users and commensurate infrastructure. The population projections for BSNA are based on the following considerations as per the decision of Evaluation Committee meeting held on 6th April, 2009:

I. Population projections in the Regional Plan for MMR, 1996-2011,
II. Population projections by the Chitale Committee Report,
III. Projections of Comprehensive Transport Study of MMRDA,
IV. Effect of overspill population from Kalyan, Thane, Mumbai, Bhiwandi etc, and
V. Primary Census Abstract population figures for the Bhiwandi and BSNA.

By using the Ratio Method, the Regional Plan for MMR, 1996-2011 has projected the population of MMR for the year 2011, which also includes Bhiwandi Sub-region. It has been observed that Regional Plan for MMR and Chitale Committee Report, focused on sub-regional level because BSNA was constituted in 2007, hence do not reflect the demographic details and population projections of BSNA. To understand demographic future of BSNA, separate figures

of population projections by using the same ratio method, as applied in Regional Plan for MMR, 1996-2011 and simple decadal growth rate computing technique used in Chitale Committee Report are derived given as under (Table 14.6 and Table 14.7a and 14.7b):

Table 14.6 Projections of BSNA and Bhiwandi-Sub Region that Includes BNMC

Area/ Region	Population					Decennial Growth (percent)			
	1971	1981	1991	2001	2011	1971-81	1981-91	1991-2001	2001-11
Bhiwandi Sub- Region	157,300	*295,484	497,300	748,247	1019,334	87.84	68.30	50.46	36.22
BNMC	-	*216,242	382,951	582,614	790,494	-	77.09	52.13	35.68
BSNA*	**--**	**79,242**	**114,349**	**165633**	**228,840**	**-**	**44.30**	**44.84**	**38.16**

Source: Mumbai Metropolitan Region Plan, 1996-2011

**** (Census indicates these figures as 1, 15,298 persons) that have been adopted in the following table.***

The above Table 14.6 reveals that population of Bhiwandi Sub-region (BNMC and BSNA) is expected to cross one million by the year 2011. The population of BNMC and BSNA is estimated to reach at 790,494 and 2, 28, 840 persons by 2011, respectively. The estimated proportionate share of population between BNMC and BSNA, in the year 2011, for the Bhiwandi Sub-Region would be 77.50percent and 22.50percent, respectively. It also reveals a declining growth trend since 1971 onwards.

Table 14.7 (a) Population Projections for MMR, BSR, BNMC and BSNA

Region/ Sub-Constituents	Population Projections						
	1971	1981	1991	2001	2011	2021	2028
MMR	77,77,531	11,078,029	145343	*18486559	*22440973	28410271	35967403
Bhiwandi Sub-Region(BSR)	1,57,300	194,540*	493,419	764,374	1019,334	1289,826	1632,920
Per cent of BSR to MMR	2.02	1.75	3.39	4.13	4.54	4.54	4.54
BNMC	79,576	115,298*	379,070	598,741	793,756	1004,388	1271,556
Per cent of BNMC to BSR	50.59	59.27	76.82	78.33	77.87	77.87	77.87
BSNA*	-	79,242	114,349	165,633	225,578	285438	361,364
Per cent of BSNA to BSR	-	40.73	23.18	21.67	22.13	22.13	22.13

Source: Mumbai Metropolitan Region Plan, 1996-2011 and the Analysis

Table14.7 (b) Estimated Decadal Population Growth for MMR, BSR, BNMC and BSNA

Region/ Sub-Constituents	Decennial Growth (percent)					
	1971-81	1981-91	1991-2001	2001-11	2011-21	2021-31
MMR	42.43	31.20	27.20	21.40	26.60	26.60
Bhiwandi Sub-Region	23.67	153.63	54.91	33.35	26.54	26.60
BNMC	44.89	228.77	57.95	32.57	26.54	26.60
BSNA*	-	44.30	44.85	36.19	26.54	26.60

Source: Mumbai Metropolitan Region Plan, 1996-2011 and the Analysis

Table 14.7a and 14.7b bring out the estimated population of MMR, Bhiwandi sub-region, BNMC and BSNA for the year 2028-31. Notably, the MMR has projected the population of Bhiwandi Sub-region upto the year 2011 only. For deriving the population of BSNA using the ratio method, it is statistically required to estimate the population of MMR for next two decades.

Therefore, the tri-decennial average of (1981-91; 1991-2001; 2001-2011) i.e. 26.60 percent has been adopted for projecting the population of following two decades-2021 and 2028-31.

14.6.1 Population Projections by Other Agencies

i. MMR Plan 2011

MMRDA in its report has analyzed declining decadal growth rate of Bhiwandi sub-region that was 87.85 percent in 1981, reduced to 50.46 percent in 2001 and further expected to fall to 36.23 percent by 2011.

ii. Chitale Committee

While agreeing with MMR projections the Chitale Committee has adopted the declining trend in projecting future population growth. The Committee assumed the growth rate of 46.26 percent in 2001 and predicted the growth rate of 21.80 percent in 2028. Table-14.8 below gives the comparative picture:

Table 14.8 Comparative Population Projections for Bhiwandi Sub-Region

Sr. No.	Year	MMR Plan		Chitale Committee Report	
		Population	Decadal Growth	Population	Decadal Growth
1	1971	157,300		-	
2	1981	*295,484	87.85percent	-	
3	1991	497,300	68.30percent	497,300	
4	2001	748,247	50.46percent	727,439	46.269percent
5	2011	**10,19,334**	36.23 percent	1004,847	38.026percent
6	2021	-		1352,847	34.738percent
7	2028	-		1,647,815	21.804percent

Source-MMR Plan and Chitale Committee Report

MMR Plan has projected the population of 10, 19,334 persons by 2011 and the Chitale Committee has projected a population of 10, 04, 847 persons for the same period which almost is in agreement with the MMR Plan predictions. Chitale Committee has projected a population of 16, 47,815 persons by 2028 for Bhiwandi Sub-Region. Adopting the same method, BSNA population can also be projected for the year 2028 as given in Table-14.7a

Table 14.9 Comparative Population Projections for BSNA

Census Year	MMR Plan		Chitale Committee Report	
	Population	Decennial Growth	Population	Decennial Growth
1981	79,242	-	-	
1991	114,349	44.30percent	114,349	-
2001	165,633	44.84percent	165,633	44.84percent
2011	228,840	38.16percent	228,840	38.16percent
2021	-		303,714	32.71percent
2028	-		3,69,934	21.80percent

The Table 14.9 reveals the increase in absolute figures at a declined percentile growth rate. On this declining trend, the projected population of BSNA by 2028 would be 3, 69, 934

persons (3.7 Lakhs) as per Chitale Committee. However, CDP of BNMC has projected 21 lakhs population for BNMC by 2030. If the averaged 77.87 percent share of BNMC in the BSR population is continued then the anticipated population of BSR would be about 26.00 lakhs by 2030 and the BSNA population will be 5.75 lakhs.

It is prudent to mention here that a population of 21 lakh cannot accommodate itself in about 1240 hectares that gives the density of 1693 (rounded to 1700) persons per hectare or 688 persons per acre. If the town density of 600 persons per hectare is assumed for BNMC, the total population that can be accommodated in BNMC will be 15.75 lakhs persons by 2030. Therefore, the remaining population of 6.25 lakhs persons will spill over to BSNA. Thus, the total population of BSNA will be 5.25+5.75=11 lakhs by 2028.

14.6.2 Induced Growth- A Departure from Population Projection Techniques

It is pertinent to mention here that since BSNA was constituted in 2007, the population projections of different sources referred above have not considered the induced growth. The proposed land uses, development strategies for BSNA and supported by the integrated transportation network shall open up new investment avenues and job opportunities. The new areas of investment listed are as under:

i. Industrial Development;
ii. Warehousing and Transportation;
iii. Whole sale and Warehousing;
iv. Commercial Complexes- City Centre and District Centres;
v. Construction Activities- Infrastructure Development;

Once BSNA, which is the backyard of Mumbai, opens up for regulated development it will be a place to accommodate the spillover of the BNMC, Kalyan, Thane or the Mumbai in addition to the in-migration generated by new job opportunities.

14.7 Density of Population-BNMC

To assess the intensity of use of land it is put, the population density of Bhiwandi city, (taken as referral only) was studied which is varying from ward to ward. The Gross population density in 2001 as per Census of India was 214.18 persons per hectare. City Development Plan has analyzed population densities in eleven planning units as under:

Table 14.10 Population Density of BNMC

Planning Unit	Gross Population Density	Net Population Density
I	200	681
II	160	2259
III	15.5	1940
IV	227	2862
V	35	1110
VI	87.9	3914

VII	127	1604
VIII	295	1219
IX	517	2721
X	280	1362
XI	170	4725

Source: City Development Plan, Bhiwandi-Nizampur

Table 14.10 reveals that gross density is varying from 15 persons to 517 persons per hectare and net density ranges between 681persons to 4725 persons per hectare.

14.7.1 Work Participation Rate and Average Household Size - BNMC and BSNA

In Bhiwandi the ratio of workers to non-workers has decreased from 1:1.47 in 1981 to 1:1.43 in 1991 to 1:1.39 in 2001. Workforce in BNMC is largely engaged in the secondary and tertiary sectors sharing 96 percent and 98 percent in 1981 and 2001 respectively. BSNA continuum of BNMC is dependent on it for secondary and tertiary activities therefore, together form a cohesive unit. The table 14.11 gives the comparative picture as under:

Table 14.11 Comparative Work Participation Rate and Average Household Size of BNMC and BSNA

Particulars	Census Years								
	1981			1991			2001		
	BNMC	*BSNA*	Total	BNMC	BSNA	Total	BNMC	*BSNA*	Total
Population	115298	*79242*	194540	378546	*114349*	492895	598741	*165633*	764374
Households	19511	*14696*	34207	70080	*21726*	91806	110408	*33359*	143767
Total Workers	46719	*32777*	79496	155788	*52821*	208609	250227	*74476*	324703
Household Size	5.9	*5.3*	5.4	5.4	*5.2*	5.3	5.4	*5*	5.3
Workers/ Per 100 HH	239.4	*223*	232.3	222.3	*243.12*	227.22	226.6	*223.2*	225.85
Percent of Workers to Population	40.52	*41.33*	40.86	41.15	*46.19*	42.32	41.8	*44.9*	42.5

Table 14.11 reveals that the ratio of total workers to 100 persons increased during the last three decades. In case of BSNA, it was 41.33 percent in 1981, 46.19 percent in 1991 and 44 .9 percent in 2001. The ratio of total workers to 100 households remained the same during 20 years with little increase during 1980s. In 1981, the average household size in BSNA was 5.3, which declined to 5.2 in 1991 and further declined to 5 in 2001. Likewise, BNMC has also shown a declining trend in size of household from 1981 to 2001.

14.7.2 Influence of BNMC and Kalyan on BSNA

Like any other urban agglomeration, Bhiwandi has also sprawled over its immediate surroundings i.e. BSNA. Resultantly, Villages of BSNA namely, Savandhe, Shelar, Khoni, Katai, Karivali, Purne, Kopar, Kalher, Val, Gundavali and Dapode have lost their identity by coalescing themselves with Bhiwandi. Similarly, Villages like Ranjnoli, Gove, Pimpalghar and Kon on the

NH 222 have emerged as corridor extension of Kalyan. Some of these villages are categorized as census towns Table 14.12.

Table14.12 BSNA: Census Towns and their Population

Sr. No.	Census Towns	Population 1981	Population 1991	Population 2001
1	Khoni	6,139	13,144	22,686
2	Kon	5,764	9,197	15,159
3	Katai	3,398	5,324	11,252
4	Shelar	3,299	4,516	10,612
	Total	18,600	32,181	59,709

These four census towns constituted about 36 percent of total population of BSNA in 2001. Other four villages are in the in the process of making towns that contributed about 13.43 percent of total BSNA population in 2001. These villages are shown in the Table 14.13 below:

Table 14.13 BSNA: Villages in the Making of Towns and their Population

Sr. No.	Villages	Population- 2001
1	Kalher	7,485
2	Rahanal	6,906
3	Kambe	5,086
4	Purne	2,772
	Total	**22,249**

The population of four census towns and the four villages in the making of towns put together constituted little less than half of the total BSNA population. Since there is a visible impact of Bhiwandi, Kalyan and Thane on the BSNA, future growth of BSNA will be influenced by these urban centres.

All exiting ground realities, factors that impact the future planning explained in the foregoing paragraphs including the Regional Plan 2011 are given due consideration and weightage in projecting the future population.

CHAPTER - XV

Land Use Zoning: Proposed Land Uses

15.1 Prologue

Proposed Land Use Plan for MMR Plan 1996-2011 distinctly reveals various land use zones. However, it clarifies that these are to be treated as indicative for taking into consideration while preparing detailed plans for the respective local areas. A separate plan for the purposes of statutory development control is to be prepared excluding the areas already in the jurisdiction of Municipal or Special Planning Authorities. It further clarifies that for operational purpose, the latter plan will be translated on the revenue village maps of larger scale in due course of time. The detailed land use provisions and the form of development envisaged under each zone is to be spelt out separately in the Development Control Regulations also specifying the type of development permissible in Gaothans and Schemes relating to expansion thereof.

15.2 Location of Proposed Land Use

Guided by the scheme envisaged in the Regional Plan, the land use zoning or the proposed location of different kinds of land uses in BSNA is based on the following parameters:

I. Recommendations of the MMR Plan 2011,
II. Predominance of existing land use at a particular location or direction,
III. Associating the support land use in the close proximity for adopting walk-to-work culture without compromising the environmental concerns,
IV. Growth potentials of an activity at a particular location,
V. The transportation network proposed in the Regional Plan 2011,
VI. Suggestions of Lea Associates and emerging growth corridors,
VII. The flooding factor,
VIII. Costal Regulation Zone and eco-sensitive areas, and
IX. Proposals of City Development Plan of BNMC.

15.3 Land Use Categorization

Keeping in view the existing land use and the land use categorization for the MMR, the categorization adopted for proposed land use zoning is follows:

I. Residential;
II. Commercial;
III. Industrial;
IV. Transportation and communication;
V. Public Utilities;

VI. Public and Semi-Public;

VII. Open Spaces including Recreational and Tourism;

VIII. No Development Zone-Green Zone i.e. Rest of the BSNA including Costal Regulation Zone, water bodies and forests.

15.4 Population Planned for

Study reveals a declining percentile growth rate of population. On this declining trend, the Chitale Committee has projected the population of BSNA 3, 69, 934 persons (3.7Lacs) by 2028. However, CDP of BNMC has projected BNMC population of 21 lakh persons by 2030. Both BNMC and BSNA shared 77.87 percent and 22.13 percent population of the BSR, respectively. If this continues then the anticipated population of BSR would be about 2.6 millions by 2028 and the BSNA population will be 0.575 million persons.

As stated in 14.6.1, BNMC cannot accommodate 2.1 million persons on 1240 hectares at a density of 1693 (rounded to 1700) persons per hectare or 688 persons per acre. Its maximum carrying capacity is to accommodate 15.75 lakh persons by 2030. The remaining population of 5.25 lakhs persons will spill over to BSNA. Therefore, BSNA will be accommodating 1.1 million persons by 2028. With a recommendation of plan review in 2021 the proposed population of BSNA by 2028 is being assumed 1.2 millions for assessing social infrastructure i.e. one lakh more than the calculated population. Thus, land allocation for different uses and the commensurate infrastructure assessed is for 1.2 millions.

Since BSNA proposed is for metropolitan development of 1.2 million and as a new emerging regional centre by 2028, with a review in 2021 after census of population, the new investments will generate a total of about 3.0 Lakhs direct employment and an equal number of indirect job opportunities considering 50 percent work participation ratio *(Table 4.8)*.

The total BSNA is computed as 14440.39 hectares. The urbanizable area out of it is about **10620.24** hectares, which accounts for 73.54 percent of the total BSNA. The town density of urbanizable area is about 113 persons per hectare and of the total BSNA, it is 83 persons per hectare. However, for purposes of analysis reckoned is density of urbanizable area.

15.5 Land Use Distribution and Divisions into Planning Units

15.5.1 Proposed Land Use Distribution in BNMC

To draw a comparison between CDP of BNMC and the proposed land uses for the BSNA the proposed land use data from the CDP reproduced is in Table 15.1 as follows:

Table 15.1 BNMC: Proposed Land Use Distribution of Municipal Area as per Development Plan*

Sr. No.	Land Use	Area in Hect.	Percentage	
			of Developable	of total
1	Residential	1220.76	57.47	46.31
2	Commercial	15.90	0.75	0.6
3	Industrial	195.05	9.18	7.40
4	Mixed use zone	60.75	2.86	2.30
5	Public / semi-public	136.00	6.40	5.16
6	Transport and Communication	390.55	18.39	14.83
7	Open spaces, parks and playgrounds	92.02	4.33	3.49
8	Burial grounds and cremation grounds	13.20	0.62	0.50
	Total Developable Land	**2124.23**	**100**	
9	Forests and Hills	290.42	------	11.02
10	Water Bodies	70.72	------	2.68
11	No Development Zone & Green Belts	150.57	------	5.71
	Total Non-developable Land	511.71	-------	
	***Total Area**	**2635.94**	------	**100**

Source – Draft Development Plan 1993-2013 (Revised) (* Reproduced from City Development Plan for Bhiwandi Nizampur City)

Table 15.1 reveals that the land proposed for residential use to accommodate about 21 lakhs persons by 2030 is 1220.76 hectares. The residential density thus works out to 1720 persons per hectare and 988 persons per hectare of the developable area. However, if the area of 2635.94 hectares within the BNMC limits is correct, the town density will be 797 persons per hectare that belies all population density norms adopted for any futuristic city. It requires a relook. However, one aspect of planning that cannot be ignored is that once BSNA opens up for future urbanization there will be a tremendous pressure for housing and other related social infrastructure? Because, BSNA will not only open up for new comers, the spillover of nearby urban centers such as Thane, Kalyan and Mumbai including Bhiwandi will also get the accommodation.

15.5.2 Delineation of planning units for population distribution and land use reservation

For detailed land use proposals, BSNA is divided into planning sectors as planning units. The criteria adopted for delineating the planning units is as follows:

i. Continuity broken by either existing or proposed road network- Major roads 30 meters and above (with exceptions at some places);
ii. Physical such as rivers, drainage channels, hills etc.

iii. Or manmade barriers such as railway lines, water pipelines etc

The sectors alphabetically arranged from A to N are further subdivided adding numerical number to the alphabet viz. Sector A has sub-divisions A1, A2, and so on.

15.5.3 Proposed Land Use Distribution in BNSA-Variation from the MMR Plan (2011) Proposals: (having regard to Section 27 of the Maharashtra Regional and Town Planning Act, 1966)

In the MMR Plan urbanizable area of BSR that includes BSNA and BNMC area is divided into two zones namely;

a. U1- intensive use,
b. U2- extensive use

The total area under U1 and U2 within BSNA measures about 6300 hectares including the area indicated for the industrial development along Vada road and the Bhiwandi-Kalyan road. To meet the requirement of projected population of 1.2 million the urbanizable area has been expanded beyond the U1 and U2 zones indicated on the Land Use Plan of MMR Plan 2011. On account of the proposals to plan for a population of 1.2 million the proposals of the Draft Development Plan of BSNA much beyond the U1 and U2 because these zones were to cater to the requirement upto 2011 whereas the Draft Development Plan is for the year 2028. Hence, the modifications in the Regional plan proposals are imminent. The modifications or deviations listed are as under:

i. About 200 hectares area of villages Vaghivali, Kolhivali, Kawadkhurd and newly carved village Rohini and the area measuring about 26 hectares of Borpada adjoining hills is proposed for ground water recharge therefore from U2 to no development zone for the time being.
ii. Likewise the area measuring about 200 hectares of villages Dhamangaon and Vadpe in the north of the proposed Multi-modal corridor is proposed for ground water recharge therefore categorized as no development zone from U2;
iii. All proposals in the eastern villages viz. Yavai, Elkunde, Shivnagar, Sonale Kasbe, Gholgaon, Rajnagar and Thakurgaon are the new proposals where the Government has already approved the projects by allowing the modifications in the MMR Plan 2011;
iv. All proposals in the southern part of BSNA are linked with the new projects such as the Multi-modal corridor of MMRDA from Alibag to Vasai, new proposed route of Suburban Railways, and a number of permissions already granted in villages, Mankoli, Dive Anjur, and Anjur. The area of villages Alimghar, Bharodi, Surai, Sarang and Pimpalner, which is clear of costal regulations, has come within urbanization.

As stated above in addition to about 6300 hectares urbanizable area of MMR 2011, the total area within the planning proposals now measures about 10620.24 hectares i.e. an addition of about 4320.24 hectares to meet the projected requirement of the Development Plan, 2028. This modification is within the scope of Section 27 of Maharashtra Regional and Town Planning Act, 1966**.** Rest of BSNA is NDZ, under Forests or Water Bodies, etc. measuring about 3820.15 hectares. The total computed BSNA measures about 14440.39 hectares. The distribution of land under different proposed land uses is as in the Table 15.2 below:

Table 15.2 BSNA: Proposed Land Use Distribution

Sr. No.	Land Use	Area in Hectares
i	**Residential**	4049.88
	R1 With	1118.82
	R2 with	2579.91
	RH	305.65
	Gaothans	45.50
ii	**Commercial including Warehousing**	**820.97**
iii	**Industrial**	**2446.20**
	Service Industry SI	1014.40
	I-1	569.10
	I-2	666.20
	I-3 Theme Park	196.50
iv	**Transportation and communication**	**1658.86**
v	**Public & Semi- Public/Public Utilities**	**610.15**
vi	**Forests**	**1629.37**
vii	**Open Spaces (Gardens and Play Grounds),**	**1034.18**
viii	**No Development Zone-Green Zone**	**1693.73**
ix	Water Bodies,(Rivers, inland lakes, ponds, creeks, wells etc.)	**497.05**
	Grand Total	**14440.39**

The comparative analysis of the existing and proposed land uses of BSNA are given in table 15.3 below:

Table: 15.3 BSNA: Comparative Analysis of Existing and Proposed Land Use (in hectares)

Sr. No.	Comparative Analysis of Existing Land Use			Proposed Land use	
	Built-up Land uses	**BSNA Area**	**% of total BSNA**	**BSNA Area**	**% of total BSNA**
1	Residential	525.68	3.64	4049.88	28.05
2	Commercial	82.77	0.57	820.97	5.69
3	Warehousing	651.12	4.51		
4	Industrial	371.22	2.57	2446.20	16.94
5	Transportation and Communication	75.54	0.52	1658.86	11.49
6	Mixed	118.08	0.82		
7	Public Semi-Public/ Public Utilities	91.2	0.63	610.15	4.23
8	Agricultural Land/ Green Zone, Marshy Land, Culturable but Barren Land, Mining Area, Brick Kilns, Open Spaces and Green Belt Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc.)	11220.70	77.70		
9	Forest	1303.76	9.03	1629.37	11.28
10	Garden/Play Ground etc.			1034.18	7.16
11	No Development Zone (Green Zone-NDZ)			1693.73	11.73
13	Water Bodies (Rivers, inland lakes, ponds, creeks, wells etc.)			497.05	3.43
	Total	**14440.39**	**100.00**	**14440.39**	**100.00**

15.5.4: Description of Land Uses

15.5.4.1 Residential:

Area measuring about 4049.88 hectares, including the Gaothan areas and their expansions, is proposed under residential use for a population of 1.2 million persons by 2028 at an average residential density of about 300 (296) persons per hectare. To wipe out the existing backlog of housing for labour, (estimated about one lakh), and to cater to the housing demand of middle and higher income group, residential area has been sub-grouped as Residential-1 (R1), Residential-2 (R2) and Rental Housing (RH) explained as follows:

i. R1 is the sub-group located on the roads 15metres to less than 30 metres right-of-way where FSI 1.5, including premium of 0.5 is permissible, however, the premium in sub-group B-26 to B-32 of Sector-B in the north of Freeway in continuation of Multi-Modal corridor adjoining the hill forest is not proposed because the area is ecologically fragile and is also the watershed,

ii. R2 is the sub-group located on the roads with right-of-way 30 metres and above where FSI 2 with premium of 1.00 is permissible,

iii. RH will be permissible as per the applicable Rental Housing Policy of the Government of Maharashtra.

Sector-wise distribution of residential area is as follows (15.4):

Table 15.4: Sector-wise Distribution of Residential Land Use

Sectors	Residential				
	R1	R2	RH	Gaothan (Within NDZ)	Grand Total
A	27.48	255.01	34.46	3.00	319.95
B	169.72	329.71	-	9.50	508.93
C	97.34	166.52	-	8.00	271.86
D	46.18	235.88	-		282.06
E	14	270.70		19.00	303.70
F	113.8	243.89	-	2.00	359.69
G	83.98	82.05	-	1.80	167.83
H	-	-	-	0.80	0.80
I	345.56	178.30	11.76	-	535.62
J	75.96	**384.69**	-	-	**460.65**
K	40.78	207.84	179.06	1.40	429.08
L	104.02	225.32	-	-	329.34
M	-	-	80.37	-	80.37
N	-	-	-	-	-
Total	**1118.82**	**2579.91**	**305.65**	**45.50**	**4049.88**

15.5.4.2 Commercial

This category of land use includes warehouses, merchandise, wholesale market and city centre. Total proposed area under commercial activities is 820.97 hectares detailed in the table 15.5 as follows:

Table 15.5: Sector-Wise Distribution of Commercial Land Use

Sectors	Commercial					
	WHS	VM	FM	SC	Other	Grand Total
A	-	3.20	-	4.16	-	7.36
B	-	6.00	-	8.10	-	14.10
C	5.26	-	-		-	5.26
D	-	2.40	1.40	1.50	-	5.30
E	-	1.80	-	2.90	-	4.70
F	138.05	1.40	-	1.40	-	140.85
G	-	-	-	-	26.10	26.10
H	-	-	-	-	13.10	13.10
I	4.00	1.20	4.40	-	137.30	146.90
J	19.70	32.20	1.70	1.30	16.30	71.20
K	-	2.00	-	6.20	-	8.20
L	139.80	0.50	-	1.50	10.50	152.30
M	97.43	0.00	-	-	-	97.43
N	-	-	-	-	128.17	128.17
Total	**404.24**	**50.70**	**7.50**	**27.06**	**331.47**	**820.97**

Note: WHS (Warehousing/storage godowns), VM (Vegetable market), FM (Fish market), SC (Shopping Complex)

The criterion for permissible FSI will be locational, as applicable in the case of residential use, explained as follows:

i. Commercial areas subject to the plot size located on the roads 15metres to less than 30 metres right-of-way FSI 1.5 including premium of maximum 0.5 is permissible, however, the premium in sub-group B-26 to B-32 of Sector-B in the north of Freeway in continuation of Multi-Modal corridor adjoining the hill forest is not proposed because the area is ecologically fragile and is also the watershed,

ii. Commercial areas subject to the plot size located on the roads with right-of-way 30 metres and above the maximum FSI 2, including premium, is permissible,

iii. However, in the case of warehouses/godowns in the commercial zone FSI for warehouse users shall be limited to 1 within the commercial land use mentioned as (WHS). Existing warehouses cannot avail FSI upto 2 if other commercial use is proposed on these lands after demolishing the existing warehouse/godown on payment of premium (as applicable to commercial land use) subject to plot size and location as mentioned at i. and ii. above.

iv. In Growth Centre/City Centre sector N, FSI upto 2 for the entire commercial area is proposed on payment of premium beyond FSI 1.

15.5.4.3 Industrial

The total area under this land use proposed is about 2446.20 hectares. The existing industrial concentrations adjoining BMNC limits are proposed expansions of the existing and industrial zones in Sectors G, E, and I are for the expansion programs of MIDC. Another category is the theme parks in sector-H measuring about 196.50 hectares. The locational criterion for industrial use is follows:

i. Distribution is guided by the permissions by the government;
ii. Program of the MIDC to expand its industrial base in BSNA;
iii. Areas where permissions granted are for the service industry, including warehousing, the expansion is proposed for the service industry.
iv. General industries including industrial theme parks are industrial.

Accordingly, four groups formed are namely Service Industry (SI), General (I-1), General (I-2) and the theme parks including SEZ (I-3), the details are in the table 15.6 as follows:

Table 15.6: Sector-Wise distribution of Industrial Land Use

Sectors	Industrial				Sector-wise Total
	SI	I-1	I-2	I-3	
A	-	-	-	-	-
B	222.13	-	-	-	222.13
C	56.19	460.77	-	-	516.96
D	-	108.33	-	-	108.33
E	-	-	47.20	-	47.20
F	75.78	-	-	-	75.78
G	-	-	484.80	-	484.80
H	-	-		196.50	196.50
I	-	-	80.10	-	80.10
J	-	-	54.10	-	54.10
K	-	-	-	-	-
L	551.40	-	-	-	551.40
M	108.90	-	-	-	108.90
N	-	-	-	-	-
Total	**1014.40**	**569.10**	**666.20**	**196.50**	**2446.20**

Industrial (SI): In **t**his proposed zone, permissions granted are largely for Service Industry (SI). This zone is true reflection of mixed land uses with permissions granted or otherwise coexisting with service industry including warehousing/cold storage etc. Since, service industry has maximum permissions in this zone therefore, designated as (SI). The total area of this zone is 1014.40 hectares. Future permissions in this zone will be as detailed in Table 26 (Appendix D) of the DCR for BSNA.

Industrial (I-1): This is primarily for expansion of existing industrial concentrations that emerged with or without permission of the competent authority. These concentrations are largely in continuity of the existing city meant for general industry as permitted by the competent authority. However, this zone will also permit the development of Theme parks as sanctioned by the competent authority. The total area of this zone measures 569.10 hectares.

Industrial (I-2): (Primarily for MIDC)

This is the zone of industrial mix or general industry as developed by the MIDC or as allowed by the Government. Since the proposals and programs of MIDC, largely fall in this zone, it is proposed for MIDC or as decided by the state Government or the Planning Authority. However, this zone will also permit the development of Theme parks, including product specific Special Economic Zones in addition to the proposals as in I-3. The total area in this zone is 666.20 hectares.

Industrial (I-3): This zone of theme parks includes dedicated industrial parks such as Biotech and IT, Food Processing, Textiles, Pharmaceuticals, Footwear to name a few. It will also permit product specific Special Economic Zones. Total area for this purpose is 196.50 hectares.

15.5.4.4 Transportation and Communication

Apart from the area under the major arteries, the roads connecting major arteries, and the proposed interchanges/under or overpasses, the land has been earmarked for the transportation zone that will include:

i. Freight Stations
ii. Container Depots
iii. Truck Terminus
iv. Bus Stands
v. Railway Stations
vi. Integrated Railways-Bus Terminus and Integrated Rail-Bus Transit (IRBT)

Total area under Transportation and Communication is 1658.86 hectares including City Passenger Railway Station integrated with Regional Bus Terminal and IRBT. Since Delhi-Mumbai Freight Corridor is along the existing Dive-Vasai railway line, no separate corridor has been proposed. The routes of the suburban railway and the monorails indicated in the Development Plan are tentative. Hierarchy of roads and their nomenclature including the proposed interchanges, railway over-bridges, under/over passes (Subject to the DPR) are given in the Transport Network (Chapter XVII) of the Development Plan. The sites reserved for various purposes of transport measure 78.68 hectares shown in table 15.7, the remaining area 1580.18 hectares is under the proposed and existing roads and railways within BSNA.

Table15.7 Sector-wise Distribution of Land under Transportation facilities etc.

Sectors	BS	RS	JF	IRBT	TF	Parking	Sector-wise Total
A	0.28	-	-	-	-	-	0.28
B	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-
F	-	-	-	-	-	0.60	0.60
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
I	-	-	7.30	-	-	-	7.30
J	-	-	7.00	11.10	-	-	18.10
K	-	-	6.00	-	-	-	6.00
L	-	-	-	-	22.10	-	22.10
M	-	-	-	-	7.90	0.70	8.60
N	9.60	6.10	-	-			15.70
Total	**9.88**	**6.10**	**20.30**	**11.10**	**30.00**	**1.30**	**78.68**

15.5.4.5 Public, Semi-Public and Public Utilities

i. Public utilities

To meet the requirement of public utilities such as water supply, power, disposal system etc. land measuring about **137.67** hectares has been proposed in different sectors. These sites

include the proposal of Solid Waste Management, Sewerage Treatment Plant/Effluent Treatment Plant and Compost Plant.

Table 15.8: Sector–wise Distribution of Land under Public Utilities

Sectors	Public Utilities (Area in Hectares)				Sector-wise Total
	STP	Elect. Sub-station.	WW	O	
A	-	-	-	-	-
B	-	-	5.38	-	5.38
C	-	-	-	-	-
D	2.03	-	-	-	2.03
E	-	-	10.83	-	10.83
F	-	-	13.23	-	13.23
G	-	1.86	23.68	-	25.54
H	-	-	13.90	-	13.90
I	3.65	-	-	-	3.65
J	-	-	-	1.84	1.84
K	-	18.80	-	-	18.8
L	-	-	-	7.16	7.16
M	2.01	-	-	-	2.01
N	-	-	33.30	-	33.30
Total	**7.69**	**20.66**	**100.32**	**9.00**	**137.67**

ii. Public and Semi-Public

To meet institutional requirements both in public and in private sectors, area measuring **472.48** hectares has been proposed at different locations. *(The reservation details in each sector are in tables 15.12 and 15.13.)* However, it is pertinent to mention that land reservation under this category where sub-use not indicated on the drawing of draft Development Plan; government may permit the public utilities in public interest without affecting the sites reserved for social infrastructure. Distribution of land use in each sector including solid waste management is as in the table 15.9 below:

Table 15.9: Sector–wise Distribution of land under Public and Semi-Public Use

Sectors	Public and Semi Public (Area in Hectares)
A	30.95
B	38.10
C	11.78
D	20.50
E	15.30
F	23.70
G	9.20
H	0.20
I	41.20
J	230.60
K	24.75
L	16.30
M	4.10
N	5.80
Total	**472.48**

15.5.4.6 Open Spaces (Gardens, Play Grounds, Ground water Recharge and Recreation)

BSNA is planned for a population of 12 Lakhs persons by 2028 with a review after 10 years. The required provision of gardens and play grounds have been worked out on the norms of Maharashtra Govt. i.e. Play Ground reservation of 0.40 hectare per 1000 persons and Garden reservation of 0.20 hectare per 1000 persons. This category includes the areas proposed for playgrounds, gardens, recreation and rainwater harvesting for ground water recharging. It is pertinent to mention here that the projected population for the next 10 (ten) years is 5.75 lakh persons therefore, the provision of open spaces in the DP 2028 is 17.98 sq metres per person for the next ten years and 8.61 square metres per person for the projected population of 12 lakhs by 2028. Total area under open spaces is 1034.18 hectares shown in Table 15.10.

Table 15.10: Sector–wise Distribution of Area of Recreational Gardens and Playgrounds

Sectors	Reservations		Area in Hectares
	Recreational Gardens	Play Grounds	
A	8.52	12.90	21.42
B	64.90	46.75	111.65
C	4.20	12.50	16.7
D	2.62	9.80	12.42
E	4.91	11.39	16.3
F	18.07	12.30	30.37
G	19.02	26.09	45.11
H	40.47	39.93	80.4
I	13.50	15.80	29.3
J	116.87	35.66	152.53
K	245.07	62.87	307.94
L	178.64	4.20	182.84
M	-----	0.4	0.4
N	3.80	24.00	27.8
Total	**720.59**	**313.59**	**1034.18**

It is evident from the above table that the total area under the Playgrounds measures 313.59 hectares; whereas as per the space norms of the Government of Maharashtra, 166.41 more hectares are required to meet the total play grounds requirement of 480 hectares. Though sufficient land is available in Sectors B, H, J, K and L, as is evident from table 15.10 above, yet anymore provisions for Playgrounds, will be lopsided and spatially not properly distributed. This peculiar position is on account of following ground realities:

i. Existence of Rivers Ulhas and Kamvadi with necessary buffer zone due to coastal regulations,
ii. Existence of major water pipelines from northeast to southwest direction and presence of water works,
iii. Existence of high tension power-lines with necessary safety zone as per electricity Rules,
iv. Forest lands within and outside urbanizable area,
v. Solid waste (fill) site of 209.20 hectares within urbanizable area.

However, it is pertinent to mention here that at least 20% area in the larger layout plans will be available as open spaces that could be put under the palygrounds as well for rational spatial distribution within the sectors out of the following land uses:

i. Residential 4049.88 hectares;
ii. Commercial 820.97 hectares;
iii. Industrial 2446.20 hectares.

Since total 7317.05 hectares area will be planned, 20% of this (1463.41 hectares) will be necessary open spaces. The required area for playgrounds measuring 166.41 hectares can be conveniently met from these necessary open spaces.

15.5.4.7 Green Zone (No Development Zone)

The remaining area of BSNA measuring about **3820.15** hectares is under this category. In addition to agriculture and its ancillary uses, it includes forests, water bodies such as rivers, estuaries, drainage channels, lakes and beautification thereof given in Table 15.11 below:

Table 15.11: Distribution of Land in Green Zone (No Development Zone) Area in Hectares

Sectors	Forests	Green Zone	Lake Beautification and Water Bodies	Sector-wise Total
A	30.34	259.30	39.60	329.24
B	751.20	664.15	70.10	1485.45
C	2.73	-	39.96	42.69
D	-	-	21.55	21.55
E	155.30	434.25	2.70	592.25
F	276.60	165.30	34.30	476.20
G	77.00	-	5.00	82.00
H	269.90	-	1.20	271.10
I	-	-	20.20	20.20
J	8.30	-	13.16	21.46
K	-	-	112.96	112.96
L	24.20	33.43	73.86	131.49
M	-	137.30	60.16	197.46
N	33.80	-	2.30	36.10
Total	**1629.37**	**1693.73**	**497.05**	3820.15

15.6 Planning Norms

Basic objective of preparing development plan for an area is to provide adequate community facilities for that area. These facilities are provided at various levels i.e. neighborhood level, city level and regional level for the present and the projected population. The space standards of each facility are based on the hierarchy of the amenity and the size of population to be served.

There are several sets of planning standards for providing various amenities adopted by different authorities. Based on the critical examination of planning standards adopted by CIDCO, MCGB, TMC, AKBSNA and the local considerations the following planning standards are adopted for the Bhiwandi Surrounding Notified Area.

15.6.1 Open Spaces

The standards of Government of Maharashtra for providing open spaces have been adopted reproduced as under:

i). Reservation of land for the purposes of playgrounds and gardens should be made at the rate of 0.4 and 0.2 hectare per 1000 population respectively of the total population of the town and such reservations should be so distributed that they are located as far as possible within a distance of 0.80 km. to 1.20 km. from the farthest residential population in a neighborhood unit;

ii) Within a Gaothan, provision of open space should be made at the rate of 0.1 ha. per 1000 population of the projected population for the Gaothan area in the form of air lungs and tot lots. This should be in addition to the reservations made under (i) above.

ii) To encourage positive use of open spaces reserved in residential layouts, buildings for recreational purposes may be permitted to the extent of not more than $1/10^{th}$ of the total area of such reservation. K.G. Schools may also be permitted in such open spaces.

15.6.2 Schools

15.6.2.1 Primary School

The provision of primary schools is required for 15% of total population and the number of units will be worked out for 400-500 students per school. The space requirements will be worked out at the rate of 8 sq. m. per pupil out this 5 sq. m. per pupil for the building and 3 sq. m. per pupil for play ground.

15.6.2.2 Secondary School

The provision of secondary schools is required for 7.5% of total population and the number of units will be worked out for 700-1000 students per school. The space requirements will be

worked out at the rate of 15 sq. m. per pupil out this 4 sq. m. per pupil for the building and 11sqm per pupil for play ground.

15.6.3 Health & Medical facilities

Reservation of a plot for dispensary and maternity home should be made at the rate of 0.25 ha. per 10,000 population.

15.6.4 Vegetable Market

Reservation of a plot for vegetable market should be made at the rate of 0.2 ha. per 10,000 population.

15.6.5 Library

Neighborhood library site should be provided at the rate of 0.05 ha. for a population of 10,000.

15.6.6 Town Hall

Site for town hall should be reserved as far as possible not less than 0.5 ha.

15.6.7 Police Station

A police station site of 0.5 hectare for a population of 1 lakh has been reserved (CIDCO-VVNA)

15.6.8 Post office and Telegraph

A Post office and telegraph site of 0.2 hectare for a population 1 lakh (CIDCO-VVNA).

15.6.9 Fire Station

The provision for Fire station of 0.8 hectare depending on the radius (1-5 km) (CIDCO-VVNA)

15.6.10 Community Centre (Culture)

The provision of Community centre 0.15 hectare for a population 50,000 (CIDCO-VVNA)

15.6.11. Transport

i. The provision of bus stands of 0.2 hectare depending upon the need of particular area. (CIDCO-VVNA);

ii. The sites for truck terminals-each of 5 hectares. (CIDCO-VVNA)

15.6.12. Parking

Provision for parking of vehicles should be made in vicinity of railway stations, Bus Terminals, cinema theatres, markets, convenience shopping centers and other traffic generators, group housing as per norms of the National Building Code as amended from time to time.

15.6.13 Depending upon the need, adequate sites provided for purposes as follows:

i). Burial & Cremation grounds,

ii). Compost pits,

iii). Slaughter houses,

iv). Fire brigade and allied services,

v). Multipurpose halls, community centre, theatres and cinemas,

vi). Cultural centers,

These norms, as suggested by the Government of Maharashtra, are adopted in the draft Development Plan for Bhiwandi Surrounding Notified Area. Land under individual reservation is proposed according to planning standards. The authorities while implementing the proposals of the Development Plan shall assign definite/appropriate purpose from the above broad categories listed in the D. C. Regulations, considering the need and financial capacity. Further, authorities can encourage the participation of private sector for the implementation.

15.7 Proposed Social facilities (Reservations)

Adequate social facilities like educational, health, recreational, cultural etc. are envisaged to promote healthy social life of the society. Section 22 of Maharashtra Regional and Town planning (MR and TP) Act, 1966 provides for designation of sites in the Development Plan for public purposes. These include sites for schools, colleges and other educational institutions, medical and public health institutions, markets, social welfare and cultural institutions, theaters and places of public entertainment or public assembly, museums, art galleries, Govt. and other public buildings etc. and designation of sites for open spaces, play-grounds, stadium, zoological gardens, green belts, natural reserve sanctuaries and dairies. Proposals for designation of sites for various Government departments contemplating developmental activities can be given.

Having analyzed the existing level of social infrastructure such as educational, medical, recreational etc. it is observed that BSNA lacks adequate social facilities in terms of quality and quantity. Therefore, the Development Plan attempts to meet the existing deficiencies and to provide for new facilities for future population. Care taken was to provide all social facilities within accessible distance by evenly distributing *(Tables 15.12 and 15.13).*

To give effect to the implementation of Development Plan proposals, separately, a set of Development Control Regulations have been drafted and annexed to the Draft Development Plan. The Development Control Regulations as approved by the Government of Maharashtra shall govern the building permissions, other permissions and the manner in which the development to be carried within BSNA.

The broad strategies proposed for development and implementation of social infrastructure are as follows:

i) The existing facilities should continue irrespective of their meeting required planning standards.

iii) Facilities provided would take care of the needs of projected population upto the year 2028.

iv) Care has been taken to reserve feasible, generally open and locationally suitable sites for such facilities as far as possible, in order to make implementation easier.

v) In the DC Regulations, provisions have been made to pool the areas for public purpose from the land newly brought under development.

15.8 Proposed Reservations for the year-2028

Table 15.12: Sector-wise Proposed Reservation sites for BSNA

Sector	PS	SS	C	CC	FS	PST	D/MH	Lib	TH	PO	H	C/B	EL	TE	Art Complex	Admin	SC	VM	FM	G	PG	LB	STP	WW
A	12	8	1	2	2	2	6	2	2	1	2	-	-	-	-	-	3	2	-	8	13	1	-	-
B	16	13	1	4	2	2	10	2	2	1	3	-	1	-	-	-	5	5	-	6	16		-	-
C	5	3	-	1	2	-	8	1	-	-	-	-	-	-	-	-	-	-	-	5	9	4	-	-
D	8	6	-	1	2	1	6	1	1	1	2	1	-	-	-	-	2	3	1	3	10		1	-
E	7	7	-	1	-	1	7	1	2	1		-	-	-	-	-	3	3	-	5	7	2	-	1
F	9	8	1	1	1	3	7	1	1	2	2	-	-	-	-	-	2	1	-	6	8	3	-	1
G	5	3	-	-	1	-	4	-	-	1	1	1	1	-	-	-	-	-	-	7	6	1	-	1
H	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	1
I	18	13	1	2	3	2	11	2	1	2	1	-	-	-	-	-	2	3	1	9	12	1	1	-
J	11	7		2	1	1	7	1	-	1	1	1	-	-	-	-	1	2	1	7	9	1	-	-
K	78	7	1	1	1	1	4	1	1	1	1	1	-	1	-	-	3	1	-	2	5	5	-	-
L	8	6		3	3	1	8	-	-	1	-	-	-	-	-	-	1	1	-	3	5	5	-	-
M	2	1		1	-	-	4	-	-	1	-	1	-	-	-	-	-	-	-		1	3	1	-
N	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2	1	1		1
Total	**179**	**82**	**5**	**19**	**19**	**14**	**83**	**12**	**10**	**13**	**13**	**5**	**2**	**1**	**1**	**1**	**22**	**21**	**3**	**65**	**103**	**28**	**3**	**5**

Table 15.13: Proposed Reservations with Survey Numbers (Land Costs as per Ready Reckoner- 2011

Site No.	Sector	Sub-Sector	*Village Name*	*Amenity*	*Area in (Ha.)*	*Land Details*	Land cost (Acquisition Rs. Lakh)	Land ownership	Appropriate Authority
Sector - A									
1	A	A-1	*Kevani*	*Primary School*	*0.5*	*18pt, 21pt, 22pt,132pt*	*7.44*	Private & Govt. land S. No. 18pt	Planning Authority/State Education Department
2	A	A-1	*Kevani*	*Fire Station*	*0.8*	*63pt, 67pt, 72pt, 73pt*	*7.44*	Private Land	Planning Authority/Local Authority
3	A	A-1	*Kevani*	*Police Station*	*0.7*	*61pt,63pt, 72pt, 73pt, 74pt*	*7.44*	Private Land	Police Department
4	A	A-1	*Kevani*	*Play Ground*	*0.8*	*35pt, 36pt*	*7.44*	Private Land	Planning Authority/Local Authority
5	A	A-2	*Kevani*	*Primary School*	*0.5*	*36pt, 37pt, 38pt*	*7.44*	Private Land	Planning Authority/State Education Department
6	A	A-2	*Kevani*	*Secondary School*	*1.5*	*32pt,35pt, 36pt, 37pt, 38pt,*	*7.44*	Private Land	Planning Authority/State Education Department
7	A	A-3	*Rahanal*	*Playground*	*1.0*	*93pt ,95pt, 99pt ,176pt,*	12.30	Private Land	Planning Authority/Local Authority
8	A	A-3	*Rahanal*	*Shopping Complex*	*1.1*	*95pt, 97pt, 98pt, 99pt, 176pt*	12.30	Private Land	Local Authority

9	A	A-4	*Rahanal*	*Secondary School*	*1.1*	*86pt, 87pt. 88pt, 89pt, 104pt*	12.30	Private Land	Planning Authority/State Education Department
10	A	A-4	*Rahanal*	*Community Centre*	*0.2*	*119pt*	12.30	Private Land	Local Authority
11	A	A-4	*Rahanal*	*Post Office*	*0.2*	*87pt, 89pt, 104pt*	12.30	Private Land	Postal Department
12	A	A-4	*Rahanal*	*Hospital*	*0.5*	*119pt*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
13	A	A-4	*Rahanal*	*Playground*	*0.4*	*86pt, 88pt, 89pt, 104pt*	12.30	Private Land	Planning Authority/Local Authority
14	A	A-5	*Rahanal*	*Primary School*	*0.5*	*15pt, 78pt, 93pt,94pt,95pt*	12.30	Private Land	Planning Authority/State Education Department
15	A	A-5	*Rahanal*	*Secondary School*	*1.5*	*78pt, 80pt, 93pt, 94pt, 95pt,100pt ,Xpt,*	12.30	Private Land	Planning Authority/State Education Department
16	A	A-5	*Rahanal*	*Dispensary / Maternity Home*	*0.2*	*15pt, 78pt*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
17	A	A-5	*Rahanal*	*Library*	*0.5*	*53pt, 54pt*	12.30	Private Land	Local Authority
18	A	A-6	*Rahanal*	*Town Hall*	*0.3*	*53pt*	12.30	Private Land	Local Authority
19	A	A-6	*Rahanal*	*Play Ground*	*0.4*	*52pt*	12.30	Private Land	Planning Authority/Local Authority
20	A	A-7	*Rahanal*	*Dispensary / Maternity Home*	*0.3*	*50pt*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
21	A	A-7	*Rahanal/ Kevani*	*Play Ground*	*1.1*	*Kevani 19pt,Xpt, Rahanal 34pt*	12.30	Private Land	Planning Authority/Local Authority
22	A	A-8	*Rahanal*	*Primary School*	*0.5*	*47pt, 48pt, 49pt*	12.30	Private Land	Planning Authority/State Education Department
23	A	A-8	*Rahanal*	*Secondary School*	*1*	*48pt, 49pt, 50pt, 191pt, Xpt*	12.30	Private & Govt. land S. No. 191pt,	Planning Authority/State Education Department
24	A	A-8	*Rahanal*	*Playground*	*0.5*	*49pt, 52pt, 54pt,Xpt*	12.30	Private Land	Planning Authority/Local Authority
25	A	A-8	*Rahanal*	*Playground*	*0.4*	*73pt, 75pt*	12.30	Private Land	Planning Authority/Local Authority
26	A	A-9	*Rahanal*	*Primary School*	*0.5*	*85pt, 86pt, 89pt*	12.30	Private Land	Planning Authority/State Education Department
27	A	A-11	*Dunge*	*Secondary School*	*1.1*	*35pt, 36pt, 37pt*	3.22	Private Land	Planning Authority/State Education Department
28	A	A-11	*Dunge*	*Primary School*	*0.5*	*40pt, 113A-1-A-1*	3.22	Private Land	Planning Authority/State Education Department
29	A	A-11	*Dunge*	*Playground*	*0.4*	*36pt, 37pt*	3.22	Private Land	Planning Authority/Local Authority
30	A	A-12	*Rahanal*	*Primary School*	*0.5*	*66pt*	12.30	Private Land	Planning Authority/State Education Department
31	A	A-13	*Rahanal*	*Dispensary / Maternity Home*	*0.2*	*66pt, 67pt*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
32	A	A-13	*Kalwar*	*Town Hall*	*0.2*	*121pt, 122pt*	7.74	Private Land	Local Authority
33	A	A-13	*Kalwar*	*Play Ground*	*0.4*	*103pt, 104pt, 105pt, 107pt, 133pt,140pt*	7.74	Private Land	Planning Authority/Local Authority
34	A	A-14	*Kalwar*	*Primary School*	*0.5*	*107pt, 118pt 119pt*	7.74	Private Land	Planning Authority/State Education Department
35	A	A-14	*Kalwar*	*Community Centre*	*0.2*	*105pt, 107pt,133pt*	7.74	Private Land	Local Authority
36	A	A-14	*Kalwar*	*Dispensary / Maternity Home*	*0.2*	*122pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
37	A	A-14	*Kalwar*	*Lake Beautification*	*0.3*	*Xpt*	---	----	------

38	A	A15	*Dunge /Kalwar*	*Secondary School*	*1.2*	*Dunge 30pt, 31pt, Kalwar 129pt*	7.74	Private Land	Planning Authority/State Education Department
39	A	A-16	*Dunge*	*Primary school*	*0.5*	*32pt, 34pt, 35pt*	3.22	Private Land	Planning Authority/State Education Department
40	A	A-16	*Dunge*	*Garden*	*0.4*	*61pt, 62pt*	3.22	Private Land	Planning Authority/Local Authority
41	A	A-16	*Dunge*	*Dispensary / Maternity Home*	*0.2*	*35pt, 36pt, 113A-1-A-1pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
42	A	A-17	*Dunge*	*Garden*	*0.4*	*42pt*	3.22	Private Land	Planning Authority/Local Authority
43	A	A-17	*Dunge*	*Bus stand*	*0.2*	*69pt,113A-1-A-1 pt*	3.22	Private Land	State Transport Department/Planning Authority/Local Authority
44	A	A-17	*Rahanal*	*Vegetable Market*	*1.1*	*36pt, 37pt,38pt 50pt,Xpt*	12.30	Private Land	Local Authority
45	A	A17	*Rahanal*	*Shopping Complex*	*1.1*	*37pt, 38pt, Xpt*	12.30	Private Land	Local Authority
46	A	A-18	*Dunge*	*Fire Station*	*0.63*	*69pt, 70pt*	3.22	Private Land	Planning Authority/Local Authority
47	A	A-18	*Dunge*	*Police Station*	*0.6*	*69pt, 70pt*	3.22	Private Land	Police Department
48	A	A-19	*Dunge*	*Primary School*	0.52	*55pt, 56pt, 57pt, 113A-1-A-1pt*	3.22	Private Land	Planning Authority/State Education Department
49	A	A-19	*Dunge*	*Garden*	*0.4*	*107pt*	3.22	Private Land	Planning Authority/Local Authority
50	A	A-19	*Dunge*	*Playground*	*0.7*	*19pt, 20pt, 113A-1-A-1pt*	3.22	Private Land	Planning Authority/Local Authority
51	A	A-19	*Dunge*	*Primary School*	*0.5*	*11pt, 12pt, 13pt*	3.22	Private Land	Planning Authority/State Education Department
52	A	A-19	*Dunge*	*Secondary School*	1.2	*18pt, 19pt, 20pt,55pt,113A-1-A-1 pt*	3.22	Private Land	Planning Authority/State Education Department
53	A	A-19	*Dunge*	*College*	*3.2*	*24pt, 52pt, 53pt, 60pt,113A-1-A-1pt*	3.22	Private Land	Planning Authority/State Education Department
54	A	A-19	*Dunge*	*Dispensary / Maternity Home*	*0.3*	*11pt, 13pt, 119pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
55	A	A-19	*Dunge*	*Hospital*	*3.0*	*54pt, 55pt, 57pt, 58pt,59pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
56	A	A-20	*Dunge*	*Library*	*0.5*	*20pt, 21pt, 22pt*	3.22	Private Land	Local Authority
57	A	A-20	*Dunge*	*Shopping Complex*	*2*	*21pt, 22pt, 23pt*	3.22	Private Land	Local Authority
58	A	A-20	*Dunge/ Kalwar/ Vadghar*	*Vegetable Market*	*2.1*	*Dunge 21pt,22pt,23pt,25pt,27pt,116pt, Kalwar7pt,8pt,Vadghar 20pt,35pt, 44pt*	7.74	Private Land	Local Authority
59	A	A-22	*Kalwar/ Dunge*	*Primary School*	*0.6*	*Kalwar 6pt, 9pt Dunge 27pt*	7.74	Private & Govt. land S. No. 9pt,	Planning Authority/State Education Department
60	A	A-22	*Dunge / Kalwar*	*Secondary School*	*1.0*	*Dunge 27pt,116pt, Kalwar 7pt,8pt,9pt*	7.74	Private & Govt. land S. No. 9pt,	Planning Authority/State Education Department
61	A	A-22	*Kalwar*	*Playground*	*0.5*	*6pt, 9pt, 137pt,*	7.74	Private & Govt. land S. No. 9pt, 137pt,	Planning Authority/Local Authority
62	A	A-23	*Rahanal*	*Garden*	*1.3*	*87pt,103pt,*	12.30	Private Land	Planning Authority/Local

						104pt,116pt ,119pt,			Authority
63	A	A-23	*Rahanal*	*Play Ground*	*3.0*	*112pt,114pt ,115,116pt, 119pt,120pt .Xpt*	12.30	Private Land	Planning Authority/Local Authority
64	A	A-20	*Vadghar*	*Playground*	*3.2*	*12pt,13pt,2 1pt,22pt,24 pt,35pt*	3.22	Private Land	Planning Authority/Local Authority
65	A	A-6	*Kevani*	*Garden*	*0.3*	*18pt, 24pt*	12.30	Private Land	Planning Authority/Local Authority
66	A	A-6	*Rahanal*	*Garden*	*0.32*	*32pt*	12.30	Private Land	Planning Authority/Local Authority
67	A	A-23	*Dunge/ Vadunav ghar*	*Garden*	*2.8*	*Dunge 3pt,4pt,5Ppt ,11pt,119pt Vadunavgh ar 19Ppt,302P pt304pt,305 Pp,tXpt,*	3.22	Private Land	Planning Authority/Local Authority
68	A	A-23	*Kalwar*	*Garden*	*3.0*	*12P,45pt,46 pt,49pt,72P pt,79pt,82pt ,83P,,88pt, 89pt,139pt, 8pt.*	7.74	Private Land	Planning Authority/Local Authority
Sector - B									
1	B	B-1	*Kalwar*	*Hospital*	*0.8*	*130pt*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
2	B	B-3	*Kalwar*	*Fire Station*	*0.5*	*43pt*	7.74	Govt. Land	Planning Authority/Local Authority
3	B	B-3	*Vadghar*	*Playground*	*1.3*	*23Bpt, 25pt,32Ppt, 33Apt ,*	3.22	Private Land	Planning Authority/Local Authority
4	B	B-4	*Karivali*	*Secondary School*	*1.1*	*127pt, 132pt, 133pt, 134pt,*	7.74	Private Land	Planning Authority/State Education Department
5	B	B-4	*Vadunav ghar*	*Secondary School*	*1.5*	*100pt, 191pt, 192pt, 194pt,195pt*	3.22	Private Land	Planning Authority/State Education Department
6	B	B-4	*Kalwar*	*Secondary School*	*1.45*	*18pt, 19pt, 32pt,33pt, 35pt*	7.74	Private Land	Planning Authority/State Education Department
7	B	B-4	*Karivali*	*Primary School*	*0.6*	*132pt,133pt*	7.74	Private Land	Planning Authority/State Education Department
8	B	B-4	*Vadunav ghar*	*Primary school*	*0.7*	*100pt, 191pt*	3.22	Private Land	Planning Authority/State Education Department
9	B	B-4	*Kalwar*	*Primary School*	*1.0*	*30pt, 32pt, 33pt*	7.74	Private Land	Planning Authority/State Education Department
10	B	B-4	*Karivali*	*Dispensary / Maternity Home*	*0.5*	*132pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
11	B	B-4	*Karivali/V adunavg har*	*Garden*	*13.21*	*Karivali, 114pt., 115pt,190pt Vadunavgh ar 175pt,176pt ,177pt,178p t,179pt,200 pt,201pt,20 2pt,203pt,2 04pt,284Apt ,284Bpt,284 Cpt,Xpt,*	7.74	Private & Govt. land S. No. 113. 190pt,	Planning Authority/Local Authority
12	B	B-4	*Kalwar/*	*Lake*	*0.9*	*Kalwar*	7.74	Private & Govt.	Planning Authority/Local

			Vadunavghar	*Beautification*		*20pt, 21pt,32pt, Xpt., Vadunavghar 218pt,219pt ,220pt*		land S. No. 219pt,	Authority
13	B	B-4	Kalwar	*Playground*	*0.7*	*21pt, 30pt, 32pt*	7.74	Private Land	Planning Authority/Local Authority
14	B	B-4	*Karivali*	*Vegetable Market*	*0.4*	*103pt, 104pt, 133pt,134pt*	7.74	Private Land	Local Authority
15	B	B-4	*Karivali*	*Shopping Complex*	*0.4*	*132pt,133pt , 134pt, 138pt*	7.74	Private Land	Local Authority
16	B	B-5	*Vadghar*	*Dispensary / Maternity Home*	*0.2*	*30pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
17	B	B-6	*Vadunavghar*	*Dispensary / Maternity Home*	*0.3*	*12pt,*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
18	B	B-7	*Vadunavghar*	*Primary School*	*0.5*	*4pt, 5pt*	3.22	Private Land	Planning Authority/State Education Department
19	B	B-7	*Vadunavghar*	*Secondary School*	*1.1*	*244pt*	3.22	Private Land	Planning Authority/State Education Department
20	B	B-7	*Vadunavghar*	*Community Centre*	*0.2*	*3pt, 4pt*	3.22	Private Land	Local Authority
21	B	B-7	*Vadunavghar*	*Police Station*	*0.2*	*114pt*	3.22	Private Land	Police Department
22	B	B-7	*Vadunavghar*	*Lake Beautification*	*0.5*	*5pt, 6pt, 114pt*	3.22	Private Land	Planning Authority/Local Authority
23	B	B-7	*Vadunavghar*	*Dispensary / Maternity Home*	*0.2*	*3pt,4pt, 5pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
24	B	B-7	*Vadunavghar*	*Library*	*0.4*	*143pt, 244pt*	3.22	Private Land	Local Authority
25	B	B-8	*Vadunavghar*	*Secondary School*	*1.5*	*147pt, 148pt, 151pt*	3.22	Private & Govt. Land S. No. 147pt, 148pt,	Planning Authority/State Education Department
26	B	B-8	*Vadunavghar*	*Playground*	*0.4*	*146pt, 148pt*	3.22	Private & Govt. Land S. No. 148pt,	Planning Authority/Local Authority
27	B	B-9	*Vadunavghar*	*Primary School*	*0.6*	*148pt*	3.22	Govt. Land	Planning Authority/State Education Department
28	B	B-9	*Vadunavghar*	*Shopping Complex*	*1.0*	*140pt,148pt ,151pt*	3.22	Private Land	Local Authority
29	B	B-9	*Vadunavghar*	*Vegetable Market*	*1*	*150pt, 151pt 163pt, 164pt, 187pt,*	3.22	Private Land	Local Authority
30	B	B-10	*Vadunavghar*	*Primary School*	*0.4*	*163pt, 164pt,165pt ,186pt*	3.22	Private Land	Planning Authority/State Education Department
31	B	B-10	*Vadunavghar*	*Garden*	*0.4*	*163pt, 164pt*	3.22	Private Land	Planning Authority/Local Authority
32	B	B-10	*Vadunavghar*	*Garden*	*2.4*	*169pt,170pt ,171pt,172, 173pt,174pt ,175pt,284 D,284Cpt*	3.22	Private Land	Planning Authority/Local Authority
33	B	B-11	*Junandurkhi*	*Primary School*	*0.6*	*164pt, 168pt, 171pt,172pt*	2.21	Private Land	Planning Authority/State Education Department
34	B	B-11	*Kambe*	*Secondary School*	*1.1*	*70pt, 71pt, 72pt, 180pt*	9.19	Private Land	Planning Authority/State Education Department
35	B	B-11	*Junandurkhi*	*Post Office*	*0.2*	*164pt, 277pt*	2.21	Private Land	Postal Department
36	B	B-11	*Junandurkhi/ Kambe*	*Garden*	*4.7*	*Kambe 71pt,72pt,180pt,181pt,*	9.19	Private land	Planning Authority/Local Authority

						Junandurkhi 75pt,172pt, 173pt,174pt ,178pt,179pt,180pt, 182pt., 210pt,227			
37	B	B-12	*Kambe*	*Town Hall*	*0.5*	*66pt, 67pt, 76pt, 193pt*	9.19	Private Land	Local Authority
38	B	B-12	*Kambe*	*Shopping Complex*	*2.2*	*67pt, 73pt,75pt, 76pt,77pt,180pt*	9.19	Private Land	Local Authority
39	B	B-12	*Kambe/ Junandurkhi*	*Vegetable Market*	*1.6*	*Kambe 72pt,73pt, 74pt, 75pt,180pt Junandurkhi 166pt,*	9.19	Private Land	Local Authority
40	B	B-13	*Kambe*	*Primary school*	*0.6*	*63pt, 70pt, 180pt*	9.19	Private Land	Planning Authority/State Education Department
41	B	B-13	*Kambe*	*Dispensary / Maternity Home*	*0.5*	*63pt,71pt, 180pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
42	B	B-13	*Kambe/ Katai*	*Garden*	*7.42*	*Kambe,35pt , 36pt,Xpt ,Katai,105pt ,106pt,108pt,109pt,110 111pt,112pt ,113pt,114pt,131pt, Xpt*	9.19	Private & Govt. Land S. No. 105pt,	Planning Authority/Local Authority
43	B	B-14	*Kambe*	*Primary School*	*0.5*	*36pt*	9.19	Private Land	Planning Authority/State Education Department
44	B	B-15	*Kambe*	*Community Centre*	*0.2*	*42pt*	9.19	Private Land	Local Authority
45	B	B-14	*Kambe*	*Dispensary / Maternity Home*	*0.2*	*36pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
46	B	B-14	Kambe	Play Ground	*6.9*	20pt,21pt, 23pt,27pt,28,29,30pt,31pt,32pt,33, 34pt,119pt, 178pt,195pt	9.19	Private Land	Planning Authority/Local Authority
47	B	B-15	*Kambe*	*Primary School*	*0.6*	*40pt, 44pt, 45pt, 46pt*	9.19	Private Land	Planning Authority/State Education Department
48	B	B-15	*Kambe*	*Secondary School*	*1.4*	*44pt,45pt, 46pt, 47pt, 48pt, 76pt*	9.19	Private Land	Planning Authority/State Education Department
49	B	B-15	*Kambe*	*Hospital*	*0.8*	*39pt, 40pt, 44pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
50	B	-do-	*Kambe*	*College*	*3.8*	*43pt, 44pt, 45pt, 76pt, 77pt,186pt*	9.19	Private Land	Planning Authority/State Education Department
51	B	B-15	*Kambe*	*Playground*	*1.2*	*39pt, 40pt, 43pt, 44pt, 192pt,*	9.19	Private Land	Planning Authority/Local Authority
52	B	B-15	*Kambe*	*Lake Beautification*	*1.1*	*42pt, 98pt, 127pt, 201pt*	9.19	Private & Govt. Land S. No. 127pt,	Planning Authority/Local Authority
53	B	B-16	*Kambe*	*Primary School*	*0.6*	*74pt, 75pt, 78pt, 182pt,*	9.19	Private Land	Planning Authority/State Education Department
54	B	B-16	*Kambe*	*Playground*	*0.4*	*74pt, 78pt, 81pt,182pt, 183pt*	9.19	Private Land	Planning Authority/Local Authority
55	B	B-17	*Kambe*	*Secondary School*	*1.0*	*74pt, 81pt, 182pt*	9.19	Private Land	Planning Authority/State Education Department
56	B	B-10	Vadunav	Playground	3.1	155pt,156pt	3.22	Private Land	Planning Authority/State

			ghar			,157pt,158pt,159,257pt, 284Cpt,285pt			Education Department
57	B	B-18	*Kambe*	*Electricity Sub - Station*	*5.4*	*94pt, 95pt, 170pt, 171pt,xpt.*	9.19	Private Land	State Electricity Board
58	B	B-18	Kambe	Playground	0.4	102pt,103pt ,104pt	9.19	Private Land	Planning Authority/State Education Department
59	B	B-20	*Kambe*	*Dispensary / Maternity Home*	*0.3*	*2pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
60	B	B-20	*Kambe*	*Lake Beautification*	*4.8*	*1pt, 2pt, 3pt,5pt,25pt ,26pt, 142pt*	9.19	Private Land	Planning Authority/Local Authority
61	B	B-21	*Kambe*	*Secondary School*	*1.1*	*2pt, 3pt, 159pt, 167pt*	9.19	Private Land	Planning Authority/State Education Department
62	B	B-21	*Kambe*	*Playground*	*0.4*	*3pt, 159pt*	9.19	Private Land	Planning Authority/Local Authority
63	B	B-21	*Kambe*	*Vegetable Market*	*1.9*	*159pt, 160pt, 161pt, 164pt, 165pt*	9.19	Private Land	Local Authority
64	B	B-22	*Kambe*	*Primary School*	*0.6*	*2pt, 167pt,*	9.19	Private Land	Planning Authority/State Education Department
65	B	B-22	*Kambe*	*Community Centre*	*0.2*	*2pt, 167pt, 168pt*	9.19	Private Land	Local Authority
66	B	B-22	*Kambe*	*Shopping Complex*	*3.6*	*155pt,164pt , 165pt, 166pt*	9.19	Private Land	Local Authority
67	B	B-24	*Kambe*	*Dispensary / Maternity Home*	*0.2*	*162pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
68	B	B-25	*Kambe*	*Primary School*	*0.6*	*147pt, 156pt, 157pt,159pt*	9.19	Private Land	Planning Authority/State Education Department
69	B	B-25	*Kambe*	*Secondary School*	*1*	*157pt, 159pt*	9.19	Private Land	Planning Authority/State Education Department
70	B	B-25	*Kambe*	*Playground*	*0.4*	*147pt ,156pt*	9.19	Private Land	Planning Authority/Local Authority
71	B	B-26	*Kambe / Junandurkhi*	*Primary School*	*0.6*	*Kambe 111pt, Junandurkhi 95pt*	9.19	Private & Govt. Land S. No. 95pt,	Planning Authority/State Education Department
72	B	B-26	*Kambe*	*Secondary School*	*1.2*	*107pt, 133pt*	9.19	Private & Govt. Land S. No. 133pt,	Planning Authority/State Education Department
73	B	B-26	*Junandurkhi*	*Dispensary / Maternity Home*	*0.3*	*216pt*	2.21	Private Land	State Health Department/Planning Authority/Local Authority
74	B	B-26	*Kambe*	*Fire Station*	*0.5*	*83pt, 84pt, ,198pt*	9.19	Private Land	Planning Authority/Local Authority
75	B	B-26	*Kambe*	*Police Station*	*0.3*	*87pt, 172pt*	9.19	Private Land	Police Department
76	B	B-26	*Kambe*	*Playground*	*0.6*	*140pt, 145pt, 146pt,147pt*	9.19	Private Land	Planning Authority/Local Authority
77	B	B-26	Katai	*Dispensary / Maternity Home*	0.2	*35pt, 40pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
78	B	B-29	*Kambe*	*Library*	*0.3*	*147pt,*	9.19	Private Land	Local Authority
79	B	B-29	*Kambe*	*Hospital*	*0.8*	*147pt, 150pt*	9.19	Private Land	State Health Department/Planning Authority/Local Authority
80	B	B-30	*Kambe*	*Primary School*	*0.5*	*142pt,143pt , 144pt, 145pt*	9.19	Private Land	Planning Authority/State Education Department
81	B	B-30	*Kambe*	*Secondary School*	*1.1*	*142pt,143pt ,144pt, 145pt,*	9.19	Private Land	Planning Authority/State Education Department

						147pt			
82	B	B-30	Kambe	Playground	0.5	142pt,143pt ,144pt	/9.19	Private Land	Planning Authority/Local Authority
83	B	B-30	Katai	Vegetable Market	1.1	35pt,37pt, 40pt, 42pt, 119pt	9.19	Private Land	Local Authority
84	B	B-30	Katai	Shopping Complex	0.9	35pt, 40pt,45pt, 118pt,119pt ,	9.19	Private Land	Local Authority
85	B	B-31	Katai	Primary School	0.5	45pt,118pt	9.19	Private Land	Planning Authority/State Education Department
86	B	B-31	Katai	Secondary School	1	70pt, 71pt, 72pt, 74pt	9.19	Private Land	Planning Authority/State Education Department
87	B	B-31	Katai	Town Hall	0.5	45pt,	9.19	Private Land	Local Authority
88	B	B-31	Katai	Playground	0.4	42pt, 45pt	9.19	Private Land	Planning Authority/Local Authority
89	B	B-32	Katai	Community Centre	0.2	118pt	9.19	Private Land	Local Authority
90	B	B-32	Katai	Play Ground	2.3	70pt,71pt, 72pt, 73pt	9.19	Private Land	Planning Authority/Local Authority
91	B	B-29	Shelar	Garden	1.7	29pt, 57pt	9.60	Private Land	Planning Authority/Local Authority
92	B	B-4	Karivali	Play Ground	11.45	85pt,93pt,94pt,95pt,96, 97,98pt,99pt,101pt,102 pt,103pt,105pt,106pt,107pt,110pt, 113,114pt,115pt,190pt, 100pt., Xpt	7.44	Private Land	Planning Authority/Local Authority
93	B	B-13	Kambe	Play Ground	3.5	57pt,58pt,59pt,71pt,180pt,Xpt	9.19	Private Land	Planning Authority/Local Authority
94	B	B-13	Katai/ Kambe	Play Ground	11.37	Katai 112pt, 113pt,114pt ,131pt, Kambe 19pt,20pt,31pt,32pt,34 pt,Xpt,	9.19	Private Land	Planning Authority/Local Authority
Sector - C									
1	C	C-3	Kalwar	Primary School	0.6	97pt, 131pt,	7.44	Private & Govt. Land S. No. 131pt,	Planning Authority/State Education Department
2	C	C-3	Karivali	Primary School	0.6	58pt	7.44	Govt. Land	Planning Authority/State Education Department
3	C	C-3	Karivali	Secondary School	1.0	58pt	7.44	Govt. Land	Planning Authority/State Education Department
4	C	C-3	Kalwar	Secondary School	1.2	97pt, 131pt	7.44	Private & Govt. Land S. No. 131pt,	Planning Authority/State Education Department
5	C	C-3	Rahanal/ Kalwar	Dispensary / Maternity Home	0.5	Rahanal 87pt, Kalwar 97pt,131pt	12.30	Private & Govt. Land S. No. 131pt,	State Health Department/Planning Authority/Local Authority
6	C	C-3	Kalwar	Playground	1.7	131pt,	7.44	Govt. Land	Planning Authority/Local Authority
7	C	C-2	Rahanal	Play Ground	0.4	130pt , 156 pt, 157Apt, 158 pt	12.30	Private & Govt. Land S. No. 130pt,	Planning Authority/Local Authority
8	C	C-3	Kalwar	Garden	0.2	82pt, 84pt	7.44	Private Land	Planning Authority/Local Authority
9	C	C-3	Karivali	Playground	0.4	58pt	7.44	Govt. Land	Planning Authority/Local Authority
10	C	C-3	Kalwar	Library	0.6	131pt	7.44	Govt. Land	Local Authority
11	C	C-3	Karivali	Dispensary / Maternity	0.3	58pt	7.44	Govt. Land	State Health Department/Planning

				Home					Authority/Local Authority
12	C	C-5	*Karivali*	*Garden*	*0.4*	*51pt*	7.44	Private Land	Planning Authority/Local Authority
13	C	C-7	*Karivali*	*Dispensary / Maternity Home*	*0.2*	*164pt*	7.44	Govt. Land	State Health Department/Planning Authority/Local Authority
14	C	C-7	*Karivali*	*Garden*	*0.3*	*164pt,169pt*	7.44	Private & Govt. Land S. No. 172pt,	Planning Authority/Local Authority
15	C	C-8	Katai	*Garden*	*3.3*	*131pt*	9.19	131pt Govt. Land	Planning Authority/Local Authority
16	C	C-10	*Katai*	*Fire Station*	*0.5*	*11pt, 13pt*	9.19	Private & Govt. Land S. No. 32pt,	Planning Authority/Local Authority
17	C	C-10	*Katai*	*Dispensary / Maternity Home*	*0.5*	*11pt, 13pt, 14pt,87pt*	9.19	Private & Govt. Land S. No. 13pt,32pt,	State Health Department/Planning Authority/Local Authority
18	C	C-10	*Katai*	*Play Ground*	*1.0*	*11pt, 13pt, 14pt*	9.19	Private & Govt. Land S. No. 13pt,	Planning Authority/Local Authority
19	C	C-12	*Kambe*	*Lake Beautification*	*1.0*	*22pt, 23pt,128pt*	9.19	Private & Govt. Land S. No. 128pt,	Planning Authority/Local Authority
20	C	C-14	*Dahyale*	*Primary School*	*0.5*	*6pt, 8pt, 9pt*	2.67	Private Land	Planning Authority/State Education Department
21	C	C-14	*Dahyale*	*Play Ground*	*0.4*	*10pt, 13pt, 21pt*	2.67	Private Land	Planning Authority/Local Authority
22	C	C-15	*Khoni*	*Dispensary / Maternity Home*	*0.2*	*44pt, 46pt*	10.12	Govt. Land	State Health Department/Planning Authority/Local Authority
23	C	C-15	*Shelar*	*Play Ground*	*0.5*	*5pt, 9pt*	9.60	Private Land	Planning Authority/Local Authority
24	C	C-16	*Khoni*	*Garden*	*0.4*	*9pt*	10.12	Private Land	Planning Authority/Local Authority
25	C	C-16	*Khoni*	*Lake Beautification*	*1.3*	*43pt,44pt*	10.12	Private & Govt. Land S. No. 44pt,	Planning Authority/Local Authority
26	C	C-17	*Shelar*	*Dispensary / Maternity Home*	*0.3*	*28pt, 29pt*	9.60	Private Land	State Health Department/Planning Authority/Local Authority
27	C	C-18	*Shelar*	*Primary School*	*1*	*23pt, 31pt, 32pt*	9.60	Private Land	Planning Authority/State Education Department
28	C	C-18	*Shelar*	*Fire Station*	*0.5*	*31pt, 32pt*	9.60	Private Land	Planning Authority/Local Authority
29	C	C-18	*Shelar*	*Playground*	*0.5*	*3pt, 23pt, 32pt*	9.60	Private Land	Planning Authority/Local Authority
30	C	C-14	*Katai*	*Lake Beautification*	*0.36*	*30pt,31pt,32pt, 33pt*	9.19	Private Land	Planning Authority/Local Authority
31	C	C-18	*Shelar*	*Dispensary / Maternity Home*	*0.2*	*7pt, 8pt, 9pt*	9.60	Private & Govt. Land S. No. 7pt	State Health Department/Planning Authority/Local Authority
32	C	C-19	*Shelar*	*Primary School*	*1.0*	*110pt, 111pt., 119pt, 120pt., Xpt.*	9.60	Private Land	Planning Authority/State Education Department
33	C	C-19	*Shelar*	*Secondary School*	*1.5*	*109pt, 110pt,111pt ,125pt*	9.60	Private Land	Planning Authority/State Education Department
34	C	C-19	*Shelar*	*Community Centre*	*0.3*	*117pt, 118pt, 119pt*	9.60	Private Land	Local Authority
35	C	C-19	*Shelar*	*Dispensary / Maternity Home*	*0.4*	*118pt, 119pt, 120pt*	9.60	Private Land	State Health Department/Planning Authority/Local Authority
36	C	C-19	*Shelar*	*Playground*	*0.4*	*109pt,125pt ,*	9.60	Private Land	Planning Authority/Local Authority
37	C	C-18	*Shelar*	*Lake Beautification*	*1.5*	*36pt,38pt*	9.60	Private Land	Planning Authority/Local Authority
38	C	C-8	*Katai*	*Play Ground*	*7.2*	*103pt,104pt ,105pt,106pt,107pt.,*	9.19	Private & Govt. Land S.No 105	Planning Authority/Local Authority

						131pt.			
Sector - D									
1	D	D-1	Bhinar	Primary School	0.5	20pt, 29pt, 98pt	3.22	Private Land	Planning Authority/State Education Department
2	D	D-1	Bhinar	Play Ground	0.5	29pt ,98pt	3.22	Private Land	Planning Authority/Local Authority
3	D	D-1	Bhinar	Garden	1.1	14pt, 16pt, 18pt 94pt, 95Ppt,96pt	3.22	Private Land	Planning Authority/Local Authority
4	D	D-2	Bhinar	Secondary School	1.1	27pt, 28pt, 29pt, 98pt	3.22	Private Land	Planning Authority/State Education Department
5	D	D-2	Bhinar	Dispensary / Maternity Home	0.2	23pt, 36pt, 37pt,88pt	3.22	Private Land	State Health Department/Planning Authority/Local Authority
6	D	D-2	Bhinar	Library	0.3	23pt, 25pt, 34,36pt	3.22	Private Land	Local Authority
7	D	D-2	Bhinar	Vegetable Market	0.5	27pt ,98pt	3.22	Private Land	Local Authority
8	D	D-3	Bhinar	Primary School	0.6	36pt, 37pt	3.22	Private Land	Planning Authority/State Education Department
9	D	D-3	Bhinar	Playground	0.5	36pt	3.22	Private Land	Planning Authority/Local Authority
10	D	D-3	Bhinar	Vegetable Market	1	3pt ,41Apt, 86Apt	3.22	Private Land	Local Authority
11	D	D-4	Bhinar	Secondary School	0.8	3pt, 40pt, 41Apt, 87pt	3.22	Private Land	Planning Authority/State Education Department
12	D	D-4	Bhinar	Playground	0.5	3pt,37pt, 88pt	3.22	Private Land	Planning Authority/Local Authority
13	D	D-5	Bhinar	Community Centre	0.2	115pt	3.22	Private Land	Local Authority
14	D	D-5	Bhinar	Dispensary / Maternity Home	0.4	2pt, 3Apt	3.22	Private Land	State Health Department/Planning Authority/Local Authority
15	D	D-5	Bhinar	Shopping Complex	0.4	2pt, 3Apt	3.22	Private Land	Local Authority
16	D	D-6	Bhinar	Primary School	0.5	49pt ,115pt	3.22	Private Land	Planning Authority/State Education Department
17	D	D-6	Bhinar	Garden	0.5	49pt,102pt, 115pt	3.22	Private Land	Planning Authority/Local Authority
18	D	D-8	Savandhe	Primary School	0.5	28pt,29pt,66pt,Xpt	6.65	Private Land	Planning Authority/State Education Department
19	D	D-8	Savandhe	Fire Station	0.2	21pt, 22pt	6.65	Private Land	Planning Authority/Local Authority
20	D	D-8	Savandhe	Dispensary / Maternity Home	0.2	22pt, 33pt	6.65	Private Land	State Health Department/Planning Authority/Local Authority
21	D	D-8	Savandhe	Playground	0.8	26pt,29pt,30pt,74pt,Xpt	6.65	Private Land	Planning Authority/Local Authority
22	D	D-10	Gorsai	Fire Station	0.5	83pt	3.22	Govt. Land	Planning Authority/Local Authority
23	D	D-10	Gorsai	Police Station	0.7	83pt	3.22	Govt. Land	Police Department
24	D	D-10	Gorsai	Hospital	1.0	69pt,83pt	3.22	Govt. Land	State Health Department/Planning Authority/Local Authority
25	D	D-10	Gorsai	Post Office	0.4	83pt	3.22	Govt. Land	Postal Department
26	D	D-10	Gorsai	Playground	0.5	5pt, 69pt, 83pt	3.22	Private & Govt. Land S. No. 69pt,	Planning Authority/Local Authority
27	D	D-11	Gorsai	Primary School	1.2	3pt, 4pt, 50pt	3.22	Private Land	Planning Authority/State Education Department
28	D	D-11	Gorsai	Secondary School	1.5	2pt, 3pt, 4pt, 48pt,50pt	3.22	Private Land	Planning Authority/State Education Department
29	D	D-11	Gorsai	Dispensary / Maternity Home	0.2	1pt,48pt	3.22	Private Land	State Health Department/Planning Authority/Local Authority
30	D	D-11	Gorsai	Playground	0.3	2pt ,3pt, 48pt,	3.22	Private Land	Planning Authority/Local Authority
31	D	D-11	Gorsai	Fish Market	1.4	9pt, 29pt, 30pt, 53pt,	3.22	Private Land	Local Authority
32	D	D-12	Bhinar/	Secondary	1.5	Bhinar	3.22	Private Land	Planning Authority/State

			Gorsai	*School*		*104A pt, 105pt, Gorsai 36pt, 61pt*			Education Department
33	D	D-12	*Gorsai/Bhinar*	*Hospital*	*0.8*	*36pt, 61pt Bhinar 104A 4Apt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
34	D	D-12	*Gorsai*	*Playground*	*0.9*	*22pt,61pt*	3.22	Private Land	Planning Authority/Local Authority
35	D	D-14	*Gorsai*	*Garden*	*1.0*	*12 pt, 55pt, 74pt, 83pt,*	3.22	Private & Govt. Land S. No. 83pt,	Planning Authority/Local Authority
36	D	D-12	*Gorsai*	*Vegetable Market*	*1.0*	*1pt, 31pt, 32pt, 43pt, 44pt*	3.22	Private Land	Local Authority
37	D	D-12	*Gorsai*	*Shopping Complex*	*1.1*	*41pt, 42pt, 43pt*	3.22	Private Land	Local Authority
38	D	D-12	*Bhinar*	*Primary School*	*1*	*60pt, 69pt, 105pt*	3.22	Private Land	Planning Authority/State Education Department
39	D	D-13	*Bhinar*	*Secondary School*	*1.1*	*75pt, 107pt,Xpt*	3.22	Private Land	Planning Authority/State Education Department
40	D	D-13	*Bhinar*	*Dispensary / Maternity Home*	*0.5*	*60pt,105pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
41	D	D-13	*Bhinar*	*Town Hall*	*0.5*	*59pt, 60pt, 105pt*	3.22	Private Land	Local Authority
42	D	D-13	*Bhinar*	*Play Ground*	*0.5*	*72pt, 74pt, 75pt, 107pt,Xpt*	3.22	Private Land	Planning Authority/Local Authority
43	D	D-14	*Gorsai*	*Cremation/ Burial Ground*	*0.5*	*55pt,83pt*	3.22	Govt. Land	Planning Authority/Local Authority
44	D	D-14	*Gorsai*	*Sewerage Treatment Plant*	*2*	*83pt*	3.22	Govt. Land	Planning Authority/Local Authority
45	D	D-14	*Gorsai*	*Play Ground*	*4.3*	*19pt, 55pt, 83pt,*	3.22	Private Land	Planning Authority/Local Authority
46	D	D-14	*Gorsai*	*Dispensary / Maternity Home*	*0.5*	*75pt, 76pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
47	D	D-15	*Gorsai*	*Play Ground*	*1.0*	*75pt,76pt*	3.22	Private Land	Planning Authority/Local Authority
48	D	D-16	*Gorsai*	*Primary School*	*0.5*	*19pt*	3.22	Private Land	Planning Authority/State Education Department
49	D	D-16	*Gorsai*	*Primary School*	*0.6*	*15pt,75pt*	3.22	Private Land	Planning Authority/State Education Department
50	D	D-17	*Gorsai*	*Secondary School*	*1.5*	*19pt, 75pt*	3.22	Private Land	Planning Authority/State Education Department
Sector - E									
1	E	E-1	*Shelar*	*Water Works*	*10.8*	*82pt, 83pt, 84pt, 86pt, 90pt, 91, 92pt, 93pt, 94pt, 95pt*	9.60	Private Land	Planning Authority/Local Authority
2	E	E-1	*Shelar*	*Garden*	*1.21*	*89pt,*	9.60	Private Land	Planning Authority/Local Authority
3	E	E-1	*Shelar*	*Play Ground*	*5.39*	*89pt,98pt, 99pt, 100pt, 101 pt, 106 pt*	9.60	Private Land	Planning Authority/Local Authority
4	E	E-1	*Shelar*	*Lake Beautification*	*0.4*	*81pt, 82pt, 83pt, 84pt*	9.60	Private Land	Planning Authority/Local Authority
5	E	E-2	*Borpada*	*Primary School*	*0.5*	*14pt,19pt, 22pt*	9.60	Private Land	Planning Authority/State Education Department
6	E	E-2	*Borpada*	*Town Hall*	*0.3*	*14pt, 19pt, 22pt,*	9.60	Private Land	Local Authority
7	E	E-3	*Vaghivali*	*Primary School*	*0.5*	*20pt*	2.67	Private Land	Planning Authority/State Education Department
8	E	E-3	*Borpada*	*Garden*	*0.4*	*11pt, 12pt, 13pt*	9.60	Private Land	Planning Authority/Local Authority
9	E	E-3	*Vaghivali*	*Library*	*0.2*	*20pt, 26pt*	2.67	Private Land	Local Authority
10	E	E-3	*Borpada*	*Vegetable*	*0.6*	*12pt, 33pt*	9.60	Private Land	Local Authority

				Market					
11	E	E-4	Borpada	Primary School	0.5	5pt,6pt,7pt	9.60	Private Land	Planning Authority/State Education Department
12	E	E-4	Borpada	Secondary School	1.1	6pt, 7pt, 9pt	9.60	Private Land	Planning Authority/State Education Department
13	E	E-4	Vaghivali	Secondary School	1.1	5pt, 20pt, 72pt, 75pt,Xpt	2.67	Private Land	Planning Authority/State Education Department
14	E	E-4	Vaghivali	Community Centre	0.3	5pt,72pt,Xpt	2.67	Private Land	Local Authority
15	E	E-4	Borpada	Dispensary / Maternity Home	0.2	5pt, 7pt	9.60	Private Land	State Health Department/Planning Authority/Local Authority
16	E	E-4	Borpada	Playground	0.6	5pt, 7pt, 11pt, 12pt	9.60	Private Land	Planning Authority/Local Authority
17	E	E-4	Borpada	Shopping Complex	0.9	5pt,12pt,33 pt	9.60	Private Land	Planning Authority/Local Authority.
18	E	E-4	Vaghivali	Post Office	0.2	72pt. Xpt.	2.67	Private Land	Planning Authority/Local Authority
19	E	E-5	Vaghivali	Primary School	0.5	46pt, 48pt, 49pt,50pt	2.67	Private Land	Planning Authority/State Education Department
20	E	E-5	Vaghivali	Secondary School	1.2	29pt,36pt, 37pt, 40pt	2.67	Private Land	Planning Authority/State Education Department
21	E	E-5	Kolhivali	Secondary School	1.5	49pt, 50pt, 53pt, 110pt	2.67	Private Land	Planning Authority/State Education Department
22	E	E-5	Vaghivali	Dispensary / Maternity Home	0.2	76pt	2.67	Private Land	State Health Department/Planning Authority/Local Authority
23	E	E-6	Kolhivali	Primary School	0.5	8pt, 48pt,49pt	2.67	Private Land	Planning Authority/State Education Department
24	E	E-6	Kolhivali	Dispensary / Maternity Home	0.21	8pt	2.67	Private Land	State Health Department/Planning Authority/Local Authority
25	E	E-6	Kawad Khurd	Police Station	0.2	140Apt, 189pt	2.67	Govt. Land	Police Department
26	E	E-6	Kawad Khurd	Dispensary / Maternity Home	0.2	139pt, 140Apt	2.67	Private & Govt. Land S. No. 140A pt,	State Health Department/Planning Authority/Local Authority
27	E	E-6	Kolhivali	Garden	0.4	40Apt, 40Bpt,102pt ,	2.67	Private & Govt. Land S. No. 40B pt,	Planning Authority/Local Authority
28	E	E-6	Kolhivali	Playground	0.4	8pt, 48pt, 49pt, 110pt	2.67	Private Land	Planning Authority/Local Authority
29	E	E-6	Kawad Khurd	Shopping Complex	0.2	140Apt	2.67	Govt. Land	Local Authority
30	E	E-6	Kawad Khurd	Vegetable Market	0.5	136pt,139pt , 140Apt	2.67	Private & Govt. Land S. No. 140Apt,	Local Authority
31	E	E-7	Kawad Khurd	Primary School	0.5	129pt	2.67	Govt. Land	Planning Authority/State Education Department
32	E	E-7	Kawad Khurd	Secondary School	1.0	129pt, 130pt, 131pt	2.67	Private & Govt. Land S. No. 129pt,	Planning Authority/State Education Department
33	E	E-8	Kawad Khurd	Vegetable Market	0.7	110/3Pt,110 / 9pt	2.67	Private Land	Local Authority
34	E	E-7	Rohini	Secondary School	1.1	12pt, 13pt, 14pt, 15pt	2.67	Private & Govt. Land S. No. 12 pt,	Planning Authority/State Education Department
35	E	E-8	Rohini	Dispensary / Maternity Home	0.62	12pt	2.67	Govt. land	Planning Authority/State Education Department
36	E	E-8	Kawad Khurd	Shopping Complex	0.9	110/3pt,110 /9pt,123Apt, 123Bpt,123 Cpt	2.67	Private Land	Planning Authority/Local Authority
37	E	E-7	Rohini	Playground	0.5	12pt, 14pt, 15pt	2.67	Private & Govt. Land S. No. 233/3pt, pt,	Planning Authority/Local Authority
38	E	E-9	Kawad Khurd	Dispensary / Maternity Home	0.3	148pt,149pt , 150pt	2.67	Private Land	Planning Authority/State Education Department

39	E	E-8	*Kawad Khurd*	*Garden*	*0.4*	*149pt, 150pt, 159pt 162pt*	2.67	Private Land	Planning Authority/Local Authority
40	E	E-11	*Kawad Khurd*	*Primary School*	*0.5*	*105pt, 111pt, 112pt*	2.67	Private Land	Planning Authority/State Education Department
41	E	E-11	*Kawad Khurd*	*Town Hall*	*0.3*	*110/9pt,123 Apt*	2.67	Private Land	Local Authority
42	E	E-1	*Shelar*	*Garden*	*1.9*	*87*	9.60	Private Land	Planning Authority/Local Authority
43	E	E-12	*Kawad Khurd*	*Play ground*	*0.2*	*105pt , 111pt*	2.67	Govt. Land	Planning Authority/Local Authority
44	E	E-12	*Kawad Khurd*	*Secondary School*	*1.2*	*102pt, 103pt ,104pt,105pt, 106pt*	2.67	Private Land	Planning Authority/State Education Department
45	E	E-12	*Sontakka*	*Dispensary / Maternity Home*	*0.4*	*49pt,61pt*	2.67	Govt. Land	State Health Department/Planning Authority/Local Authority
46	E	E-1	*Vaghivali /Kawad Khurd*	*Play Ground*	*4.1*	*Vaghivali 9,64,69pt, Kawad Khurd 174pt*	2.67	Private Land	Planning Authority/Local Authority
47	E	E-1	*Kawad Khurd*	*Play Ground*	*0.6*	*134 pt,*	2.67	Private Land	Planning Authority/Local Authority
48	E	E-3	*Vaghivali*	*Lake Beautification*	*1.5*	*29pt,34pt, 35pt, 36pt ,37pt, 66/8pt*	2.67	Private Land	Planning Authority/Local Authority
Sector- F									
1	F	F-1	*Yavai*	*Primary School*	*1.1*	*55pt, 57pt, 65pt ,61/77pt*	7.17	Private & Govt. Land S. No.61 pt,	Planning Authority/State Education Department
2	F	F-1	*Yavai*	*Playground*	*0.5*	*61pt.*	2.67	Govt. Land	Planning Authority/Local Authority
3	F	F-1	*Yavai*	*Secondary School*	*1.4*	*55pt, 56pt, 57pt,61pt,77pt*	2.67	Private & Govt. Land S. No. 61pt,	Planning Authority/State Education Department
4	F	F-1	*Yavai*	*Hospital*	*0.9*	*42pt, 50pt, 61pt*	2.67	Govt. Land	State Health Department/Planning Authority/Local Authority
5	F	F-1	*Yavai*	*Dispensary / Maternity Home*	*0.4*	*61pt, 65pt, 77pt,*	2.67	Private & Govt. Land S. No. 61pt,	State Health Department/Planning Authority/Local Authority
6	F	F-3	*Nimbavali/ Yavai*	*Primary School*	*0.3*	*Nimbavali, 68Apt, Yavai 68pt,69pt*	2.67	Private Land	Planning Authority/State Education Department
7	F	F-3	*Nimbavali*	*Secondary School*	*1*	*63pt, 64pt, 68 Apt, 68Bpt*	2.67	Private Land	Planning Authority/State Education Department
8	F	F-3	*Nimbavali*	*Playground*	*0.5*	*64pt, 68Apt, 68Bpt*	2.67	Private Land	Planning Authority/Local Authority
9	F	F-4	*Nimbavali*	*Dispensary / Maternity Home*	*0.2*	*62pt, 68Apt*	2.67	Private Land	State Health Department/Planning Authority/Local Authority
10	F	F-5	*Nimbavali*	*Primary School*	*0.5*	*45pt, 54pt,*	2.67	Private Land	Planning Authority/State Education Department
11	F	F-5	*Nimbavali*	*Playground*	*0.4*	*52pt, 56pt*	2.67	Private Land	Planning Authority/Local Authority
12	F	F-5	*Nimbavali*	*Secondary School*	*1.1*	*56pt,57pt, 77pt, 78pt*	2.67	Private Land	Planning Authority/State Education Department
13	F	F-5	*Nimbavali*	*Community Centre*	*0.2*	*78pt*	2.67	Private Land	Local Authority
14	F	F-6	*Nimbavali*	*Primary School*	*0.5*	*51pt, 78pt*	2.67	Private Land	Planning Authority/State Education Department
15	F	F-8	*Nimbavali*	*Playground*	*8.2*	*9pt, 10pt, 11pt, 12pt, 14, 15, 16pt, 18pt,*	2.67	Private Land	Planning Authority/Local Authority

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16	F	F-7	Nimbavali	Primary School	0.5	21pt	2.67	Private Land	Planning Authority/State Education Department
17	F	F-7	Nimbavali	Secondary School	1.1	21pt,80pt	2.67	Private Land	Planning Authority/State Education Department
18	F	F-7	Nimbavali	Dispensary / Maternity Home	0.2	51pt, 56pt,78pt	2.67	Private Land	State Health Department/Planning Authority/Local Authority
19	F	F-7	Nimbavali	Dispensary / Maternity Home	0.4	21pt	2.67	Private Land	State Health Department/Planning Authority/Local Authority
20	F	F-7	Nimbavali	Lake Beautification	1.8	19pt, 31pt, 32pt	2.67	Private Land	Planning Authority/Local Authority
21	F	F-8	Nimbavali / Gorsai/ Bhinar	College	3.4	Nimbavali 10pt, 11pt, Gorsai 1pt, 19pt, 80pt, Bhinar 107pt	3.22	Private Land	Planning Authority/State Education Department
22	F	F-8	Nimbavali	Police Station	0.5	10pt, 11pt	2.67	Private Land	Police Department
23	F	F-8	Nimbavali	Post Office	0.6	11pt	2.67	Private Land	Postal Department
24	F	F-8	Nimbavali/ Kashivali	Library	0.4	21pt,80pt, Kashivali 31pt	2.67	Private Land	Local Authority
25	F	F-8	Nimbavali	Playground	0.4	21pt, 80pt	3.22	Private Land	Planning Authority/Local Authority
26	F	F-9	Kashivali	Hospital	0.6	21pt, 22pt, 23pt, 37pt	3.22	Private Land	State Health Department/Planning Authority/Local Authority
27	F	F-9	Kashivali	Post Office	0.2	23pt ,37pt	3.22	Private Land	Postal Department
28	F	F-11	Dhamangaon	Primary School	0.5	37pt, 51pt, 129pt	3.22	Private Land	Planning Authority/State Education Department
29	F	F-11	Dhamangaon	Secondary School	1.0	37pt, 127pt, 128pt, 129pt	3.22	Private Land	Planning Authority/State Education Department
30	F	F-11	Dhamangaon	Playground	0.5	51pt, 99pt, 129pt,	3.22	Private Land	Planning Authority/Local Authority
31	F	F-11	Dhamangaon	Vegetable Market	1.4	133pt,146pt	3.22	Private Land	Local Authority
32	F	F-11	Dhamangaon	Shopping Complex	1.4	129pt, 128pt ,130pt, 133pt	3.22	Private Land	Local Authority
33	F	F-12	Nimbavali	Police Station	0.2	28pt, 29pt	3.22	Private Land	Police Department
34	F	F-12	Nimbavali	Town Hall	0.2	28pt, 39pt	3.22	Private Land	Local Authority
35	F	F-13	Dhamangaon	Dispensary / Maternity Home	0.2	48pt, 161pt	3.22	Private Land	State Health Department/Planning Authority/Local Authority
36	F	F-14	Dhamangaon	Secondary School	1.0	60pt, 108pt, 109pt, 117pt, 118pt,	3.22	Private Land	Planning Authority/State Education Department
37	F	F-14	Dhamangaon	Lake Beautification	3.9	21pt,22pt,42pt, 60pt, 119pt, 120pt, 121pt, 122pt,160pt	3.22	Private Land	Planning Authority/Local Authority
38	F	F-20	Vadpe	Secondary School	1.1	1Bpt, 109bpt, 110pt	7.74	Private Land	Planning Authority/State Education Department
39	F	F-20	Vadpe /Dhamangaon	Shopping Complex	0.4	Vadpe 1Bpt, 110pt, Dhamangaon 21pt	7.74	Private Land	Local Authority
40	F	F-19	Vadpe	Dispensary / Maternity	0.2	109Bpt	7.74	Private Land	State Health Department/Planning

				Home					Authority/Local Authority
41	F	F-20	*Vadpe*	*Primary School*	*0.9*	*1Bpt, 110pt*	7.74	Private Land	Planning Authority/State Education Department
42	F	F-20	*Vadpe*	*Playground*	*0.6*	*1Bpt,*	7.74	Private Land	Planning Authority/Local Authority
43	F	F-20	*Dhamangaon*	*Fire Station*	*0.4*	*3pt, 12pt,*	3.22	Private Land	Planning Authority/Local Authority
44	F	F-20	*Dhamangaon*	*Police Station*	*0.4*	*3pt, 4pt, 12pt, 15pt*	3.22	Private Land	Police Department
45	F	F-21	*Dhamangaon*	*Primary School*	*0.5*	*16pt, 18pt, 20pt*	3.22	Private Land	Planning Authority/State Education Department
46	F	F-21	*Dhamangaon*	*Dispensary / Maternity Home*	*0.3*	*20pt, 21pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
47	F	F-23	*Gorsai*	*Water Works*	*13.2*	*18pt,19pt, 58pt, 59pt, , 72pt, 81pt*	3.22	Private Land	Planning Authority/Local Authority
48	F	F-22	*Dhamangaon*	*Secondary School*	*1.0*	*1pt ,16pt*	3.22	Private Land	Planning Authority/State Education Department
49	F	F-21	*Dhamangaon*	*Primary School*	*0.5*	*109pt, 110pt ,111pt , 116pt, 117pt*	3.22	Private Land	Planning Authority/State Education Department
50	F	F-18	*Vadpe*	*Parking*	*0.6*	*…..*	7.74	Private Land	Planning Authority/Local Authority
51	F	F-23	*Vadpe*	*Lake Beautification*	*5.2*	*34pt,, 47,48pt, 114pt,128*	7.74	Private Land	Planning Authority/Local Authority
52	F	F-8	*Nimbavali*	*Garden*	*0.5*	*15pt,16pt,18pt*	3.22	Private Land	Planning Authority/Local Authority
53	F	F-8	*Nimbavali*	*Garden*	*0.3*	*17*	3.22	Private Land	Planning Authority/Local Authority
54	F	F-19	*Dhamangaon / Vadpe*	*Garden*	*3.2*	*49pt,50ptVadape ,X pt*	3.22	Private Land	Planning Authority/Local Authority
55	F	F-16	*Vadpe/Dhamangaon*	*Garden*	*4.8*	*Vadpe 125B, 130pt, Dhamangaon 30pt, 31Apt, 32pt, 33pt.*	7.74	Private Land	Planning Authority/Local Authority
56	F	F-13	*Dhamangaon*	*Playground*	*1.2*	*52pt,69pt,70Apt*	3.22	Private Land	Planning Authority/Local Authority
57	F	F-2	*Yavai/ Dhamangaon/Bhinar*	*Garden*	*7.3*	*Yavai 64pt, Dhamangaon, 1Apt, 42Bpt,44A, Xpt., Bhinar 95 pt*	7.74	Private Land	Planning Authority/Local Authority
58	F	F-23	*Nimbavali*	*Play Ground*	*1.3*	*12pt,13pr*	3.22	Private Land	Planning Authority/Local Authority
Sector- G									
1	G	G-1	*Yavai*	*Electricity Sub - Station*	*1.9*	*25pt, 27pt, 28pt*	7.74	Private Land	State Electricity Board
2	G	G-1	*Yavai*	*Garden*	*1.1*	*10pt,11pt*	7.74	Private Land	Planning Authority/Local Authority
3	G	G-2	*Yavai / Valshind*	*Water Works*	*27.0*	*Yavai 29pt,30pt, 31, 32,33, 34, 35, 36,37pt, 38pt,41pt,42pt, 43pt, 92, 93*Valshind *30pt,31pt,32pt 35pt, 36pt ,37pt*	7.74	Private Land	Planning Authority/Local Authority
4	G	G-2	*Valshind*	*Lake*	*0.5*	*38pt, 39pt,*	3.22	Private & Govt.	Planning Authority/Local

				Beautification		*40,* 41pt		Land S. No. 39pt,	Authority
5	G	G-4	*Elkunde*	*Hospital*	*0.8*	*15pt,,17pt, 18pt*	3.22	Private & Govt. Land S. No. 18pt,	State Health Department/Planning Authority/Local Authority
6	G	G-4	*Elkunde*	*Garden*	*1.2*	*1pt*	3.22	Govt. Land	Planning Authority/Local Authority
7	G	G-4	*Elkunde*	*Play Ground*	*3.8*	*61pt, 62pt, 63pt*	3.22	Govt. Land	Planning Authority/Local Authority
8	G	G-5	*Kasbe Sonale*	*Play Ground*	*1.3*	*49pt,51pt*	7.28	Private Land	Planning Authority/Local Authority
9	G	G-6	*Elkunde*	*Dispensary / Maternity Home*	*0.4*	*30pt, 35pt, 36pt, 37pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
10	G	G-7	*Elkunde*	*Primary School*	*0.5*	*15pt, 19pt, 26pt*	3.22	Private Land	Planning Authority/State Education Department
11	G	G-7	*Elkunde*	*Secondary School*	*1*	*15pt, 18pt, 19pt*	3.22	Private & Govt. Land S. No. 18pt,	Planning Authority/State Education Department
12	G	G-7	*Elkunde*	*Playground*	*1.4*	*37pt, 38pt*	3.22	Private & Govt. Land S. No. 38pt,	Planning Authority/Local Authority
13	G	G-7	*Elkunde*	*Post Office*	*0.2*	*15pt, 25pt, 26pt,27pt*	3.22	Private Land	Postal Department
14	G	G-8	*Elkunde*	*Playground*	*0.9*	*15pt, 18pt*	3.22	Private & Govt. Land S. No. 18pt,	Planning Authority/Local Authority
15	G	G-9	*Elkunde*	*Primary School*	*0.5*	*9pt, 10pt, 14pt, 69pt*	3.22	Private Land	Planning Authority/State Education Department
16	G	G-9	*Elkunde*	*Cremation/ Burial Ground*	*0.3*	*3pt*	3.22	Private Land	Planning Authority/Local Authority
17	G	G-10	*Shivnagar*	*Primary School*	*0.6*	*90pt, 91pt, 92pt*	3.22	Private Land	Planning Authority/State Education Department
18	G	G-10	*Shivnagar*	*Secondary School*	*1.1*	*91pt, 92pt*	3.22	Private Land	Planning Authority/State Education Department
19	G	G-12	*Kasbe Sonale*	*Dispensary / Maternity Home*	*0.6*	*28pt,34pt, 62pt*	7.28	Private Land	State Health Department/Planning Authority/Local Authority
20	G	G-14	*Kasbe Sonale*	*Garden*	*0.6*	*63pt, 64pt*	7.28	Private Land	Planning Authority/Local Authority
21	G	G-15	*Kasbe Sonale*	*Play Ground*	*6.1*	*69pt,70pt,71pt, 73pt, 74pt, 75pt, 76, 77pt, 79pt,*	7.28	Private Land	Planning Authority/Local Authority
22	G	G-18	*Rajnagar /Kasbe Sonale*	*Fire Station*	*0.5*	*Rajnagar 2pt,4pt, Kasbe Sonale 115pt*	7.28	Private Land	Planning Authority/Local Authority
23	G	G-18	*Saravali*	*Dispensary / Maternity Home*	*0.3*	*26pt,27pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
24	G	G-22	*Kon/Gove*	*Primary School*	*0.5*	*Gove 97pt, Kon 191pt*	13.97	Private Land	Planning Authority/State Education Department
25	G	G-22	*Kon*	*Secondary School*	*1.1*	*232pt,235pt ,236pt, 260pt*	13.97	Private Land	Planning Authority/State Education Department
26	G	G-23	*Kon*	*Primary School*	*0.5*	*235pt,238pt , 239pt, 260pt*	13.97	Private Land	Planning Authority/State Education Department
27	G	G-23	*Kon*	*Dispensary / Maternity Home*	*0.3*	*238pt,239pt*	13.97	Private Land	State Health Department/Planning Authority/Local Authority
28	G	G-24	*Kon*	*Play Ground*	*11.7*	*207pt,226pt ,227pt,228pt, 229pt,230pt 234pt,235pt ,239pt,240pt,241pt 243pt,245pt ,250pt*	13.97	Private Land	Planning Authority/Local Authority
29	G	G-5	*Elkunde*	*Garden*	*0.15*	*32pt*	3.22	Govt. Land	Planning Authority/Local Authority

30	G	G-4	*Elkunde*	*Garden*	*1*	*11pt, 12pt, 14pt, 69pt*	3.22	Private Land	Planning Authority/Local Authority
31	G	G-10	*Shivnagar*	*Garden*	*1.3*	*91pt*	3.22	Private Land	Planning Authority/Local Authority
Sector-H									
1	H	H-2	*Kasbe Sonale*	*Lake Beautification*	*1.1*	*111pt,142pt , 144pt*	7.28	Private land	Planning Authority/Local Authority
2	H	H-4	*Kasbe Sonale*	*Playground*	*16.6*	*31pt , 39pt, 40pt , 41pt, 42, 43pt, 44pt, 46,47, 48pt, 49pt, 50pt, 52pt*	7.28	Private Land	Planning Authority/Local Authority
3	H	H-6	*Valshind*	*Garden, Ground Water Recharge*	*41.27*	*1,2,3,4,8pt,, 10pt,11pt, 46,47pt,49pt,50pt*	3.22	Private Land	Planning Authority/Local Authority
4	H	H-7	*Yavai*	*Water Works*	*13.6*	*21, 22,23pt, 37pt,38pt, 39, 40pt ,44pt, 45pt, 46, 47, 48*	7.74	Private Land	Planning Authority/Local Authority
5	H	H-9	*Yavai/ Bhinar*	*Play Ground*	*3.6*	*Yavai 61pt, , Bhinar 17pt, 95pt, 124*	7.74	Private Land	Planning Authority/Local Authority
6	H	H-1	*Gholgaon*	*Dispensary / Maternity Home*	*0.2*	*11pt, 13pt, 21pt,*	7.28	Private land	State Health Department/Planning Authority/Local Authority
7	H	H-6	*Valshind*	*Play Ground*	*17.83*	*,33pt,34pt,45pt,46pt,47pt,*	3.22	Private Land	Planning Authority/Local Authority
8	H	H-6	*Valshind*	*Garden*	*1.1*	*32pt,33pt*	3.22	Private Land	Planning Authority/Local Authority
Sector - I									
1	I	I-1	*Kon*	*Primary School*	*0.5*	*55Apt., 57pt, 58pt, 290pt, 296pt*	13.97	Private Land	Planning Authority/State Education Department
2	I	I-2	*Kon*	*Secondary School*	*1.1*	*27pt, 28pt, 51pt, 305pt*	13.97	Private & Govt. Land S. No. 305pt,	Planning Authority/State Education Department
3	I	I-2	*Kon*	*Police Station*	*0.6*	*60pt*	13.97		Police Department
4	I	I-2	*Kon*	*Play Ground*	*0.9*	*51pt, 53pt, 54pt, 60pt*	13.97	Private Land	Planning Authority/Local Authority
5	I	I-2	*Kon*	*Dispensary / Maternity Home*	*0.2*	*25pt,305pt*	13.97	Govt. Land	State Health Department/Planning Authority/Local Authority
6	I	I-2	*Kon*	*Post Office*	*0.3*	*54pt,59pt,299pt*	13.97	Private Land	Postal Department
7	I	I-3	*Kon*	*Primary School*	*0.57*	*28pt, 29pt*	13.97	Private Land	Planning Authority/State Education Department
8	I	I-4	*Kon*	*Primary School*	*0.5*	*14pt, 32pt, 33pt, 38pt, 40pt*	13.97	Private Land	Planning Authority/State Education Department
9	I	I-4	*Kon*	*Fire Station*	*0.5*	*47pt, 48pt, 51pt, 61pt,63pt*	13.97	Private Land	Planning Authority/Local Authority
10	I	I-5	*Kon*	*Primary School*	*0.5*	*165pt, 166pt*	13.97	Private Land	Planning Authority/State Education Department
11	I	I-5	*Kon*	*Secondary School*	*1.1*	*160pt,166pt , 167pt, 168pt, 169pt, 170pt*	13.97	Private Land	Planning Authority/State Education Department
12	I	I-5	*Kon*	*Community Centre*	*0.2*	*14pt, 32pt, 40pt,100pt*	13.97	Private Land	Local Authority
13	I	I-5	*Kon*	*Dispensary / Maternity Home*	*0.5*	*160pt,161pt , 169pt*	13.97	Private Land	State Health Department/Planning Authority/Local Authority
14	I	I-8	*Kon*	*Playground*	*0.4*	*167pt,170pt*	13.97	Private Land	Planning Authority/Local

						, Xpt,			Authority
15	I	I-9	*Gove*	*College*	*5.3*	*98pt,99pt, 101pt,102pt , 104pt,105pt , 106pt,107pt , 133,Xpt*	9.58	Private Land	Planning Authority/State Education Department
16	I	I-9	*Gove*	*Vegetable Market*	*1.1*	*98pt,106pt, 107pt, 108pt*	9.58	Private Land	Local Authority
17	I	I-10	*Gove*	*Primary School*	*0.5*	*90pt, 110pt*	9.58	Private Land	Planning Authority/State Education Department
18	I	I-11	*Gove*	*Secondary School*	*1*	*89pt, 90pt, 91pt, 92pt*	9.58	Private Land	Planning Authority/State Education Department
19	I	I-11	*Pimpal ghar*	*Garden*	*0.6*	*60pt, 80pt*	9.19	Private Land	Planning Authority/Local Authority
20	I	I-12	*Pimpal ghar*	*Primary School*	*0.6*	*25pt, 26pt, 46pt,64pt*	9.19	Private & Govt. Land S. No. 25pt, 26pt,	Planning Authority/State Education Department
21	I	I-12	*Pimpal ghar*	*Secondary School*	*1.3*	*17pt,25pt, 26pt, 46pt, 64pt,65pt*	9.19	Private & Govt. Land S. No. 25pt,	Planning Authority/State Education Department
22	I	I-13	*Ranjnoli*	*Primary school*	*0.5*	*43pt, 44pt, 45pt, 105pt,*	9.59	Private land	Planning Authority/State Education Department
23	I	I-13	*Ranjnoli*	*Dispensary / Maternity Home*	*0.2*	*5pt*	9.59	Private land	State Health Department/Planning Authority/Local Authority
24	I	1-43	Ranjnoli	Shopping Complex	2.5	22pt,30pt, 74 pt	9.59	Private Land	Planning Authority/Local Authority
25	I	I-15	*Ranjnoli*	*Primary school*	*0.5*	*6pt,7pt,26pt ,42pt,43pt*	9.59	Private land	Planning Authority/State Education Department
26	I	I-15	*Ranjnoli*	*Secondary School*	*1.2*	*6pt, 7pt, 25pt, 26pt, 27pt, 42pt, 43pt*	9.59	Private land	Planning Authority/State Education Department
27	I	I-16	*Ranjnoli*	*Playground*	*0.7*	*7pt, 26pt.89pt, 93pt*	9.59	Private land	Planning Authority/Local Authority
28	I	I-17	*Pimpalgh ar*	*Primary school*	*0.5*	*8pt, 9pt,*	9.19	Private land	Planning Authority/State Education Department
29	I	I-17	*Pimpalgh ar*	*Dispensary / Maternity Home*	*0.2*	*29pt, 30pt, 31pt*	9.19	Private land	State Health Department/Planning Authority/Local Authority
30	I	I-18	*Gove*	*Primary School*	*0.5*	*76pt, 78pt, 131pt,132pt ,*	9.58	Private Land	Planning Authority/State Education Department
31	I	I-18	*Gove*	*Community Centre*	*0.2*	*76pt, 131pt*	9.58	Private Land	Local Authority
32	I	I-19	*Gove*	*Dispensary / Maternity Home*	*0.2*	*86pt,*	9.58	Govt. Land	State Health Department/Planning Authority/Local Authority
33	I	I-21	*Gove*	*Primary School*	*0.5*	*107pt, 113pt*	9.58	Private Land	Planning Authority/State Education Department
34	I	I-21	*Gove*	*Secondary School*	*1.2*	*106pt,107pt , 113pt,114pt*	9.58	Private Land	Planning Authority/State Education Department
35	I	I-21	*Gove*	*Fire Station*	*0.4*	*11pt,105pt, 106pt*	9.58	Private Land	Planning Authority/Local Authority
36	I	I-21	*Gove*	*Playground*	*0.7*	*106pt, 107pt*	9.58	Private Land	Planning Authority/Local Authority
37	I	I-22	*Gove*	*Primary School*	*0.5*	*15pt, 16pt*	9.58	Private Land	Planning Authority/State Education Department
38	I	I-22	*Gove*	*Secondary School*	*1.5*	*15pt,16pt, 26pt, 27pt, 28pt, 29pt*	9.58	Private Land	Planning Authority/State Education Department
39	I	I-22	*Gove*	*Police Station*	*0.4*	*10pt, 11pt*	9.58	Private Land	Police Department
40	I	I-22	*Gove*	*Post Office*	*0.4*	*11pt*	9.58	Private Land	Postal Department
41	I	I-22	*Gove*	*Hospital*	*1.1*	*11pt, 104pt, 105pt*	9.58	Private Land	State Health Department/Planning Authority/Local Authority

42	I	I-22	*Gove*	*Garden*	*3.4*	*14, 31pt 32,33, 35pt ,36pt ,148pt, 150,170,*	9.58	Private Land	Planning Authority/Local Authority
43	I	I-23	*Kon*	*Primary School*	*0.5*	*111pt,133pt , 154pt,155pt*	13.97	Private Land	Planning Authority/State Education Department
44	I	I-23	*Kon*	*Secondary School*	*1*	*111pt,112pt , 123pt, 155pt*	13.97	Private Land	Planning Authority/State Education Department
45	I	I-24	*Kon/ Gove*	*Library*	*0.5*	*Kon 179pt, Gove 11pt, 102pt, 103pt, 104pt*	13.97	Private Land	Local Authority
46	I	I-24	*Kon*	*Town Hall*	*0.4*	*170pt,171pt , 300pt,*	13.97	Private Land	Local Authority
47	I	I-26	*Kon*	*Primary School*	*0.5*	*107pt,110pt , 156pt, 159pt*	13.97	Private Land	Planning Authority/State Education Department
48	I	I-27	*Kon*	*Primary School*	*0.6*	*65pt, 66pt, 67pt*	13.97	Private Land	Planning Authority/State Education Department
49	I	I-27	*Kon*	*Secondary School*	*1.5*	*66pt, 67pt, 82pt, 83pt*	13.97	Private Land	Planning Authority/State Education Department
50	I	I-27	*Kon*	*Hospital*	*0.5*	*47pt, 48pt, 63pt*	13.97	Private Land	State Health Department/Planning Authority/Local Authority
51	I	I-28	*Kon*	*Dispensary / Maternity Home*	*0.6*	*81pt, 82pt, 83pt,Xpt,*	13.97	Private Land	State Health Department/Planning Authority/Local Authority
52	I	I-28	*Kon*	*Playground*	*0.4*	*69pt, 83pt, Xpt*	13.97	Private Land	Planning Authority/Local Authority
53	I	I-28	*Kon*	*Library*	*0.5*	*75pt, 98pt,Xpt,*	13.97	Private Land	Local Authority
54	I	I-29	*Kon*	*Primary School*	*0.6*	*91pt, 93pt, 116pt*	13.97	Private Land	Planning Authority/State Education Department
55	I	I-29	*Kon*	*Playground*	*0.5*	*96pt,110pt, 111pt,112pt ,113pt*	13.97	Private Land	Planning Authority/Local Authority
56	I	I-29	*Kon*	*Vegetable Market*	*1.9*	*75pt, 95pt, 96pt, 98pt, 109pt, 110pt*	13.97	Private Land	Local Authority
57	I	I-29	*Kon*	*Shopping Complex*	*1.9*	*96pt, 109pt,110pt , 111pt, 156pt*	13.97	Private Land	Local Authority
58	I	I-30	*Kon*	*Cremation/ Burial Ground*	*0.6*	*62pt*	13.97	Private Land	Planning Authority/Local Authority
59	I	I-30	*Kon*	*Sewerage Treatment Plant*	*3.6*	*128pt,Xpt,*	13.97	Private Land	Planning Authority/Local Authority
60	I	I-30	*Gove*	*Garden*	*0.3*	*38pt,*	9.58	Private Land	Planning Authority/Local Authority
61	I	I-31	*Pimpalas*	*Jetties/Ferries*	*7.3*	*257pt,258pt , 250pt., Xpt.*	3.22	Private Land	State Transport Department/Planning Authority/Local Authority
62	I	I-32	*Gove*	*Primary School*	*0.5*	*47pt, 48pt, 53pt*	9.58	Private Land	Planning Authority/State Education Department
63	I	I-32	*Gove*	*Secondary School*	*1.4*	*44pt, 45pt, 46pt, 47pt, 48pt, 53 pt*	9.58	Private Land	Planning Authority/State Education Department
64	I	I-32	*Gove*	*Play ground*	*1.9*	*23pt,24pt,40pt,144pt,146,172pt*	9.58	Private Land	Planning Authority/Local Authority
65	I	I-32	*Gove*	*Playground*	*1.2*	*45pt, 46pt*	9.58	Private Land	Planning Authority/Local Authority
66	I	I-33	*Pimpalas*	*Secondary School*	*1.6*	*262pt, 270pt ,271pt*	3.22	Private Land	Planning Authority/State Education Department

67	I	I-32	*Pimpalas*	*Fish Market*	*1.2*	*249pt, 250pt,*	3.22	Private Land	Planning Authority/Local Authority
68	I	I-33	*Pimpalas*	*Playground*	*3.5*	*252pt,253pt , 254pt,255, 256, 257pt, 258pt*	3.22	Private Land	Planning Authority/Local Authority
69	I	I-34	*Pimpalner*	*Play Ground*	*2.2*	*12pt,13pt,14pt, 15pt,*	7.74	Private Land	Planning Authority/Local Authority
70	I	I-35	*Pimpalas*	*Primary School*	*0.5*	*267pt, 268pt, 269pt ,290pt*	3.22	Private Land	Planning Authority/State Education Department
71	I	I-35	*Pimpalas*	*Dispensary / Maternity Home*	*0.4*	*1pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
72	I	I-39	*Gove*	*Secondary School*	*1.0*	*1pt,117pt,118pt,119pt, 122pt*	9.58	Private Land	Planning Authority/State Education Department
73	I	I-39	*Gove*	*Dispensary / Maternity Home*	*0.3*	*1pt, 2pt, 122pt*	9.58	Private Land	State Health Department/Planning Authority/Local Authority
74	I	I-39	*Gove/Pimpalghar*	*Dispensary / Maternity Home*	*0.3*	*Gove 75pt,Pimpalghar Xpt*	9.58	Private Land	State Health Department/Planning Authority/Local Authority
75	I	I-40	*Pimpalghar*	*Secondary School*	*1.2*	*4pt, 7pt, 8pt, 9pt*	9.19	Private & Govt. Land S. No. 7pt,	Planning Authority/State Education Department
76	I	I-40	*Pimpalghar/Ranjnoli*	*Playground*	*0.7*	*Pimpalghar 7pt, 8pt, 9pt, Ranjnoli 20pt, 74pt*	9.59	Private Land	Planning Authority/Local Authority
77	I	I-40	*Pimpalghar*	*Vegetable Market*	*1*	*6pt, 7pt, 87pt,*	9.19	Private & Govt. Land S. No. 7pt,	Local Authority
78	I	I-41	*Pimpalas*	*Dispensary / Maternity Home*	*0.4*	*152pt,154pt , 155pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
79	I	I-43	*Pimpalas*	*Play Ground*	*1.9*	*118pt,442pt old,29pt.*	3.22	Private Land	Planning Authority/Local Authority
80	I	I-44	*Pimpalas*	*Fire Station*	*0.2*	*28pt, 32pt*	3.22	Private & Govt. Land S. No. 32pt,	Planning Authority/Local Authority
81	I	I-44	*Pimpalas*	*Garden*	*3.5*	*56pt,57pt, 60 pt, 65pt, 86pt,87pt, 118pt,119pt 133pt,134pt 135pt,442pt*	3.22	Private land	Planning Authority/Local Authority
82	I	I-45	*Pimpalas / Pimpalner*	*Lake Beautification*	*1.8*	*Pimpalas 44pt, 50pt, Pimpalner 123pt,*	7.74	Private Land	Planning Authority/Local Authority
83	I	I-45	*Pimpalas*	*Dispensary / Maternity Home*	*0.4*	*32pt, 33pt, 36pt*	3.22	Private & Govt. Land S. No. 32pt,	State Health Department/Planning Authority/Local Authority
84	I	I-45	*Pimpalas /Pimpalner*	*Garden*	*1.0*	*Pimpalas 60pt, 61pt, Pimpalner 122pt,123pt ,*	7.74	Private Land	Planning Authority/Local Authority
85	I	I-45	*Pimpalas /Pimpalner*	*Garden*	*1.8*	*Pimpalas 44pt,48pt,49pt, Pimpalner 123pt, 125pt., 129pt.,130pt, 131pt., 143pt.*	7.74	Private Land	Planning Authority/Local Authority
86	I	I-14	*Pimpalas*	*Garden*	*1.1*	*111pt,112pt ,114pt,115pt116pt,442pt old*	9.59	Private Land	Planning Authority/Local Authority

87	I	I-14	*Ranjnoli*	*Garden*	*0.4*	*36pt,50pt*	9.59	Private Land	Planning Authority/Local Authority
88	I	I-30	*Gove*	*Garden*	*0.24*	*38pt.*	9.58	Private Land	Planning Authority/Local Authority
Sector-J									
1	J	J-1	*Pimpalner/ Pimpalas*	*Garden*	*22.14*	*Pimpalner 1pt, 2pt, 3pt, 4pt,5pt,6pt, 36pt, 49, 47, 52, 53,54pt, 55pt, 61pt,142pt, 143pt, 151pt, 152pt 153pt, 154pt,155pt 156pt,162pt 163pt,164, 165pt, Pimpalas 44pt*	7.74	Private & Govt. Land Govt. lands= Pimpalner S. No. 142pt, Pimpalas 44 Ppt.	Planning Authority/Local Authority
2	J	J-2	*Ovali/ Vehele/ Pimpalner*	*Public/Semi-Public*	*121.7*	*Ovali 73pt,74pt, Vehele 35pt,42pt,43pt,44pt,45, 46,47,48,49 ,50,51pt,,52 ,53pt,54pt55,56,57,58, 59,60pt,65pt, 66pt, 73pt, Pimpalner 39pt,40pt,48,50,51,56, 57,58pt,59, 60,61,62,63 Ppt,,142,153pt,154pt,155pt,163pt*	7.74	Private & Govt. Land S. No. 53 pt,	Solid Waste Department
3	J	J-3	*Vehele/ Ovali*	*Garden*	*33.3*	*Vehele 15pt, 19pt,20,22, 23pt,24pt,25pt,32,34,35pt,36pt,37, 38,39,40pt, 41pt42pt,43pt, Ovali 5pt,6pt,8pt, 63pt,74pt,*	7.74	Private Land	Planning Authority/Local Authority
4	J	J-4	*Mankoli/ Sarang/ Vehele/Dapode*	*Public/Semi-Public*	*74.7*	*Mankoli 7pt, 8pt, 13pt,15pt, 16pt,17,18, 19,20,21,22 ,23,24,25,26,27,28,29, 30, 31pt, 32, 33, 34, 35, 36pt, 38pt,Vehele 21pt,40,41pt, Sarang 46pt47pt,48pt, Dapode 89pt,92pt,93pt,115pt*	7.74	Private & Govt. Land S.No.9pt,17,18,31pt,23pt,24,115pt	Solid Waste Department

5	J	J-6	*Pimpalner/ Vehele*	*Public/Semi-Public*	*1.8*	*Pimpalner 39pt, Vehele 71pt, 73pt*	7.74	Private Land	Solid Waste Department
6	J	J-7	*Vehele*	*Primary School*	*0.5*	*88pt*	7.74	Private Land	Planning Authority/State Education Department
7	J	J-7	*Pimpalner / Vehele*	*Secondary School*	*1.1*	*Pimpalner 28pt, Vehele 88pt, 90pt, 91pt,*	.74	Private Land	Planning Authority/State Education Department
8	J	J-8	*Vehele*	*Public/Semi-Public*	*8.8*	*65pt, 66pt,68pt, 71pt, 73pt*	7.74	Private Land	Solid Waste Department
9	J	J-9	*Vehele*	*Primary School*	*0.4*	*3pt,4pt, 6pt*	7.74	Private Land	Planning Authority/State Education Department
10	J	J-9	*Vehele*	*Secondary School*	*1*	*6pt,7pt,8pt*	7.74	Private Land	Planning Authority/State Education Department
11	J	J-9	*Sarang*	*Police Station*	*0.6*	*Sarang 4pt,*	7.74	Private Land	Police Department
12	J	J-9	*Vehele*	*Dispensary / Maternity Home*	*0.4*	*88pt,89pt, 90pt,93pt,100pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
13	J	J-8	*Vehele*	*Dispensary / Maternity Home*	*0.4*	*6pt, 7pt, 8pt,*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
14	J	J-9	*Vehele*	*Play Ground*	*1.8*	*71pt, 72pt, 79pt*	7.74	Private Land	Planning Authority/Local Authority
15	J	J-8	*Vehele*	*Lake Beautification*	*1.9*	*61pt,62pt, 64pt*	7.74	Private Land	Planning Authority/Local Authority
16	J	J8	*Vehele*	*Garden*	*3.2*	*13pt,25pr,26, 61pt, 63pt, 64pt*	7.74	Private Land	Planning Authority/Local Authority
17	J	J-10	*Pimpalner /Vehele*	*Garden/ (RTZ)*	*32.0*	*Pimpalner 5pt,6pt,7pt, 8pt..,9,10pt, 11,12pt,13pt,14pt,15pt, 16pt,17,18pt,19pt,20pt, 21pt,22,23, 24,25,26pt, 27,28pt,29pt,30pt,31pt, 32pt,33pt,34,35pt,36pt, 37pt,42pt, Xpt. Vehele 91pt,92pt,93pt,95pt,96 pt97pt,,98pt ,99pt.100pt, Xpt,*	7.74	Private Land	Planning Authority/Local Authority
18	J	J-11	*Sarang/Surai*	*Primary School*	*0.5*	*Surai 31pt, ,32pt,33pt Sarang 33pt,*	7.74	Private Land	Planning Authority/State Education Department
19	J	J-11	*Surai/ Sarang*	*Primary School*	*0.5*	*Sarang 20pt, Surai 53pt,*	7.74	Private & Govt. Land S. No. 20pt,	Planning Authority/State Education Department
20	J	J-11	*Sarang / Surai*	*Secondary School*	*1.6*	*Sarang 20pt, 21pt, 25pt., Surai 45pt.*	7.74	Private & Govt. Land S. No. 20pt,	Planning Authority/State Education Department
21	J	J-11	*Sarang*	*Community Centre*	*0.2*	*20pt*	7.74	Govt. Land	Local Authority
22	J	J-11	*Sarang*	*Play ground*	*0.9*	*19pt, 20pt, 21pt,*	7.74	Private & Govt. Land S. No. 20pt,	Planning Authority/Local Authority
23	J	J-11	*Sarang/ Surai*	*Dispensary / Maternity Home*	*0.2*	*Surai 31pt, Sarang 33pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
24	J	J-13	*Surai/*	*Primary*	*0.5*	*Surai 28pt,*	7.74	Private & Govt.	Planning Authority/State

			Mankoli	*School*		*Mankoli 48pt,*		Land S. No. 48pt,	Education Department
25	J	J-13	*Sarang*	*Public Semi Public*	*1.8*	*41pt,44pt, 45pt,47pt, 48pt,50pt*	7.74	Private Land	Solid Waste Department
26	J	J-14	*Mankoli*	*Dispensary / Maternity Home*	*0.4*	*48pt 49pt, 50pt,*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
27	J	J-15	*Mankoli*	*Dispensary / Maternity Home*	*0.3*	*69pt,70pt*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
28	J	J-15	*Mankoli*	*Playground*	*1.6*	*14, 15pt, 38pt 39pt,*	7.74	Private Land	Planning Authority/Local Authority
29	J	J-15	*Mankoli*	*Public Semi-Public*	*0.4*	*36pt*	7.74	Private Land	Planning Authority/Local Authority
30	J	J-16	*Mankoli*	*Primary School*	*0.5*	*3pt, 86pt 97pt,*	7.74	Private Land	Planning Authority/State Education Department
31	J	J-15	*Mankoli*	*Dispensary / Maternity Home*	*0.2*	*77pt, 86pt, 98pt,*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
32	J	J-17	*Anjur, Dive-Anjur*	*IRBT*	*11.1*	*Anjur - 210pt., 214pt.,215pt.,216pt.,217pt.,218pt., 219pt.,221pt.,222,223pt.,224pt.,225pt.,226pt.,259pt., Dive Anjur - 112pt.,114pt.,*	7.74	Private Land	State Transport Department/Planning Authority/Local Authority
33	J	J-18	*Anjur*	*Primary School*	*0.5*	*265pt,266pt, 267pt, 268pt 269pt,*	7.17	Private Land	Planning Authority/State Education Department
34	J	J-19	*Anjur*	*Playground*	*0.8*	*293pt,294pt,295pt, 296pt*	7.17	Private Land	Planning Authority/Local Authority
35	J	J-20	*Anjur/Bharodi*	*Secondary School*	*1.3*	*Anjur 290pt Bharodi 208pt,209pt,*	7.74	Private & Govt. Land S. No. 290pt,	Planning Authority/State Education Department
36	J	J-20	*Anjur*	*Community Centre*	*0.6*	*290pt*	7.17	Govt. Land	Local Authority
37	J	J-20	*Anjur/Bharodi*	*Dispensary / Maternity Home*	*0.6*	*Anjur 290pt, Bharodi 207*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
38	J	J-21	*Bharodi*	*Primary School*	*0.5*	*10pt,12pt,14pt,*	7.74	Private Land	Planning Authority/State Education Department
39	J	J-21	*Bharodi*	*Shopping Complex*	*1.3*	*24pt, 26pt*	7.74	Govt. Land	Local Authority
40	J	J-22	*Bharodi*	*Primary School*	*0.5*	*26pt, 48pt*	7.74	Govt. Land	Planning Authority/State Education Department
41	J	J-22	*Surai/Bharodi*	*Playground*	*1.5*	*Bharodi 48pt, Surai 76pt,*	7.74	Govt. Land	Planning Authority/Local Authority
42	J	J-22	*Bharodi/ Surai*	*Hospital*	*0.9*	*Bharodi 26pt, 48pt, Surai 76pt*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
43	J	J-22	*Bharodi*	*Fish market*	*1.7*	*106pt,107pt, 108pt*	7.74	Private Land	Local Authority
44	J	J-23	*Surai*	*Primary School*	*0.5*	*7pt, 10pt*	3.22	Private Land	Planning Authority/State Education Department
45	J	J-23	*Surai*	*Primary School*	*0.5*	*67pt, 73pt, 76pt*	3.22	Private & Govt. Land S. No. 76pt,	Planning Authority/State Education Department
46	J	J-23	*Surai*	*Secondary School*	*1.5*	*67pt,74pt, 76pt,77pt*	3.22	Private & Govt. Land S. No. 76pt,	Planning Authority/State Education Department
47	J	J-23	*Surai/ Bharodi*	*Secondary School*	*1.3*	*Surai 7pt, 8pt, Bharodi*	7.74	Private Land	Planning Authority/State Education Department

						18pt,			
48	J	J-23	*Surai*	*Secondary School*	*1.2*	*31pt, 33pt, 34pt, 35pt, 36pt, 37pt*	3.22	Private Land	Planning Authority/State Education Department
49	J	J-23	*Surai*	*Fire Station*	*0.5*	*61pt, 62pt*	3.22	Private Land	Planning Authority/Local Authority
50	J	J-23	*Surai*	*Library*	*0.4*	*67pt, 73pt, 76pt*	3.22	Private & Govt. Land S. No. 76pt,	Local Authority
51	J	J-23	*Surai*	*Post Office*	*0.3*	*73pt, 76pt*	3.22	Private & Govt. Land S. No. 76pt,	Postal Department
52	J	J-23	*Surai*	*Playground*	*0.5*	*7pt,10pt*	3.22	Private Land	Planning Authority/Local Authority
53	J	J-24	*Surai*	*Cremation/ Burial Ground*	*1*	*62pt*	3.22	Private Land	Planning Authority/Local Authority
54	J	J-25	*Bharodi*	*Garden*	*23.2*	*51pt,52pt,53pt,56pt,57pt,58,59,60,61pt,62pt,65pt,107pt,108pt,109,110,111,112,113,114,115,116pt,117,118,119,120pt,121pt,122pt,125pt*	7.74	Private Land	Planning Authority/Local Authority
55	J	J-3	*Vehele/ Sarang*	*Play Ground*	*8.5*	*Vehele 14pt,15pt,16,17,18pt,19pt,23pt,24pt,25pt. Sarang 48, 49*	7.74	Private land	Planning Authority/Local Authority
56	J	J-16	*Dive Anjur/ Mankoli*	*Garden*	*3.08*	*46pt,47pt,49pt,50pt,51pt, 52pt., 41pt. Mankoli 3pt, 88pt.,91pt, 92pt, 93pt, 95pt, 96pt, 97pt*	7.74	Private Land	Planning Authority/Local Authority
57	J	J-10	*Sarang/ Surai*	*Play Ground*	*8.1*	*Sarang 4pt,5pt,6,7, 8,9,10pt,12pt,14pt,16pt Surai 58pt,59pt*	7.74	Private Land	Planning Authority/Local Authority
58	J	J-1	*Pimpalner*	*Playground*	*4.96*	40pt,41pt,43pt,44,45,46pt,47pt, 49pt,	7.74	Private Land	Planning Authority/Local Authority
59	J	J-15	*Mankoli/ Dapode*	*Garden*	*0.6*	*Mankoli 3pt,5pt, Dapode 8pt,9pt,105pt*	3.22	Private Land	Planning Authority/Local Authority
60	J	J-4	*Dapode/ Ovali*	*Garden*	*2.6*	*89pt,92pt,93pt,115pt, Ovali 63pt*	7.74	Private & Govt. Land S. No. 115pt,	Planning Authority/Local Authority
61	J	J-14	*Anjur/ Mankoli/ Surai*	*VWM*	*31.2*	*Anjur 223pt,224pt., 225pt., ,227pt,237pt,238pt,239pt,240pt,241,242,243,244pt,245pt, 247pt,249pt,250,252pt, 259pt,*	7.74	Private Land	Local Authority

						Mankoli 45pt,46pt.,47pt,48pt.,49pt,50pt,51, 52, 53pt. ,54,55pt,56pt,62pt,63pt,64,65,66,67pt,68pt,69pt Surai 28pt			
62	J	J-21	Bharodi	Vegetable market	1.0	26pt,43pt	7.74	Private Land	Local Authority
63	J	J-24	Surai	Jetties/Ferries	7.0	58pt,60pt,62pt,68pt,69pt	3.22	Private Land	State Transport Department /Planning Authority/Local Authority
64	J	J-3	Vehele	Play Ground	7.10	25pt,27pt,28,29,30pt,31,32pt,33,34pt,61pt,63pt	7.74	Private Land	Planning Authority/Local Authority
Sector-K									
1	K	K-1	Bharodi	Primary School	0.5	193pt,215pt , 216pt, 217pt	7.74	Private Land	Planning Authority/State Education Department
2	K	K-1	Bharodi	Secondary School	1.5	193pt,194pt ,195pt,215pt,	7.74	Private Land	Planning Authority/State Education Department
3	K	K-1	Bharodi	Dispensary / Maternity Home	0.3	217pt	7.74	Private Land	State Health Department/Planning Authority/Local Authority
4	K	K-2	Bharodi	Playground	1	192pt,193pt , 194pt	7.74	Private Land	Planning Authority/Local Authority
5	K	K-3	Alimghar	Primary School	0.6	155pt,162pt , 163pt	7.74	Private Land	Planning Authority/State Education Department
6	K	K-3	Alimghar	Secondary School	1.1	150pt,151pt ,152pt,153pt, 154pt, 155pt, 156pt, 163pt	7.74	Private Land	Planning Authority/State Education Department
7	K	K-7	Anjur/Alimghar	Lake Beautification	0.8	Anjur 65pt, 66pt,Xpt, Alimghar 143pt,144pt ,146pt	7.74	Private Land	Planning Authority/Local Authority
8	K	K-4	Anjur	Lake Beautification	1.8	20pt., 21pt, 30pt, 38pt, 39pt, 40pt, 41pt, 42pt	7.17	Private Land	Planning Authority/Local Authority
9	K	K-5	Anjur	College	3.2	129pt,305pt ,306pt,307pt, 308pt, 309pt	7.17	Private Land	Planning Authority/State Education Department
10	K	K-5	Anjur	Fire Station	0.6	22pt,24pt, 25pt	7.17	Private Land	Planning Authority/Local Authority
11	K	K-5	Anjur	Police Station	0.9	17pt, 20pt, 21pt, 22pt, 23pt	7.17	Private Land	Police Department
12	K	K-5	Anjur	Library	1.1	4pt,5pt, 6pt, 7pt, 9pt, 10pt	7.17	Private Land	Local Authority
13	K	K-5	Anjur	Post Office	0.6	10pt,11pt, 25pt, 26pt	7.17	Private Land	Postal Department
14	K	K-5	Anjur	Hospital	1.8	1pt, 2pt, 3pt, 4pt, 7pt	7.17	Private Land	State Health Department/ Planning Authority/ Local Authority
15	K	K-5	Anjur	Telephone Exchange	0.55	22pt, 23pt, 25pt	7.17	Private Land	Planning Authority/Local Authority
16	K	K-5	Anjur	Town Hall	0.5	5pt,9pt, 10pt, 11pt,	7.17	Private Land	Local Authority

						25pt, 26pt			
17	K	K-5	*Anjur/ Bharodi*	*Shopping Complex*	*3.2*	*Anjur 17pt,20pt, 21pt 22pt, Bharodi 199pt,200pt ,201pt,212p t,214pt, 215pt,*	7.74	Private Land	Local Authority
18	K	K-6	*Anjur*	*Secondary School*	*1*	*9pt, 26pt, 27pt., Xpt.*	7.17	Private Land	Planning Authority/State Education Department
19	K	K-6	*Anjur*	*Secondary School*	*1.1*	*108pt,112pt , 120pt, 121pt*	7.17	Private Land	Planning Authority/State Education Department
20	K	K-6	*Anjur*	*Community Centre*	*0.2*	*83pt, 89pt*	7.17	Private Land	Local Authority
21	K	K-6	*Anjur*	*Lake Beautification*	*0.26*	*123pt,124pt ,125pt,126p t,*	7.17	Private Land	Planning Authority/Local Authority
22	K	K-7	*Anjur*	*Primary School*	*0.5*	*74pt, 75pt, 76pt, 77pt*	7.17	Private Land	Planning Authority/State Education Department
23	K	K-7	*Anjur*	*Primary School*	*0.5*	*55pt,57pt, 59pt,60pt,6 1pt*	7.17	Private Land	Planning Authority/State Education Department
24	K	K-7	*Anjur*	*Secondary School*	*1.0*	*55pt, 59pt, 61pt, 66pt,*	7.17	Private Land	Planning Authority/State Education Department
25	K	K-7	*Alimghar*	*Dispensary / Maternity Home*	*0.2*	*141pt, 149pt, 165pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
26	K	K-7	*Anjur*	*Dispensary / Maternity Home*	*0.3*	*70pt, 71pt, 84pt, 85pt*	7.17	Private Land	State Health Department/Planning Authority/Local Authority
27	K	K-7	*Anjur / Alimghar*	*Lake Beautification*	*1.9*	*Anjur 97pt,99pt, , Alimghar 106pt,107pt , 108pt, 109pt*	7.74	Private Land	Planning Authority/Local Authority
28	K	K-7	*Anjur*	*Shopping Complex*	*1.9*	*57pt, 59pt, 60pt, 68pt, 69pt, 70pt, 71pt*	7.17	Private Land	Local Authority
29	K	K-8	*Anjur*	*Primary School*	*0.5*	*116pt, 119pt*	7.17	Private Land	Planning Authority/State Education Department
30	K	K-9	*Dive Anjur/ Anjur*	*Primary School*	*0.5*	*Anjur 191pt, Dive Anjur Xpt,*	7.74	Private Land	Planning Authority/State Education Department
31	K	K-9	*Alimghar*	*Secondary School*	*2.5*	*65pt, 67pt, 68pt, 69pt, 70pt*	7.74	Private Land	Planning Authority/State Education Department
32	K	K-9	*Anjur / Dive Anjur*	*Secondary School*	*1.5*	*Anjur188pt, 190pt,191pt Dive Anjur Xpt,*	7.74	Private Land	Planning Authority/State Education Department
33	K	K-9	*Dive Anjur*	*Dispensary / Maternity Home*	*0.2*	*122pt,Xpt,*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
34	K	K-9	*Dive Anjur/ Anjur*	*Shopping Complex*	*2.0*	*Dive Anjur, 191pt,Xpt Anjur 187pt, 188pt,191pt*	7.74	Private Land	Local Authority
35	K	K-9	*Anjur/ Dive Anjur*	*Vegetable Market*	*2.0*	*180pt., 181pt,184pt ,185pt,186p t,187pt,188 pt Dive Anjur Xpt*	7.74	Private Land	Local Authority
36	K	K-10	*Dive Anjur*	*Primary School*	*0.5*	*127pt, 128pt,Xpt,*	7.74	Private Land	Planning Authority/State Education Department

37	K	K-10	*Dive Anjur*	*Playground*	*0.4*	*125pt,126pt ,127pt,128p t,Xpt*	7.74	Private Land	Planning Authority/Local Authority
38	K	K-10	*Dive Anjur*	*Primary School*	*0.5*	*1pt,2pt*	7.74	Private Land	Planning Authority/State Education Department
39	K	K-10	*Dive Anjur*	*Lake Beautification*	*0.7*	*60pt,72pt, 74pt, 75pt*	7.74	Private Land	Planning Authority/Local Authority
40	K	K-11	*Dive Anjur*	*Playground*	*2.5*	*221pt,222pt ,223pt,224p t,226pt,227 pt,234pt*	7.74	Private Land	Planning Authority/Local Authority
41	K	K-11	*Dive Anjur*	*Garden*	*4.24*	*2pt3pt,4pt, 5pt,6pt,7pt, 14pt,15pt, 57pt,58pt, 59pt,75pt, 76pt,77pt, 79pt, 89pt, 234pt,235pt ,236pt, 237pt, 244pt, 248pt,249pt .*	7.74	Private Land	Planning Authority/Local Authority
42	K	K-10	*Anjur /Dive Anjur*	*Play Ground*	*1.6*	*Anjur 182pt, 183pt, 184pt, 187pt Dive Anjur Xpt,*	7.74	Private Land	Planning Authority/Local Authority
43	K	K-11	*Anjur*	*Play Ground*	*1.6*	*168pt, 169pt*	7.17	Private Land	Planning Authority/Local Authority
44	K	K-9	*Alimghar*	*Play Ground*	*22.8*	*34pt.,42pt, 43pt., 47pt, 48,49,50pt, 51pt, 52pt, 53pt, 55pt, 56pt, 57, 58pt., 59, 60, 61, 62, 63pt,66pt, 67pt,179pt*	7.74	Private Land	Planning Authority/Local Authority
45	K	K-2	*Bharodi*	*Cremation/ Burial Ground*	*0.5*	*150pt*	7.74	Private Land	Planning Authority/Local Authority
46	K	K-12	*Alimghar*	*Jetties/Ferries*	*6.8*	*169,170, 171, 172*	7.74	Private Land	State Transport Department/Planning Authority/Local Authority
47	K	K-9	*Alimghar*	*Play Ground*	*24.85*	*2pt,6pt,7,8p t,89pt,90pt, 91,92,93,94 ,95,96pt,97 pt,98pt,99pt ,100pt,101p t,103pt,108 pt,111,112, 113pt,114pt ., 115, 116, 117,118*	7.74	Private Land	Planning Authority/Local Authority
48	K	K-11	*Dive Anjur*	*Play Ground*	*7.04*	*214,215,21 6,217pt,222 pt,223pt,,22 4pt*	7.74	Private Land	Planning Authority/Local Authority
Sector-L									
1	L	L-1	*Dive Anjur*	*Secondary School*	*1.5*	*17pt,19pt, 20pt, 21pt, 26pt,32pt*	7.74	Private Land	Planning Authority/State Education Department
2	L	L-4	*Kasheli*	*Fire Station*	*0.5*	*89pt, 90pt, 91pt*	7.17	Private Land	Planning Authority/Local Authority
3	L	L-4	*Kasheli*	*Police Station*	*0.3*	*89pt,90pt,9 1pt, 104pt*	7.17	Private Land	Police Department
4	L	L-5	*Gundava li*	*Primary School*	*0.5*	*26pt, 63pt*	7.74	Private Land	Planning Authority/State Education Department

5	L	L-5	*Dapode*	*Primary School*	*0.5*	*24pt, 27pt, 28pt*	7.74	Private Land	Planning Authority/State Education Department
6	L	L-5	*Gundavali*	*Lake*	*0.9*	*Xpt,*	---	---	---
7	L	L-5	*Gundavali*	*Secondary School*	*1*	*26pt, 44pt, 52pt, 63pt*	7.74	Private Land	Planning Authority/State Education Department
8	L	L-5	*Purne*	*Public Utility (Water Supply)*	*3.2*	*Xpt*	11.80	---	-----
9	L	L-5	*Gundavali*	*Playground*	*0.5*	*42pt, 44pt, 52pt, 51pt*	7.74	Private Land	Planning Authority/Local Authority
10	L	L-6	*Dapode/ Ovali*	*Fire station*	*0.2*	*Dapode 115pt, Ovali 63pt*	7.74	Private Land	Planning Authority/Local Authority
11	L	L-6	*Dapode*	*Lake Beautification*	*1.9*	*Xpt*	---	---	---
12	L	L-8	*Gundavali*	*Dispensary / Maternity Home*	*0.3*	*65pt,66pt,*	7.74	Govt. Land	State Health Department/Planning Authority/Local Authority
13	L	L-8	*Gundavali*	*Play Ground*	*0.7*	*94pt*	7.74	Private Land	Planning Authority/Local Authority
14	L	L-10	*Ovali*	*Primary school*	*0.5*	*18pt, 19pt, 41pt*	3.22	Private Land	Planning Authority/State Education Department
15	L	L-10	*Ovali*	*Secondary School*	*1.1*	*17pt, 18pt, 19pt*	3.22	Private Land	Planning Authority/State Education Department
16	L	L-10	*Ovali*	*Dispensary / Maternity Home*	*0.4*	*17pt, 19pt*	3.22	Private Land	State Health Department/Planning Authority/Local Authority
17	L	L-10	*Ovali*	*Lake Beautification*	*0.8*	*42pt, 46pt, 57*	3.22	Private Land	Planning Authority/Local Authority
18	L	L-11	*Ovali*	*Transport Facilities*	*22.1*	*19pt,30pt,35,36,37,39pt,40pt,41pt, 43pt,44pt,45pt,46pt,47, 69*	3.22	Private Land	State Transport Department/Planning Authority/Local Authority
19	L	L-12	*Kailashnagar*	*Dispensary / Maternity Home*	*0.3*	*29pt, 30pt*	16.24	Private Land	State Health Department/Planning Authority/Local Authority
20	L	L-13	*Val*	*Primary School*	*0.5*	*1pt, 2pt, 35pt, 40pt*	16.24	Private Land	Planning Authority/State Education Department
21	L	L-13	*Purne/Gundavali*	*Fire Station*	*0.3*	*Purne 46pt, Gundavali 81pt,82pt*	11.80	Private Land	Planning Authority/Local Authority
22	L	L-13	*Purne/Gundavali*	*Dispensary / Maternity Home*	*0.3*	*Purne 46pt, Gundavali 81pt.*	11.80	Private Land	Planning Authority/State Education Department
23	L	L-13	*Val*	*Play Ground*	*1.6*	*34pt, 35pt, 40pt*	16.24	Private Land	Planning Authority/Local Authority
24	L	L-13	*Val*	*Lake Beautification*	*1.7*	*39pt, 40pt, 41pt, 46pt, 47pt*	16.24	Private Land	Planning Authority/Local Authority
25	L	L-16	*Purne*	*Dispensary / Maternity Home*	*0.6*	*2pt, 103pt*	11.80	Private Land	State Health Department/Planning Authority/Local Authority
26	L	L-17	*Purne*	*Primary School*	*0.6*	*94pt, 95pt, 99pt,*	11.80	Private Land	Planning Authority/State Education Department
27	L	L-17	*Purne*	*Community Centre*	*0.3*	*94pt, 95pt, 99pt*	11.80	Private Land	Local Authority
28	L	L-17	*Purne*	*Playground*	*0.6*	*94pt, 99pt*	11.80	Private Land	Planning Authority/Local Authority
29	L	L-17	*Purne*	*Public Utility (Water Supply)*	*3*	*Xpt*	11.80	----	-----
30	L	L-18	*Kalher*	*Primary School*	*0.5*	*266pt,268pt, 269pt*	7.74	Private Land	Planning Authority/State Education Department
31	L	L-18	*Purne/ Kalher*	*Secondary School*	*1.5*	*Purne 93pt,94pt,116pt,Kalher 255pt,258Apt*	11.80	Private Land	Planning Authority/State Education Department

32	L	L-18	*Kalher*	*Dispensary / Maternity Home*	*0.2*	*266pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
33	L	L-18	*Purne /Kalher*	*Shopping Complex*	*1.5*	*Purne 94pt,116pt, Kalher 255pt,258pt*	11.80	Private Land	Local Authority
34	L	L-18	*Purne /Kalher*	*Vegetable market*	*0.5*	*Purne 116pt,117pt , Kalher 258Apt,Xpt.*	11.80	Private Land	Local Authority
35	L	L-20	*Kalher*	*Primary School*	*0.5*	*12pt, 23pt,*	7.74	Private Land	Planning Authority/State Education Department
36	L	L-20	*Kalher*	*Primary School*	*0.5*	*45pt, 46pt, 309pt*	7.74	Private Land	Planning Authority/State Education Department
37	L	L-20	*Kalher*	*Secondary School*	*1.16*	*14pt,46pt,49pt,50pt,51pt,53pt,54pt ,55pt*	7.74	Private Land	Planning Authority/State Education Department
38	L	L20	*Kalher*	*Secondary School*	*1.0*	*12pt,14pt,22pt,23pt*	7.74	Private Land	Planning Authority/State Education Department
39	L	L-20	*Kasheli*	*Lake Beautification*	*0.6*	*144pt,145pt ,146pt,297Apt, 194pt,217pt*	7.17	Private Land	Planning Authority/Local Authority
40	L	L-20	*Kalher*	*Lake Beautification*	*0.6*	*1pt, 2pt, 3pt, 6pt*	7.74	Private Land	Planning Authority/Local Authority
41	L	L-20	*Kalher*	*Community Centre*	*0.2*	*101Apt*	7.74	Private Land	Local Authority
42	L	L-20	*Kalher*	*Playground*	*0.8*	*46pt,48pt, 49pt, 50pt*	7.74	Private Land	Planning Authority/Local Authority
43	L	L-20	*Kasheli*	*Community Centre*	*0.3*	*196pt,197pt , 198pt*	7.17	Private & Govt. Land S. No. 198pt,	Local Authority
44	L	L-20	*Kalher*	*Dispensary / Maternity Home*	*0.3*	*46pt, 47pt, 49pt*	7.74	Private Land	State Health Department/Planning Authority/Local Authority
45	L	L-20	*Kasheli*	*Dispensary / Maternity Home*	*0.4*	*197pt,198pt , 199pt*	7.17	Private & Govt. Land S. No. 198pt,	State Health Department/Planning Authority/Local Authority
46	L	L-20	*Kalher*	*Post Office*	*0.2*	*14pt, 21pt*	7.74	Private Land	MMRDA
47	L	L-1	*Kasheli*	*Garden*	*45.4*	*48,97pt,103pt,106pt,107,109pt,110pt,111,112pt,217pt, 125pt., 97B, 104, 105, 93, 94, 95, 96, 98, 99, 100, 101, 102.103pt.*	7.17	Private Land	Planning Authority/Local Authority
Sector - M									
1	M	M-2	*Kopar*	*Primary School*	*0.5*	*12pt,14pt, 15pt*	12.32	Private Land	Planning Authority/State Education Department
2	M	M-2	*Purne*	*Community Centre*	*0.2*	*132pt*	11.80	Private Land	Local Authority
3	M	M-3	*Kalher*	*Cremation/ Burial Ground*	*0.7*	*191pt*	7.74	Private Land	Planning Authority/Local Authority
4	M	M-3	*Kalher*	*Sewerage Treatment Plant*	*2.0*	*192pt, 193*	7.74	Private Land	Planning Authority/Local Authority
5	M	M-3	*Kalher*	*Transport Facilities*	*7.9*	*194pt,195,196pt,204pt, 205pt,206pt ,207pt,208pt,209,210pt, 211,212,213pt,216pt,217pt, 218pt , 219pt,*	7.74	Private Land	State Transport Department/Planning Authority/Local Authority

6	M	M-4	*Kopar*	*Primary School*	*0.5*	*19pt,20pt, 23pt, 24pt, 65Apt*	12.32	Private & Govt. Land S. No. 65Apt,	Planning Authority/State Education Department
7	M	M-4	*Kopar*	*Secondary School*	*1*	*18pt, 19pt, 24pt,25pt, , 65Apt*	12.32	Private & Govt. Land S. No. 65Apt,	Planning Authority/State Education Department
8	M	M-4	*Kevani/ Rahanal*	*Dispensary / Maternity Home*	*0.2*	*Kevani 39pt, 40pt, Rahanal 26pt,*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
9	M	M-4	*Rahanal*	*Post Office*	*0.2*	*26pt*	12.30	Private Land	Postal Department
10	M	M-5	*Kopar*	*Dispensary / Maternity Home*	*0.2*	*1pt, 15pt, 66Apt*	12.32	Private Land	State Health Department/Planning Authority/Local Authority
11	M	M-5	*Kopar*	*Playground*	*0.4*	*14pt, 16pt*	12.32	Private Land	Planning Authority/Local Authority
12	M	M-6	*Rahanal*	*Dispensary / Maternity Home*	*0.4*	*8pt, 9pt, 21pt*	12.30	Private Land	State Health Department/Planning Authority/Local Authority
13	M	M-6	*Purne*	*Lake Beautification*	*0.3*	*145pt,146pt , 169pt, 170pt*	11.80	Private Land	Planning Authority/Local Authority
14	M	M-7	*Purne*	*Dispensary / Maternity Home*	*0.2*	*185pt,186pt*	11.80	Private Land	Planning Authority/State Education Department
15	M	M-8	*Rahanal*	*Lake Beautification*	*3.4*	*120pt,121pt , 122pt,151pt , 164pt, 176pt*	12.30	Private & Govt. Land S. No. 120pt	Planning Authority/Local Authority
16	M	M-6	*Rahanal*	*Parking*	*0.7*	*3pt, 98pt, 173pt*	12.30	Private Land	Planning Authority/Local Authority
17	M	M-2	*Kopar/ Purne*	*Lake Beautification*	*0.8*	*Kopar 1pt,2pt, 66Apt, Purne 128pt,129pt*	12.32	Private & Govt. Land S. No. 65Apt,	Planning Authority/Local Authority
Sector - N									
1	N	N-2	*Pimpalner*	*Proposed Regional Bus Stand*	*9.6*	*66pt,113pt, 114,115pt,132pt133,pt134pt,135pt, 136pt,137pt*	7.74	Private & Govt. Land S.No. 135pt,137pt,	State Transport Department/Planning Authority/Local Authority
2	N	N-2	*Pimpalner*	*Passenger Railway Station*	*6.1*	*66pt,67pt,68pt,69pt,70pt, 73pt, 113pt*	7.74	Private & Govt. Land S. No. 68pt,	Railway Department
3	N	N-3	*Pimpalner*	*Fire Station*	*1.1*	*69pt,71pt, 113pt*	7.74	Govt. Land	Planning Authority/Local Authority
4	N	N-3	*Pimpalner*	*Administrative Headquarter*	*2.0*	*71pt, 113pt*	7.74	Private & Govt. Land S. No. 71pt.	Planning Authority/Local Authority
5	N	N-4	*Pimpalner*	*Art Complex*	*2.7*	*91pt, 92pt*	7.74	Govt. Land	Planning Authority/Local Authority
6	N	N-7	*Pimpalas*	*Water Works*	*33.2*	*72pt,73pt,75pt,77pt,78pt,79pt,81pt,82pt,84pt,86pt,88pt,89pt,90pt,91, 92,93pt94pt,95pt,97,98pt,99pt,100pt,101, 102pt., 117pt, Xpt.*	3.22	Private Land	Planning Authority/Local Authority
7	N	N-8	*Ranjnoli Pimpalas Pimpalner*	*Playground*	*21.1*	Ranjnoli 52pt, 58pt, 100 Pimpalas 57pt, 58pt, 61pt, 62pt,	9.59	Private & Govt. Land S. No. 100pt.	Planning Authority/Local Authority

						63pt, 64pt, 65, 85pt, 86pt, 87pt, 88pt,98pt, 99pt100pt,102pt,103pt 106, 107, 108, 109pt, 111pt,117pt,118pt,442pt old, Pimpalner 117pt,120pt,122pt, 124pt,131pt			
8	N	N-2	*Pimpalner*	*Garden*	*3.2*	*130pt,131pt 132pt,133pt., 135pt*	7.74	Private land & Govt. Land 130pt,135pt	Planning Authority/Local Authority
9	N	N-2	*Pimpalas / Pimpalner*	*Garden*	*0.6*	*Pimpalas 44pt, Pimpalner 135pt,136, 139pt*	7.74	Govt. Land	Planning Authority/Local Authority
10	N	N-5	*Pimpalner*	*Lake Beautification*	*1.8*	*71pt, 109pt, 112pt,*	7.74	Private Land	Planning Authority/Local Authority
11	N	N-1	*Pimpalas / Pimpalner*	*Playground*	*2.9*	Pimpalas *44pt, Pimpalner 135pt,136, 139pt*	7.74	*Govt. Land*	*Planning Authority/Local Authority*

CHAPTER - XVI

HOUSING DEVELOPMENT

16.1 Proposed strategy

To facilitate promotion of housing including rental and affordable housing both, there are adequate provisions in three residential zones. R-1, R-2 and RH as described in **15.5.4.1** dealing with the residential land requirements proposed in various sectors.

Since BSNA is proposed to be developed as a metropolitan of 1.2 million population as the new emerging regional centre by 2028, with a review in 2021 after census of population, the new investments will generate a total of about 0.30 million direct employment and an equal number of indirect job opportunities considering 50 percent work participation ratio. Therefore, without private participation, accomplishing gigantic task of housing development for the anticipated population is not possible. The role of private sector has to be recognized and encouraged to wipe out the backlog of housing stock and to meet the future housing requirement. The private participation and investment, as measure of resource mobilization, are vital to provide affordable housing and rental housing for attaining quality of life as enshrined in the vision statement.

To promote general housing in BSNA both in public and in private sectors adequate provisions in the Development Control Regulations for building and development permissions have been made. The permissible FSI including premium are linked with the locational factor i.e. the width of the road the site abuts as explained in **15.5.4.1.**

16.2 Provisions of Rental Housing

Rental housing will be developed as per the notification of Government of Maharashtra, Ministry of Urban Development Department, issued on 25th August, 2009 under the provisions of the Maharashtra Regional and Town Planning Act, 1966 vide notification No.MMS/TPS – 1209/217/CR-275/09/UD-12 directing MMRDA to take necessary steps and as amended from time to time.

Provisions for rental housing have been made in Sector A (34.46 hectares), Sector I (11.76 hectares), Sector K (179.06 hectares) and Sector M (80.37 hectares). Thus, a total of 305.65 hectares of land in residential zones has been earmarked for development of Rental Housing in accordance with the Policy mentioned supra. This policy encourages both private sector and the public sector to develop Rental Housing. This policy, as amended from time to time, is integral part of the Development Control Regulations.

CHAPTER - XVII

TRANSPORT NETWORK (Map-2)

17.1 Proposals Duly Considered and Integrated

For efficient flow of traffic, both inter-city and intra-city, regional network proposals relating to BSNA are duly considered and integrated in the draft Development Plan (at **15.5.4.4.).** Some of these proposals are of CTS, MMRDA and Delhi-Mumbai Freight Corridor among others.

17.1.1 The Proposals

The proposals of CTS comprehensively explained in the study part of this draft Development Plan at **9.10** and the latest proposal of the MMRDA to develop Multi-modal Corridor from Alibag to Vasai **15.5.4.4.** Part of this Multi-modal Corridor that falls within BSNA has been extended (Freeway) upto village Vadpe where it meets NH 3 leading to Nasik. Its right-of-way is maintained as such throughout its length to act as outer ring.

The proposals of Suburban railways/Metro and the Monorail, which are at the stage of formalization, are subject to final approval of the competent authority. As far as Delhi-Mumbai Freight Corridor is concerned, it is the widening of existing railway track. Its right-of-way indicated on the draft Development Plan is based on the land acquisition notification.

17.2 Proposed Hierarchy and Nomenclature of roads

Emerging hierarchy of roads, nomenclature thereof, proposed interchanges, railway over-bridges, overpasses are resultant of the integration of multi-modal system adopted for BSNA as integral part of MMR. The alphabet 'M' has been assigned to denote motor road therefore, every road begins with M followed by a number and the right-of-way stated in Table 17.1 as under:

Table 17.1 BSNA: Description of Different Hierarchies of Roads and Right-of-Way

Sr. No.	Designation	Description	Right-of- Way in metres	
1.		• Old National Highway-3 through BNMC • NH-3 new alignment	• Existing	• Road Cross-Section of NHAI • Road Cross-Section of NHAI
2.		Existing State Highways and Major District Roads (MSH-4,SH-35 & MDR 42)	30	As per Road Cross-Section
3.	M1	Multi-Model Corridor and beyond upto village Vadpe	100	As per Road Cross-Section
4.	M2	Sector Dividing Roads	60	As per Road Cross-Section
5.	M3	Parallel to NH3 -New Alignment	45	As per Road Cross-Section
6.	M4	Sector Dividing Roads	30	As per Road Cross-Section

7.	M5	Sector dividing wherever depicted and Sector feeder	24	As per Road Cross-Section
8.	M6	Internal roads	18	As per Road Cross-Section
9.	M7	Internal roads	15	As per Road Cross-Section
	M8	Internal roads	12	As per Road Cross-Section
10	M9	Roads leading to Gaothans	09	As per Road Cross-Section

17.2.1 Railway over-bridges and Inter-changes (Refer to the Transport Network Plan (Map-2)

Based on the proposed land uses and the anticipated traffic that will be generated, proposed multimodal-corridor, suburban railways, monorail and the proposed road network in the draft Development Plan, the critical traffic conflict points have been identified (subject to detailed studies). To minimize the conflicts for smooth traffic operations at critical cross-junctions interchanges, overpasses, underpasses and railway over-bridges their numbers proposed are as under:

Table: 17.2 BSNA: Proposed Inter-change, Railway Over-bridges

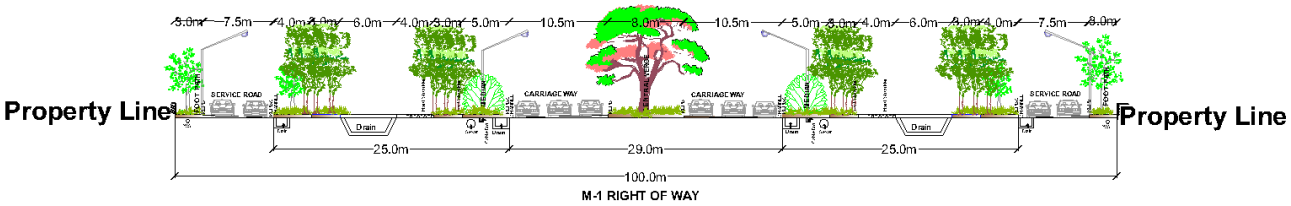
Sr. No.	Particulars	Length in Km/ No. of Units
1	Multi Modal Corridor (8 Lanes)	
	A (Motor Ways 8 Lanes)	11.5
	B (Railways)	11.5
2	Freeway (8 Lanes)	18.8
3	DMFC Corridor	10.5
4	Railway O B and OPS of Freeways (6 Lanes)	1.2
5	OPS of Shelar to Junandurkhi Road (4 Lanes)	1
6	RoB on DMFC Corridor (4 Lanes)	4
7	Cloverleaf on NH-3	3
8	Cloverleaf on old NH (NHAI Proposals)	1
9	Half Cloverleaf on Wada Road	2
10	Half Cloverleaf on MDR-42	1
11	Half Cloverleaf on 45 M Road (NH-3 to Arterial Road)	2
12	Half Cloverleaf on 45 M Road Parallel to NH-3	3
13	Half Cloverleaf on 45 M Road Parallel to Freeway	1
14	RoB on Sub-Urban Railways (4 Lanes)	3
15	OPS & RoB of MMC to Sub-Urban Railway (6 Lanes)	1
16	Mono Rail	19.5
17	River Bridges on Ullhas	3
18	River Bridges on Kamvadi	6
19	Construction of IRBT Sector J	39
	Grand Total*	

17.3 Road Cross-Sections

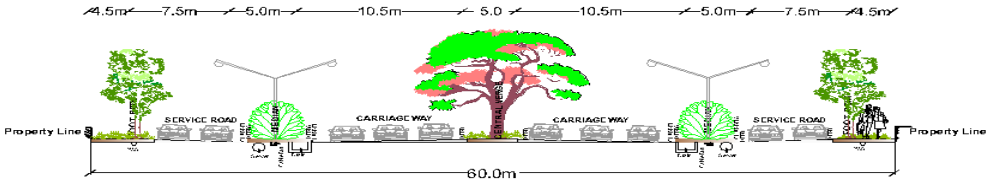
Keeping in view the proposed hierarchy, suggestive road cross-sections were worked out. While working out these road cross-sections, requirement of infrastructure that lay within the right-of-Way was also given consideration. Therefore, to facilitate laying of carriageways, plantation, electrification and other roadside infrastructure in the manner the local planning agency plans to lay or develop, suggestive road cross-sections have been drawn for various hierarchies of roads given as follows:

Figure : 17.1 Cross Section of Roads

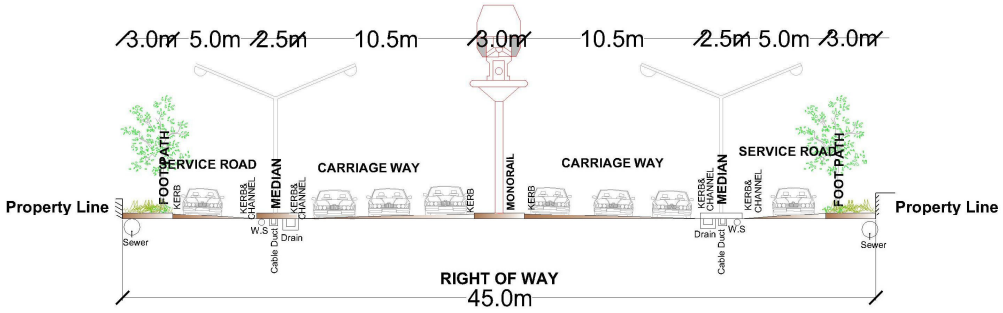
TYPICAL ROAD CROSS-SECTIONS



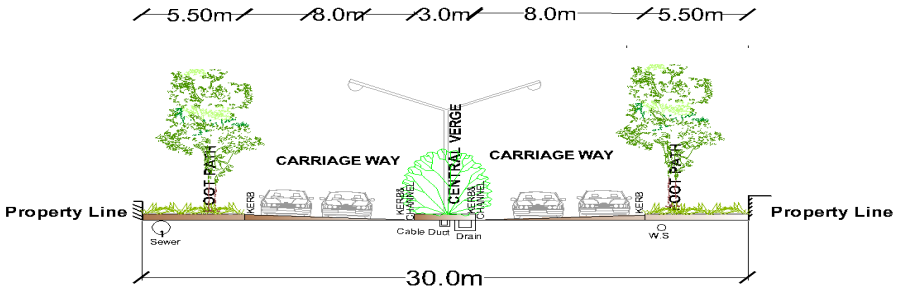
M-1 RIGHT OF WAY



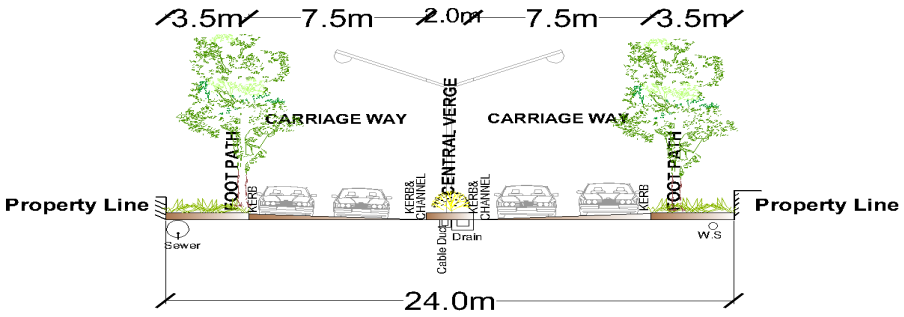
M-2 RIGHT OF WAY



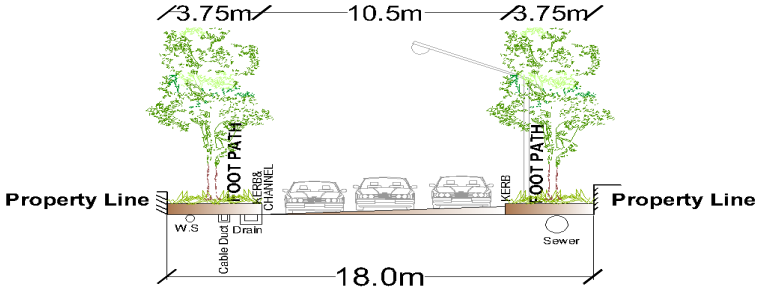
M-3 RIGHT OF WAY



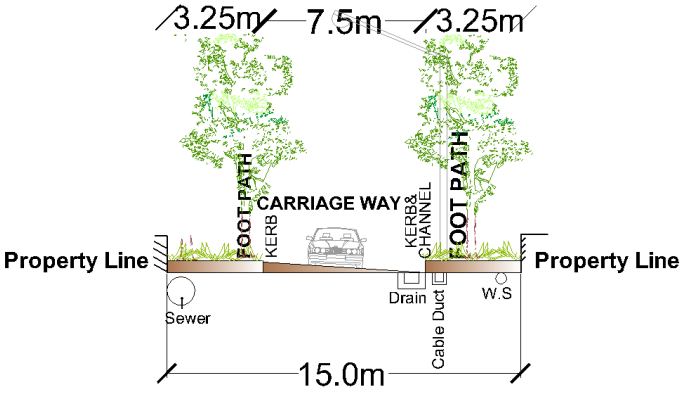
M-4 RIGHT-OF-WAY



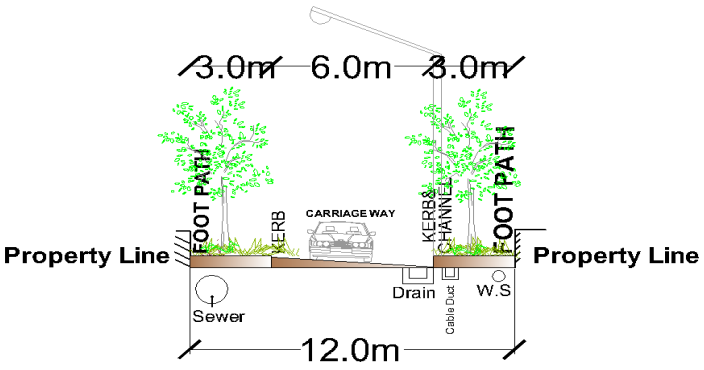
M-5 RIGHT-OF-WAY



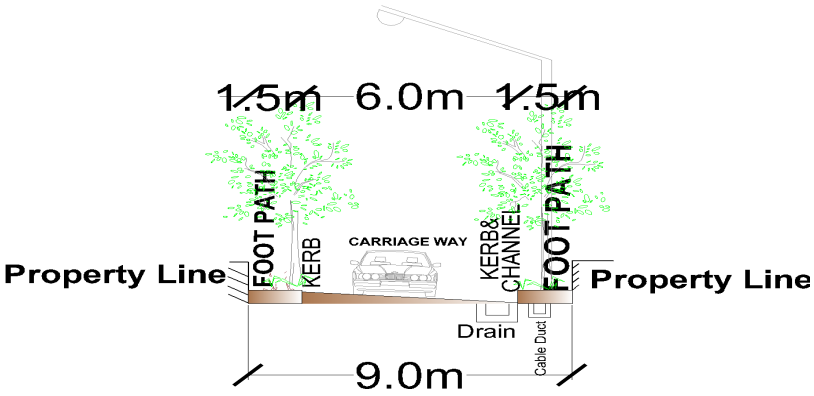
M-6 RIGHT-OF-WAY



M-7 RIGHT-OF-WAY



M-8 RIGHT-OF-WAY



M-9 RIGHT-OF-WAY

17.4 City Railway Station, Regional Bus Terminal and Integrated Rail-Bus Transit

In view of proposed suburban railway from Bhiwandi, a passenger railway station and the Regional Bus Terminal adjoining each other in village Pimpalner are proposed. The existing railway station in Bhiwandi is for freight and not for the passengers. This co-existence of rail-bus terminals close to the NH-3 will facilitate the smooth and quick evacuation of passengers. These will be of regional scale linking Kalyan, Thane, Vasai, by rail and Pune, Nasik, Vada, Vasai-Virar, Thane, and Navi Mumbai by bus. This proposal has been integrated with the proposal of Suburban railways. The integrated rail-bus transit (IRBT) services in sector J is also linked with suburban railway and the multi-modal corridor including to form a loop connecting the major work places.

17.5 Water Transportation

An attempt has been made to retain all the existing ferry sites along the Ulhas and Kamvadi rivers. Sufficient land is proposed for their expansion. It is proposed that these sites should be suitably developed and regulated to meet the navigational requirements and to fulfill the aspiration of the local people dependent on this activity.

CHAPTER - XVIII

Institutional Mechanism for Implementing the Development Plan

18. 0 Existing Setup

Since entire BSNA is outside the local municipal area, there is no urban local administration. The area is taken care of either by the Zila Parishad including Block Development Officer, the village Panchayats, MMRDA and the District Collector. For institutional arrangement, two-pronged mechanism is required. MMRDA, the notified Special Planning Agency managing BSNA is meagerly equipped. Keeping in view the enormity of the area, its diverse topography, coastal and forest ecology, the institutional arrangement suggested is as follows:

1. Strengthening the Sub-regional office of MMRDA,
2. Constituting a Local Body

18.1 Strengthening the Sub-regional office of MMRDA

The following factors call for strengthening of the sub-regional office:

i. Areal Expanse

BSNA spreads over about 14440.39 hectares. This is huge area in expanse. Therefore, special planning agency will be flooded with the suggestions and objections immediately after the publication of the Draft Development Plan. The supply of copies of the documents and the plans by MMRDA at the request of the stakeholders will be enormous generating extra workload for the already meagerly staffed sub-regional office.

ii. Processing of suggestions and objections

After the due date of filing suggestions and objections, the prime task will be processing, analyzing and framing a comprehensive report enabling decision-making. This requires both administrative visualization and technical skill to reflect aspirations of the civil society that was involved in the planning process for finalization and publication of the Development Plan.

iii. Development Permissions

With the publication of the Development Plan, MMRDA will be flooded with the development proposals for different land users. The processing of all the proposals and monitoring of permissions granted i.e. checking at various stages of development need additional skilled workforce.

iv. Development Control and Regularization of unauthorized Constructions

Immediately after the publication of the Development Plan, the important problem-solving exercise will be regularizing the unauthorized constructions

raised in BSNA. It is a stupendous task calling for policy framework in consonance with the proposals of the Development Plan and the Development Control Regulations.

v. Development Planning and Works

To give effect to the planning proposals, the development of infrastructure process will follow requiring engineering inputs for infrastructure development planning and construction.

vi. Land Acquisition

Framing the acquisition proposals of the lands required for various public purposes such as social and physical infrastructure including roads.

It is, therefore essential that three wings of MMRDA- Administration, Planning and Engineering need strengthening with its headquarters within BSNA.

18.2 Constituting a Local Body

Since MMRDA will be preoccupied with the development process and implementation thereof therefore, for municipal functions a separate urban local body is required for the following purposes:

i. Maintenance of the existing infrastructure and taking over the new infrastructure developed by various agencies;

ii. Upkeep of the new township such as general hygiene , street-lighting and raising funds through the tax regime to meet the expenses,

iii. Merging all the rural local bodies to end multiplicity and constituting an Urban Local Body to fulfill the requirement of 74th amendment of the Constitution of India,

iv. Urban Local Body may be responsible for implementing the local transport network that includes the metro-railways and IRBT also.

Since BSNA planned for a population of 12 Lakhs persons, it is therefore, proposed that a Municipal Corporation may be constituted to take care of the municipal functions of the BSNA.

Chapter - XIX

Project Financing, Implementation and Phasing Program

19.0 Introduction

Project costs and financing thereof form backbone of project implementation. It is prudent to mention that development of infrastructure is generally not a leveraged revenue component. Therefore, in development planning it is attempted to generate resources from various land components. In this chapter, an attempt is made to suggest resource generation for project implementation. The approach adopted is explained as follows.

19.1 Land Development

i. Since land is the base for every development therefore, the land acquisition cost is the primary component,
ii. The social and physical components of infrastructure i.e. various reservations

19.2 Infrastructure Development

Various infrastructure projects have been identified in the Development Plan categorized as under:

i. National/State Level
ii. State/Regional Level
iii. BSNA Level infrastructure i.e. Local level

i. National/State Level Infrastructure

The national/state level projects are:

a. Delhi-Mumbai Dedicated Freight Corridor along the existing railway line from Diva to Vasai and all the railway over-bridges/underpasses to this Freight Corridor linking different parts of BSNA and BSNA with BNMC;
b. Projects of the National Highway Authority of India (NHAI) within BSNA and all interchanges/ underpasses/overpasses to the National Highway and new alignments proposed by NHAI.

ii. State/Regional level Infrastructure

The Components are:

a. Multimodal Corridor with all interchanges/overpasses/underpasses throughout its length within BSNA;
b. Freeway with all interchanges/overpasses/underpasses throughout their lengths within BSNA;
c. Widening and strengthening of existing State Highways and major District Roads within BSNA;
d. Suburban railways with all railway over-bridges/underpasses throughout its length within BSNA;
e. Monorail with all railway over-bridges/underpasses throughout its length within BSNA;

f. Integrated Rail-Bus Transit (IRBT);

iii. BSNA Level infrastructure i.e. Local level

The components of local level infrastructure to be developed by the SPA are listed as follows:

a) All reservations in the Development plan;

b) All roads other than listed in **i** and **ii** above shown in the Development Plan

c) Infrastructure projects;

19.3 Acquisition of Land under Various Reservations

Since new ready reckoner was available for the year 2010, though all field surveys were completed in 2008 yet it was deemed appropriate to refer the current ready reckoner for assessing the land acquisition costs. The prices indicated in the ready reckoner for each village and the area of amenities in that village were taken note of. Where amenity is falling in two villages the value higher of the two was taken into consideration. The summary of land under various reservations and the costs thereof sector-wise are given in the table 19.1.

Table 19.1 Land Acquisition Cost at 2011 Ready Reckoner (Rs. In Lakhs)

Reservations	Notified Area (Ha.)	*Sectors (Area in Hectares)													
Amenities and Open Spaces		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Area of Amenities and Open Spaces	1255.91	52.37	173.84	28.48	34.95	42.43	67.3	79.76	94.5	72.15	385.97	77.69	73.06	6.51	66.9
On Public Land	110.71	1.5	10.52	9.4	6.7	4.3	1.8	6.9	-	3.3	50.3	-	0.8	4.5	10.69
On Private Land (to be Acquired)	1145.2	50.87	163.32	19.08	28.25	38.13	65.5	72.86	94.5	68.85	335.67	77.69	72.26	2.01	56.21
Sector-wise Average Cost	-	6.24	6.15	8.57	4.36	4.65	4.43	7.91	4.82	8.88	6.19	7.6	9.99	10.38	6.85
(A) Cost of Acquisition in Rs. Lakhs	7515.23	317.43	1004.42	163.52	123.17	177.30	290.17	576.32	455.49	611.39	2077.8	590.44	721.88	20.86	385.04
Area of Roads and Transport Facilities	1286.90	131.68	124.6	122.5	55.7	55.6	106.1	125.4	8.97	105.7	136.0	115.6	113.3	39.40	46.35
On Public Land	29.60	2.7	0.8	6.1	3.0	0.6	0.9	2.6	-	1.5	3.1	2.30	2.60	2.10	1.30
On Private Land (to be Acquired)	1257.30	128.98	123.8	116.4	52.7	55	105.2	122.8	8.97	104.2	132.9	113.30	110.7	37.3	45.05
Sector-wise Average Cost	-	6.24	6.15	8.57	4.36	4.65	4.43	7.91	4.82	8.88	6.19	7.6	9.99	10.38	6.85
(B) Cost of Acquisition in Rs. Lakhs	8940.59	804.84	761.37	997.55	229.77	255.75	466.04	971.35	43.24	925.3	822.65	861.08	1105.89	387.17	308.59
Total of A and B	16455.82	1122.27	1765.79	1161.07	352.94	433.05	756.21	1547.67	498.73	1536.69	2900.45	1451.52	1827.77	408.03	693.63

*Note: - For Calculations averaged costs of land for the villages falling in the respective sectors are taken into considerations as per ready reckoner 2011, refer to Table 15.13 of Chapter-15.

It is evident from Table 19.1 above that area involved in acquisition measures 2542.81 hectares. Out of the total, government land measures 140.31 hectares and the remaining major share is private land measuring 2402.50 hectares. The total cost of land acquisition worked out is Rs. 16455.82 lakhs (Rs.164.5582 Crores).

19.4 Development Costs

During field surveys, information was gathered through interactions and the development costs prevailing in the year 2008 were taken into consideration for working out the costs. These costs vary from Rs. 800 per square metre in the case of cremation/Burial grounds to Rs. 3500 in the

case of health facilities and the markets. The summary of costs facility-wise is given in the table 19.2 below:

Table 19.2 Development Costs

Facilities	Area in Hectares	Public Provision	Private Provision	Development by SPA Area/Cost	Development Cost Rs. In Lakhs
A. Educational					
Primary Schools	61.10	15.275	45.825	7.635/2500	1908.75
Secondary Schools	98.70	24.675	74.025	12.3375/2500	3084.37
Colleges	17.90	17.90	-------	4.00/2500	1000.00
Sub-total	**177.70**	**57.85**	**119.85**	**23.9727**	5993.12
B. Health					
Dispensaries/ Maternity Homes	24.01	6.00	18.01	6.00/3500	2100.00
General Hospitals	14.70	14.70	-----	6.00/3500	2100.00
Sub-total	**38.71**	**20.70**	**18.01**	**12.00**	**4200.00**
C. Socio-Cultural					
Community Centre and Club	4.37	1.09	3.28	0.545/3500	190.75
Library	5.29	2.645	2.645	1.32/3500	462.00
Town Hall	3.93	1.965	1.965	1.965/2500	491.25
Art Gallery /Museum	2.76	2.76	----	2.76/2500	690.00
Fire Station	9.35	9.35	-----	9.35/1500	1402.50
Police Station	6.18	6.18	-----	6.18/2500	1545.00
Post and Telegraph	3.95	3.95	----	3.95/2500	987.50
Telephone Exchange	0.55	0.55	----	0.55/2500	137.50
Bus Terminus	18.12	18.12	----	18.12/1500	2718.00
Vegetable/ Fish Market	55.17	27.58	27.58	13.80/3500	6580.00
Burial Ground	3.08	3.08	----	3.08/800	246.40
Sub Total					**15450.90**
Grand Total					**25644.02**
Water Supply	100.32				
Electricity	20.66				
Sewage Treatment Plant	7.69				
Solid Waste Management	209.00				

The above table reveals a total estimated development cost of Rs. 25644.02 lakhs (Rs.256.4402 Crores).

19.5 Resource Mobilization

The resource mobilization is required for the SPA to implement local level projects. Various tools for resource mobilization are available such as development of land and construction charges, granting additional premium of FSI/Additional Development Rights, sale of commercial sites in the vegetable market and the City Centre. The local enquiries revealed that the sites on the proposed projects in sectors J and N will sell comfortably at a reserve price of Rs. 6000 per square metre. Accordingly the receipts have been assessed. The out flow of monetary resources for land acquisition costs of amenities, open spaces and the roads have been taken into consideration as 50% of the total estimated costs **(***refer Table 19.1*) given in the table 19.3 below:

Table 19.3: Investment Capital Required – Outflow of Funds

Component of Capital Investment	Costs (Rs. In Lakhs)
1. Amenities and Open Spaces	
Acquisition (50% of the Acquisition Cost by Monetary Compensation)	3757.62
2. Development Cost	25644.02
Sub Total	**29401.64**
3. Roads etc.	
Acquisition (50% of the Acquisition Cost by Monetary Compensation)	**4470.29**
Road Development*	**15106.80**
Water Supply	**9906.90**
Sewerage Network	**6604.60**
Total Capital Investment	**65490.23 (say 654.23 Crores)**

**It excludes the development of Multi-Modal Corridor, Freeways and Proposals of NHAI = 313.80 (Hectares)*

In the case of road development, it was revealed during surveys that cost per hectare go upto Rs. 15.00 Lakhs whereas in the case of water supply and sewerage it is Rs. 7.50 lakhs and Rs. 5.00 lakhs, respectively. The same estimated costs have been assumed for assessing the costs of development of roads, water supply and the sewerage.

It is pertinent to mention here that the costs of the National/state level projects and the projects of state level/ regional magnitude as listed have not been taken into consideration for the development of BSNA as listed at 19.2 afore.

To meet the requirement of development funds the Inflow of funds from different resources is given the table 19.4 below:

19.5.1: Revenue from Development Charges at base FSI* sale of sites (Map-3)

Table 19.4 Expected revenue from Development Charges – BSNA*

Land Use	Area in Ha.	Rate of Land Development charges Rs./ Sqm as per Ready Reckoner 2011.	Land Dev. Charges (Rs in Cr.) (A)	Dev. Charges for Construction Rs/sqm. as per Ready Reckoner 2011.	Dev. Charges for Construction at Minimum FSI of 1.00 (Rs in Cr.) (B)	Expected Total Dev. Charges (A) + (B) (Rs. in Cr.)
Residential	**4049.88**	4	**16.20**	16	**64.79**	80.99
Commercial	**820.97**	8	**6.56**	32	**26.27**	32.83
Industrial	**2446.20**	6	**14.72**	24	**58.71**	73.43
					Grand Total	**187.25**

**Rates adopted here are as notified by the Government of Maharashtra No.TPS-1810/85/CR2118/2010/UD-13 Dated 1st March 2011. The rates of land values are expected to increase with the preparation of DP.*

19.5.2. Expected Revenue from Premium and Sale of Sites

i Proceeds from the sale of premium on FSI= **Rs. 170.76 Crore**

ii. Proceeds from the sale of Commercial Sites in City Centre and Vegetable Market= **1100.04 Cr**

iii***. Total Expected Revenue (19.5.1 and 19.5.2) Rs. 187.25+170.76+1100.04=1458.05 Crore***

It is clarified that sale rate for premium FSI is the same as taken for the land acquisition costs applicable to each village in the ready reckoner of year 2011.

The foregoing tables reveal anticipated outflow of funds to the tune of Rs. **654.23 Crores** and the anticipated resource mobilization is to the extent of **Rs. 1458.05 Crores.** Thus, SPA will be having sufficient resources **(Rs. 1458.05-654.23= 803.82 Crores)** at its disposal.

19.6 Phasing for Plan Implementation (Map-4)

Phased development and implementation program of the Development Plan for BSNA was evolved considering existing development scenario, vulnerability of the area to development and the resource mobilization. Accordingly, the priority has been assigned to various sectors or sub-divisions thereof. In delimiting the boundaries of each phase, care has been taken to have well defined phase-segments. BSNA has been divided into 4 phases each of 5 years explained as follows:

Phase 1

Table 19.5: Phase - 1 of DP Implementation

Phase - 1 of DP Implementation										
Village Name	**Sectors-wise Areas (Hectares)**									
Pimpalner, Pimpalas, Pimpalghar, Ranjanoli, Thakurgaon, Sonale Kasabe, Shivnagar, Saravali, Gove, Kon Gholgaon, Valshind, Elkunde, Gholgaon, Yavai, Gorsai, Bhinar, Savandhe, Dahyale, Khoni, Shelar, Katai, Kambe, Karivali, Kalwar, Rahanal, Dive Kevani, Kevani, Kopar, Kalher,Purne, Val, Kailashnagr, Kasheli, Dive Anjur, Anjur, Dapode, Gundavali,Ovali,Vehele, Sarang, Mankoli	**Components**	**C**	**D**	**G**	**H**	**I**	**J**	**L**	**M**	**N**
	Roads	158.18	110.88	86.41	6.10	27.2	25.6	133.62	57.45	58.08
	Amenities	11.71	22.38	34.24	0.2	6.56	196.95	22.69	6.15	39.11
	Open Spaces	21.2	12.59	30.69	`95.73	18.66	81.0	7.67	5.89	28.7
	Residential									
	R1	97.34	46.18	83.91		36.65		104.02		
	R2	166.52	235.88	82.05		53.40	18.64	235.22	80.37	
	RH					11.76				
	Commercial	4.56	5.34	26.34	13.63	55.82	35.70	143.17	97.43	128.17
	Industrial	552.22	100.70	619.96	200.90	60.15	53.48	582.88	115.3	

Table 19.5A: Phase –1 Amenities and Open Space Reservations

Phase –1 Amenities and Open Space Reservations	
Sectors	**Amenities and Open Spaces**
Sector – C	1-PS,2-PS,3-SS,4-SS,5-D/MH,6-PG,7-PG,8-G,9-PG,10-Lib,11-D/MH,12-G,13-D/MH,14-G,15-G,16-FS,17-D/MH,18-PG,19-LB,20-PS,21-PG,22-D/MH,23-PG,24-G,25-LB,26-D/MH,27-PS,28-FS,29-PG,30-LB,31-D/MH,32-PS,33-SS,34-CC,35-D/MH,36-PG,37-LB,38-PG
Sector – D	1-PS,2-PG,3-G,4-SS,5-D/MH,6-Lib,7-VM,8-PS,9-PG,10-VM,11-SS,12-PG,13-CC,14-D/MH,15-SC,16-PS,17-G,18-PS,19-FS,20-D/MH,21-PG,22-FS,23-PST,24-H,25-PO,26-PG,27-PS,28-SS,29-D/MH,30-PG,31-FM,32-SS,33-H,34-PG,35-G,36-VM,37-SC,38-PS,39-SS,40-D/MH,41-TH,42-PG,43-CB,44-STP,45-PG,46-D/MH,47-PG,48-PS,49-PS,50-SS
Sector – G	1-EL,2-G,3-WW,4-LB,5-H,6-G,7-PG,8-PG,9-D/MH,10-PS,11-SS,12-PG,13-PO,14-PG,15-PS,16-CB,17-PS,18-SS,19-D/MH,20-G,21-PG,22-FS,23-D/MH, 24-PS,25-SS,26-PS,27-D/MH,28-PG,29-G,30-G,31-G,32-G
Sector – H	1-LB,2-PG,3-G/GWR,4-WW,5-PG,6-D/MH
Sector – I	22-PS,23-D/MH,25-PS,26-SS,27-PG,28-PS,29-D/MH,70-PS,71-D/MH,75-SS,76-PG,77-VM,78-D/MH,79-PG,80-FS,81-G,82-LB,83-D/MH,84-G,85-G,86-G,87-G
Sector – J	1-G,2-PSP,3-G,4-PSP,26-D/MH,27-D/MH,28-PG,29-PSP,30-PS,31-D/MH,32-IRBT,55-PG,56-G,58-G,59-G,61-VWM, 62-VM,63-JF
Sector – L	2-FS,3-PST,4-PS,5-PS,6-Lake,7-SS,8-PU,9-PG,10-Fs,11-LB,12-D/MH,13-PG,14-PS,15-SS,16-D/MH,17-LB,18-TF,19-D/MH,20-PS,21-FS,22-D/MH,23-G,24-LB,25-D/MH,26-PS,27-CC,28-PG,29-PU,30-PS,31-SS,32-D/MH,33-SC,34-VM,35-PS,36-PS,37-SS,38-SS,39-LB,40-LB,41-CC,42-PG,43-CC,44-D/MH,45-D/MH,46-PO
Sector – M	1-PS,2-CC,3-CB,4-STP,5-TF,6-PS,7-SS,8-D/MH,9-PO,10-D/MH,11-PG,12-D/MH,13-LB,14-D/MH,15-LB,16-P,17-LB
Sector - N	1-PRB,2-PPR,3-FS,4-Adm/H,5-AC,6-WW,7-PG,8-G,9-G,10-LB,11-PG

In Phase I major resource generation commercial projects i.e. city centre sector N and the vegetable market in sector J have been taken together with other developments as listed in the table 19.5. Similar approach was adopted for other phases of development listed in the tables 19.6, Table 19.7, Table 19.8 as follows:

Phase 2

Table 19.6: Phase - 2 of DP Implementation

Phase - 2 of DP Implementation					
Village Name	**Sector-wise Areas (Hectares)**				
Kon, Gove, Pimpalghar, Pimpalner, Pimpalas,Vehele, Mankoli, Sarang, Surai, Bharodi, Anjur,Dive Anjur, Rahanal, Kevani, Dive Kevani, Dunge, Kalwar, Vadghar, Vadunavghar, Karivali, kambe,Katai, Junandurkhi	**Components**	**A**	**B**	**I**	**J**
	Roads	131.68	99.10	59.10	64.60
	Amenities	30.95	35.48	38.65	34.24
	Open Spaces	21.42	124.86	16.20	70.34
	Residential				
	R1	27.48	12.48	308.91	200.30
	R2	255.01	327.03	124.90	246.00
	RH	34.46	-	-	-
	Commercial	7.36	12.10	12.60	34.52
	Industrial	-	222.13	21.40	-

Table 19.6A: Phase –2 Amenities and Open Space Reservations

Phase – 2 Amenities and Open Spaces Reservations	
Sectors	**Amenities and Open Spaces**
Sector – A	1-PS,2-FS,3-PST,4-PG,5-PS,6-SS,7-PG,8-SC,9-SS,10-CC,11-PO,12-H,13-PG,14-PS,15-SS,16-D/MH,17-Lib,18-TH,19-PG,20-D/MH,21-PG,22-PS,23-SS,24-PG,25-PG,26-PS,27-SS,28-PS,29-PG,30-PS,31-D/MH,32-TH,33-PG,34-PS,35-CC,36-D/MH,37-LB,38-SS,39-PS,40-G,41-D/MH,42-G,43-BS,44-VM,45-SC,46-FS,47-PST,48-PS,49-G,50-PG,51-PS,52-SS,53-C,54-D/MH,55-H,56-Lib,57-SC,58-VM,59-PS,60-SS,61-PG,62-G,63-PG,64-PG,65-G,66-G,67-G,68-G
Sector – B	1-H,2-FS,3-PG,4-SS,5-SS,6-SS,7-PS,8-PS,9-PS,10-D/MH,11-G,12-LB,13-PG,14-VM,15-SC,16-D/MH,17-D/MH,18-PS,19-SS,20-CC,21-PST,22-LB,23-D/MH,24-Lib,25-SS,26-PG,27-PS,28-SC,29-VM,30-PS,31-G,32-G,33-PS,34-SS,35-PO,36-G,37-TH,38-SC,39-VM,40-PS,41-D/MH,42-G,43-PS,44-CC,45-D/MH,46-PG,47-PS,48-SS,49-H,50-C,51-PG,52-LB,53-PS,54-PG,55-SS,56-PG,57-EL,58-PG,59-D/MH,60-LB,61-SS,62-PG,63-VM,64-PS,65-CC,66-SC,67-D/MH,68-PS,69-SS,70-PG,92-PG,93-PG
Sector – I	1-PS,2-SS,3-PST,4-PG,5-D/MH,6-PO,7-PS,8-PS,9-FS,10-PS,11-SS,12-CC,13-D/MH,14-PG,15-C,16-VM,17-PS,18-SS,19-G,20-PS,21-SS,24-SC,30-PS,31-CC,32-D/MH,33-PS,34-SS,35-FS,36-PG,37-PS,38-SS,39-PST,40-PO,41-H,42-G,43-PS,44-SS,45-Lib,46-TH,47-PS,48-PS,49-SS,50-H,51-D/MH,52-PG,53-Lib,54-PS,55-PG,56-VM,57-SC,58-CB,59-STP,60-G,61-JF,62-PS,63-SS,64-PG,65-G,66-SS,67-FM,68-PG,69-PG,72-SS,73-D/MH,74-D/MH,88-G
Sector – J	5-PSP,6-PS,7-SS,8-PSP,9-PS,10-SS,11-PST,12-D/MH,13-D/MH,14-PG,15-LB,16-G,17-RTZ,18-PS,19-PS,20-SS,21-CC,22-PG,23-D/MH,24-PS,25-PSP,33-PS,34-PG,35-SS,36-CC,37-D/MH,38-PS,39-SC,40-PS,41-PG,42-H,43-FM,44-PS,45-PS,46-SS,47-SS,48-SS,49-FS,50-Lib,51-PO,52-PG,53-CB,54-Garden,57-PG,62-VM,JF-63

Phase 3

Table 19.7: Phase - 3 of DP Implementation

Phase - 3 of DP Implementation			
Village Name	**Sector-wise Areas (Hectares)**		
Bharodi, Alimghar, Dive Anjur and Anjur, Yavai, Bhinar,Gorsai, Nimbavali, Dhamangaon, Kashivali, Vadpe	**Components**	**F**	**K**
	Roads	106.10	115.60
	Amenities	36.93	43.55
	Open Spaces	30.37	34.14
	Residential		
	R1	113.80	40.78
	R2	243.89	207.84
	RH	-	179.06

	Commercial	140.85	8.20
	Industrial	75.78	-

Table 19.7A: Phase –3 Amenities and Open Space Reservations

Phase – 3 Amenities and Open Spaces Reservations	
Sectors	**Amenities and Open Spaces**
Sector–F	1-PS,2-PG,3-SS,4-H,5-D/MH,6-PS,7-SS,8-PG,9-D/MH,10-PS,11-PG,12-SS,13-CC,14-PS,15-PG,16-PS,17-SS,18-D/MH,19-D/MH,20-L,21-C,22-PST,23-PO,24-Lib,25-PG,26-H,27-PO,28-PS,29-SS,30-PG,31-VM,32-SC,33-PST,34-TH,35-D/MH,36-SS,37-L,38-SS,39-SC,40-D/MH,41-PS,42-PG,43-FS,44-PST,45-PS,46-D/MH,47-WW,48-SS,49-PS,50-Parking,51-L,52-G,53-G,54-G,55-G,56-PG,57-G,58-G
Sector–K	1-PS,2-SS,3-D/MH,4-PG,5-PS,6-SS,7-LB,8-LB,9-C,10-FS,11-PST,12-Lib,13-PO,14-H,15-TE,16-TH,17-SC,18-SS,19-SS,20-CC,21-LB,22-PS,23-PS,24-SS,25-D/MH,26-D/MH,27-LB,28-SC,29-PS,30-PS,31-SS,32-SS,33-D/MH,34-SC,35-VM,36-PS,37-PG,38-PS,39-LB,40-PG,41-G,42-PG,43-G,44-PG,45-CB,46-JF,1-SS,47-G,48-PG

Phase 4

Table 19.8: Phase - 4 of DP Implementation

Phase - 4 of DP Implementation			
Village Name	**Sector-wise Areas (Hectares)**		
Gorsai, Borpada, Vaghivali, Kolhivali, Kawad Khurd, Sontakka, Rohini, Katai, Junandurkhi, Dahyale, Khoni, Tembhvali, Khoni, Shelar	**Components**	**B**	**E**
	Roads	25.50	55.60
	Amenities	8.00	26.13
	Open Spaces	5.50	16.30
	Residential		
	R1	155.10	14.00
	R2	-	270.70
	RH	-	-
	Commercial	2.00	4.70
	Industrial	-	47.20

Table 19.8A: Phase –4 Amenities and Open Space Reservations

Phase – 4 Amenities and Open Spaces Reservations	
Sectors	**Amenities and Open Spaces**
Sector – B	71-PS,72-SS,73-D/MH,74-FS,75-PST,76-PG,77-D/MH,78-Lib,79-H,80-PS,81-SS,82-PG,83-VM,84-SC,85-PS,86-SS,87-TH,88-PG,89-CC,90-PG,91-G
Sector – E	1-WW,2-G,3-PG,4-LB,5-PS,6-TH,7-PS,8-G,9-Lib,10-VM,11-PS,12-SS,13-SS,14-CC,15-D/MH,16-PG,17-SC,18-PO,19-PS,20-SS,21-SS,22-D/MH,23-PS,24-D/MH,25-PST,26-D/MH,27-PG,28-PG,29-SC,30-VM,31-PS,32-SS,33-VM,34-SS,35-D/MH,36-SC,37-PG,38-D/MH,39-G,40-PS,41-TH,42-G,43-PG,44-SS,45-D/MH,46-PG,47-G,48-LB

Note – PS-Primary School, SS-Secondary School, C-College, Lib-Library, TH-Town Hall, D/MH-Dispensary/Maternity Home, H-Hospital, CC-Community Centre, FS-Fire Station, PU-Public Utility, PO-Post Office, PST-Police Station, EL-Electric Sub-Station, TE-Telephone Exchange, WW-Water Works, SC-Shopping Complex, VM-Vegetables Market, FM-Fish Market, G-Garden, PG-Playground, L-Lake and Lake Beautification, CB-Cremation/Burial Ground, TF-Transport Facilities, JF-Jetties Ferries, IRBT-Integrated Rail-Bus Transit, PRB-Proposed Regional Bus Stand, PPR-Proposed Passenger Railway Station, BS-Bus Stand/Stop, PA-Parking, STP-Sewage Treatment Plant

Chapter - XX

SEWERAGE AND SOLID WASTE MANAGEMENT

20.0 Assessment Norms:

Bhiwandi-Nizampur Municipal Corporation has prepared the City Development Plan (CDP) dealing with Sewerage and Solid Waste Management comprehensively. This document is based on the national standards adopted for assessing both liquid and solid waste generated by urban areas like Bhiwandi. In the CDP assessment of sewage is assumed 80% of water supply @ 175 L/PCD and solid waste is assumed 0.5 kg per capita-day. The same norms have been considered appropriate for BSNA.

20.1 Sewage Quantification

Since resultant sewage is 80% of the water supply, therefore assessment of water supply is the prerequisite of sewage quantification.

20.1.2 Assessment of Water Requirement

BSNA cannot sustain on lone ground water resource for its water requirement. For assured and sustainable water supply, it has to out-source water from the dam sites built in the upper reaches of the rivers as already adopted for other urban centres of MMR. Water requirement projected @ 170 L/PCD, the sewage generated at this rate of water supply will be as in the table 20.1 below:

Table 20.1 BSNA Distribution of Projected Water Supply and Sewage Generation

Year	Projected Population	Projected Water Supply (MLD)@170 L/PCD	(80%) Projected Sewage Generation (MLD)
2011	2,28,840	38.90	31.12
2028	12,00,000	170	163.2

20.1.3 Assessment of Solid Waste

The quantification of solid waste generation in BSNA @ 0.5 kg per capita day is given in the table 20.2 below:

Table 20.2 BSNA: Solid Waste Quantification

Year	Population (In Lakhs)	Generation Rate (kg/capita/day)	Solid Waste (in Metric Tons)
2011	228,840	0.5	114.42
2028	12,00,000	0.5	600.00

Table 20.2 reveals that about 600 metric tons solid waste will be generated in BSNA. Both BNMC and BSNA will together generate solid waste about 1550 metric tons.

Since entire future urbanization surrounds BNMC and the undulating surface configuration forming five drainage zones, demand integration of sewerage network of BSNA with the system of BNMC. To meet the combine requirement of BSNA and BNMC sites for solid waste management/sewerage/effluent treatment plants have been earmarked.

20.2 Proposed Solid Waste Management - Privatizing Collection

a. BNMC has privatized solid waste collection from door to door, its transportation and disposal. It has provided the landfill site and the compost site. The private contractor carries out all activities under the purview of the Solid Waste (Management and Handling) Rules 2000. The Contractor is paid Rs. 60 Lakhs per month and the contract period extends to 10 years from 2006 onwards. Adopting this practice of privatization for BSNA is proposed. If clubbed with BNMC will be cost effective.

b. Existing dumping site of BNMC in Katai village of BSNA measures about 5 hectares. This dumping ground reported inadequate in area than is required for the quantity of solid waste generated. The spillover of solid waste is dangerous to the health of local residents in the vicinity therefore its shifting is required.

c. A site of 65 acre acquired by BNMC for Landfill is in village Dapode of BSNA. Its reported capacity is approximately 45 Metric Tons per day. This site is in the middle of proposed urbanization therefore, its shifting is required.

d. Solid waste must be segregated at source and further at the Dumping or the processing site.

e. If clubbed with BNMC the possibility of manure plant can be explored for biodegradable material in view of larger share and quantity of vegetable waste and the rural area around.

f. A joint effort of MMRDA and the BNMC is required to shift both the sites (from village Katai and Dapode) to locations shown in the Draft Development Plan of BSNA. Keeping in view the future urbanization and the proposals of the Development Plan a Vermi Composting at the new dumping yard should be adopted.

20.3 Land Assessment of Solid Waste

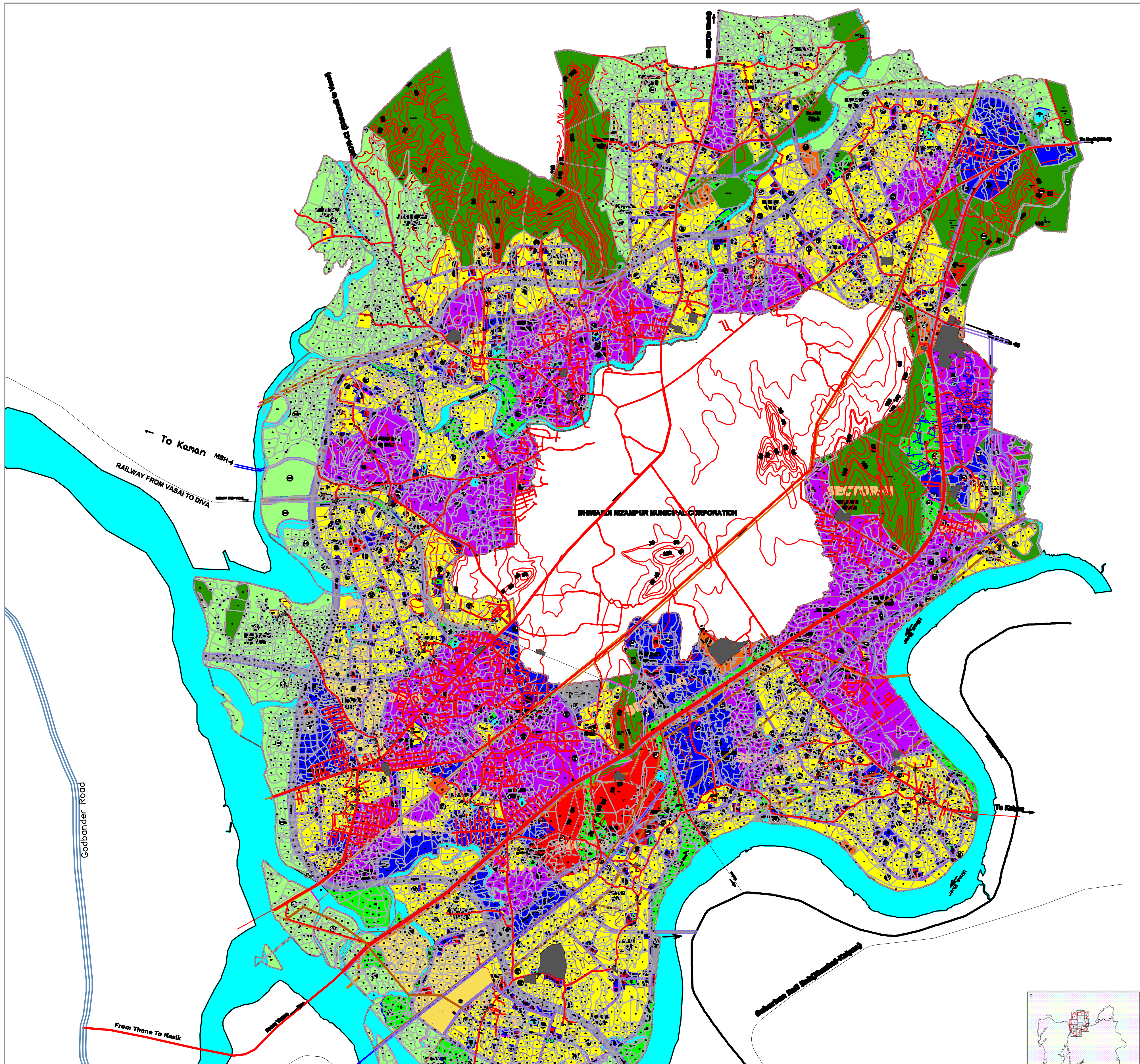
Land requirement assessment depends upon the type of solid generated, its compaction, sorting before dumping and the installation of compost plant. One method of assessing the land requirement can be derived from the book *"Solid Waste Handbook: a practical guide" by William D. Robin, 1986.* He has assessed the land

requirement per 10,000 persons on a formula given in the chapter dealing Land Disposal.

Two methods of landfill are given-area method and trench method. In trench method, land requirement is higher due to transport and other operational requirements. In area method, land requirement worked out is 1.8 acres upto a lift of 8ft. basing the land requirement on this method; BSNA requires a total area of about 88 hectares subject to the detailed project report.

DRAFT DEVELOPMENT PLAN 2008-2028 FOR BHIWANDI SURROUNDING NOTIFIED AREA PREPARED FOR MMRDA, MAHARASHTRA

भिवंडी परिसर अधिसुचित क्षेत्रासाठी प्रारुप विकास योजना: 2008 - 2028
मुंबई महानगर प्रदेश विकास प्राधिकरण महाराष्ट्र



Disclaimer:-

1- The Base Map, Existing Landuse and Proposed Landuse Map are Prepared on the Basis of Village Maps and the Satellite Imageries both of which are Prepared by Two Different Agencies and therefore some Inaccuracies May have Crept in the Maps in Spite of due Diligence taken While Preparing the Integrated Map of the Bhiwandi Surrounding Notified Area.
2- The area of Land and Details thereof Shall be Reckoned as per the Revenue Records.
3- Existing Structures Shown on map do not Indicate Status of Structures.

LEGEND - सूची

GENERAL - सर्वसाधारण

- BSNA BOUNDARY / भिपसअ हद्द
- BHIWANDI-NIZAMPUR CITY MUNICIPAL CORPORATION BOUNDARY / भिवंडी निजामपुर महानगरपालिका हद्द
- VILLAGE BOUNDARY / गावांची हद्द
- PLANNING SECTOR BOUNDARY / नियोजन सेक्टर हद्द
- RIVER, DRAINAGE CHANNELS / नदी/नाला
- EXISTING ROADS / अस्तित्वातील रस्ता
- OTHER WATER BODIES/PONDS / इतर जल स्थाने/तलाव
- M.I.D.C. BOUNDARY / म.औ.वि.म. हद्द
- GAOTHAN BOUNDARY / गावठाण हद्द
- SURVEY NOs./BOUNDARIES / सर्वे नंबर हद्द
- CONTOURS / समपातळी रेषा
- EXISTING PUBLIC SEMI-PUBLIC / अस्तित्वातील सार्वजनिक/निम-सार्वजनिक
- EXISTING PLAY GROUND / अस्तित्वातील खेळाचे मैदान
- EXISTING PUBLIC UTILITY / अस्तित्वातील सार्वजनिक सुविधा

PROPOSED TRANSPORTATION - प्रस्तावित दळण वळण

- EXISTING RAILWAY LINE / अस्तित्वातील रेल्वे लाईन
- EXISTING MAJOR ROADS / अस्तित्वातील प्रमुख रस्ता
- EXISTING CORRIDORS OF WATER PIPE LINES / अस्तित्वातील जलवाहिनी कॉरिडॉर
- CORRIDORS OF EXISTING HT POWER LINES / अस्तित्वातील उच्च दाब विद्युतवाहिन कॉरिडॉर
- PROPOSED FREIGHT CORRIDOR / प्रस्तावित रेल्वे कॉरिडॉर
- PROPOSED MULTI MODAL CORRIDOR-100 M / प्रस्तावित मल्टी मॉडल कॉरिडॉर - 100 मी.
- PROPOSED MONO RAIL / प्रस्तावित मोनो रेल
- PROPOSED RAIL LINK / प्रस्तावित रेल लिंक

PROPOSED LAND USE ZONES - प्रस्तावित जमीन वापर परिमंडळ

- RESIDENTIAL ZONE / रहिवास परिमंडळ
- RH — RENTAL HOUSING / भाडे तत्वावरील घर
- INDUSTRIAL ZONE / औद्योगिक परिमंडळ
- RIVERS/ESTUARIES/OTHER WATER BODIES / नदी/नाला/इतर जलस्थाने
- TRANSPORTATION & COMMUNICATION / दळणवळण व दुरध्वनी
- FOREST ZONE / वन परिमंडळ
- COMMERCIAL ZONE / वाणिज्य परिमंडळ
- NO DEVELOPMENT ZONE / ना विकास परिमंडळ
- PUBLIC SEMI-PUBLIC / सार्वजनिक/निम-सार्वजनिक
- PUBLIC UTILITIES / सार्वजनिक सुविधा

RESERVATIONS - आरक्षणे

- SS — SECONDARY SCHOOL / माध्यमिक शाळा
- PS — PRIMARY SCHOOL / प्राथमिक शाळा
- G — GARDEN / बगीचा
- C — COLLEGE / महाविद्यालय
- TH — TOWN HALL / नगर भवन
- EL — ELECTRIC SUB-STATION / विद्युत उपकेंद्र
- LIB — LIBRARY / ग्रंथालय
- SC — SHOPPING COMPLEX / दुकान केंद्र
- STP — SEWAGE TREATMENT PLANT / मलनिःसारण प्रकल्प
- VM — VEGETABLE MARKET / भाजी मंडई
- H — HOSPITAL / रुग्णालय
- D/MH — DISPENSARY/MATERNITY HOME / दवाखाना / प्रसुति गृह
- PST — POLICE STATION / पोलीस ठाणे
- PA — PARKING / वाहन तळ
- CB — CREMATION/BURIAL GROUND / स्मशानभूमी / दफनभूमी
- CC — COMMUNITY CENTRE / सामुदायिक केंद्र
- FS — FIRE STATION / अग्निशमन ठाणे
- PPR — PROPOSED PASSENGER RAILWAY STATION / प्रस्तावित रेल्वे स्थानक
- PG — PLAY GROUND / खेळाचे मैदान
- WW — WATER WORKS / जल स्थाने
- TF — TRANSPORTATION FACILITIES / परिवहन सेवा
- BS — BUS STAND/STOP / बस थांबा
- JF — JETTY/FERRY / धक्का
- IRBT — INTEGRATED RAIL_BUS TERMINUS / एकात्मीक रेल_बस अंतिम स्थानक
- FM — FISH MARKET / मासळी बाजार
- PO — POST OFFICE / टपाल कार्यालय
- PRB — PROPOSED REGIONAL BUS STAND / प्रस्तावित विभागीय बस स्थानक
- TE — TELEPHONE EXCHANGE / दुरध्वनी केंद्र

DRAWING TITLE:

PROPOSED LAND USE MAP
प्रस्तावित जमीन वापर नकाशा

SOURCE: BASE MAP & EXISTING LAND USE

Approved by:

Senior Planner, MMRDA वरिष्ठ नियोजक, मुं.म.प्र.वि.प्रा.	Chief, T & CP Devision प्रमुख, न.र.व.नि. विभाग	Additional Metropolitan Commissioner अति. महानगर आयुक्त	Metropolitan Commissioner महानगर आयुक्त	Drw.No.1 (आरेखन क्र.) BSNA-DP भिपसअ प्रा.वि.

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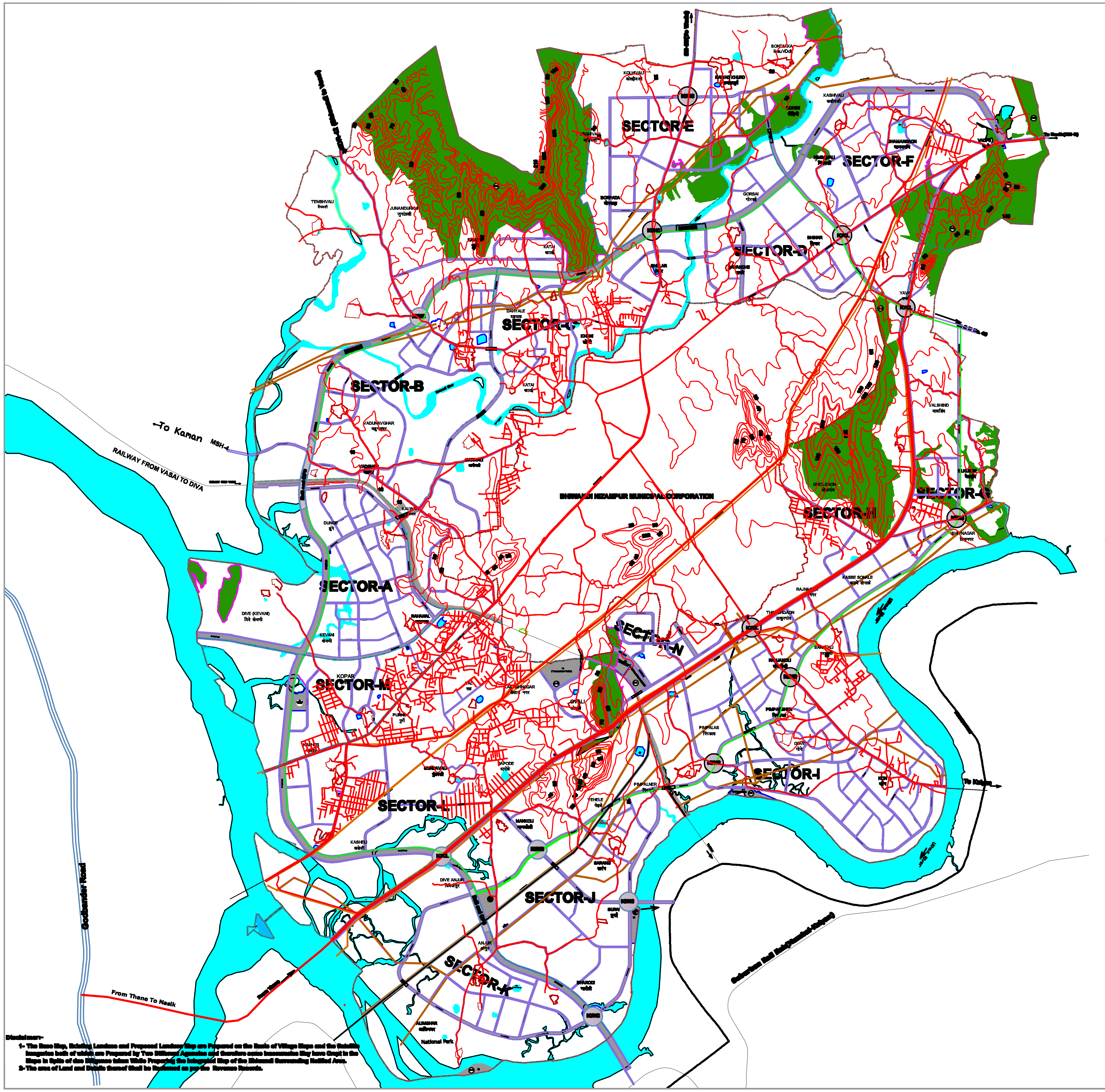
INSTITUTE FOR SPATIAL PLANNING AND ENVIRONMENT RESEARCH INDIA,PANCHKULA

C-1, AMRAVATI ENCLAVE, KALKA SHIMLA ROAD, PANCHKULA-134107(HARYANA)



DRAFT DEVELOPMENT PLAN 2008-2028 FOR BHIWANDI SURROUNDING NOTIFIED AREA PREPARED FOR MMRDA, MAHARASHTRA

भिवंडी परिसर अधिसुचित क्षेत्रासाठी प्रारुप विकास योजना: 2008 - 2028

मुंबई महानगर प्रदेश विकास प्राधिकरण महाराष्ट्र

LEGEND - सूची

GENERAL - सर्वसाधारण

BSNA BOUNDARY	BHIWANDI-NIZAMPUR CITY MUNICIPAL CORPORATION BOUNDARY भिवंडी निजामपुर महानगरपालिका हद्द
VILLAGE BOUNDARY	PLANNING SECTOR BOUNDARY
RIVER, DRAINAGE CHANNELS	M.I.D.C. Boundary
OTHER WATER BODIES/PONDS	SURVEY NOs./BOUNDARIES
GAOTHAN BOUNDARY गावठाण हद्द	
CONTOURS	

PROPOSED TRANSPORTATION - प्रस्तावित दळण वळण

EXISTING RAILWAY LINE	EXISTING MAJOR ROADS
EXISTING CORRIDORS OF WATER PIPE LINES	CORRIDORS OF EXISTING HT POWER LINES
PROPOSED FREIGHT CORRIDOR प्रस्तावित रेल्वे कॉरिडॉर	PROPOSED MULTI MODAL CORRIDOR-100 M प्रस्तावित मल्टी मॉडल कॉरिडॉर - 100 मी.
PROPOSED MONO RAIL	PROPOSED RAIL LINK

FOREST Zone वन परिमंडळ

RESERVATIONS - आरक्षणे

PA PARKING वाहन तळ	INTEGRATED RAIL_BUS ROUTE एकात्मीक रेल_बस
JF JETTY/FERRY धक्का	IC/CL INTERCHANGE WITH CLOVERLEAF
PPR PROPOSED PASSENGER RAILWAY STATION प्रस्तावित रेल्वे स्थानक	IC/HC INTERCHANGE WITH HALF CLOVERLEAF
TF TRANSPORTATION FACILITIES परिवहन सेवा	RoB RAIL OVER-BRIDGE
IRBT INTEGRATED RAIL_BUS TRANSIT एकात्मीक रेल_बस अंतिम स्थानक	RobOPS RAIL OVERBRIDGE AND OVERPASS
PRB PROPOSED REGIONAL BUS STAND	OPS OVER-PASS
OPS OVER PASSES	

DRAWING TITLE:

PROPOSED TRANSPORTATION MAP

प्रस्तावित दळन वळन नकाशा

SOURCE: BASE MAP & EXISTING LAND USE

Approved by:

Drw.No.2

BSNA-DP

NG Lakhanpal Strategic Management Services Pvt.Ltd.

Prepared By:

INSTITUTE FOR SPATIAL PLANNING AND ENVIRONMENT RESEARCH INDIA, PANCHKULA

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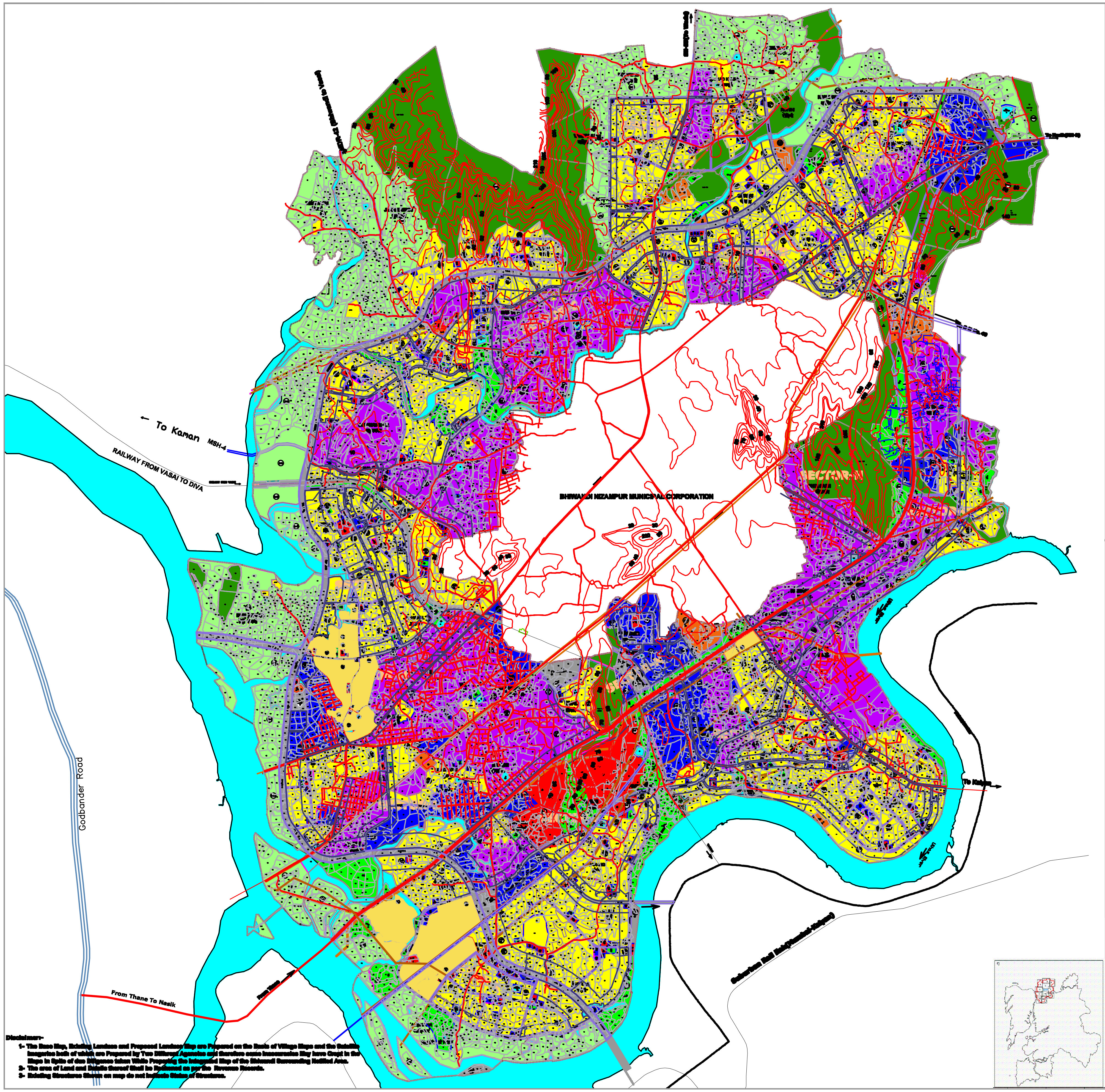

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मुंबई महानगर प्रदेश विकास प्राधिकरण महाराष्ट्र

LEGEND - सूची

GENERAL - सर्वसाधारण

- BSNA BOUNDARY / भिपअक्षे हद्द
- BHIWANDI-NIZAMPUR CITY MUNICIPAL CORPORATION BOUNDARY / भिवंडी निजामपुर महानगरपालिका हद्द
- VILLAGE BOUNDARY / गावांची हद्द
- PLANNING SECTOR BOUNDARY / नियोजन सेकटर हद्द
- RIVER, DRAINAGE CHANNELS / नदी/नाला
- EXISTING ROADS / अस्तित्वातील रस्ता
- OTHER WATER BODIES/PONDS / इतर जल स्याने/तलाव
- M.I.D.C. BOUNDARY / म.औ.वि.म. हद्द
- GAOTHAN BOUNDARY / गांवठाण हद्द
- SURVEY NOs./BOUNDARIES / सर्वे नंबर हद्द
- CONTOURS / समपातळी रेषा
- EXISTING PUBLIC SEMI-PUBLIC / अस्तित्वातील सार्वजनिक/निम-सार्वजनिक
- EXISTING PLAY GROUND / अस्तित्वातील खेळाचे मैदान
- EXISTING PUBLIC UTILITY / अस्तित्वातील सार्वजनिक सुविधा

PROPOSED TRANSPORTATION - प्रस्तावित दळन वळन

- EXISTING RAILWAY LINE / अस्तित्वातील रेल्वे लाईन
- EXISTING MAJOR ROADS / अस्तित्वातील प्रमुख रस्ता
- EXISTING CORRIDORS OF WATER PIPE LINES / अस्तित्वातील जलवाहिनी कॉरिडॉर
- CORRIDORS OF EXISTING HT POWER LINES / अस्तित्वातील उच्च दाब विद्युतलाईन कॉरिडॉर
- PROPOSED FREIGHT CORRIDOR / प्रस्तावित रेल्वे कॉरिडॉर
- PROPOSED MULTI MODAL CORRIDOR-100 M / प्रस्तावित मल्टी मॉडल कॉरिडॉर - 100 मी.
- PROPOSED MONO RAIL / प्रस्तावित मोनो रेल
- PROPOSED RAIL LINK / प्रस्तावित रेल लिंक

PROPOSED LAND USE ZONES - प्रस्तावित जमीन वापर परिमंडळ

- RESIDENTIAL ZONE / रहिवास परिमंडळ
- RH — RENTAL HOUSING / भाडे तत्वावरीलधर
- INDUSTRIAL ZONE / औद्योगिक परिमंडळ
- RIVERS/ESTUARIES/OTHER WATER BODIES / नदी/नाला/इतर जलस्थाने
- TRANSPORTATION & COMMUNICATION / दळनवळन व दुरध्वनी
- FOREST ZONE / वन परिमंडळ
- COMMERCIAL ZONE / वाणिज्य परिमंडळ
- NO DEVELOPMENT ZONE / ना विकास परिमंडळ
- PUBLIC SEMI-PUBLIC / सार्वजनिक/निम-सार्वजनिक
- PUBLIC UTILITIES / सार्वजनिक सुविधा

RESERVATIONS - आरक्षणे

- SS — SECONDARY SCHOOL / माध्यमिक शाळा
- PS — PRIMARY SCHOOL / प्राथमिक शाळा
- G — GARDEN / बगीचा
- C — COLLEGE / महाविद्यालय
- TH — TOWN HALL / नगर भवन
- EL — ELECTRIC SUB-STATION / विद्युत उपकेंद्र
- LIB — LIBRARY / ग्रंथालय
- SC — SHOPPING COMPLEX / दुकान केंद्र
- STP — SEWAGE TREATMENT PLANT / मलनि:स्सारण प्रकल्प
- VM — VEGETABLE MARKET / भाजी मंडई
- H — HOSPITAL / रुग्णालय
- D/MH — DISPENSARY/MATERNITY HOME / दवाखाना / प्रसुति गृह
- PST — POLICE STATION / पोलीस ठाणे
- PA — PARKING / वाहन तळ
- CB — CREMATION/BURIAL GROUND / स्मशानभूमी / दफनभूमी
- CC — COMMUNITY CENTRE / सामुदायिक केंद्र
- FS — FIRE STATION / अग्निशमन ठाणे
- PPR — PROPOSED PASSENGER RAILWAY STATION / प्रस्तावित रेल्वे स्थानक
- PG — PLAY GROUND / खेळाचे मैदान
- WW — WATER WORKS / जल स्थाने
- TF — TRANSPORTATION FACILITIES / परिवहन सेवा
- BS — BUS STAND/STOP / बस थांबा
- JF — JETTY/FERRY / धक्का
- IRBT — INTEGRATED RAIL_BUS TERMINUS / एकात्मीक रेल_बस अंतिम स्थानक
- FM — FISH MARKET / मासळी बाजार
- PO — POST OFFICE / टपाल कार्यालय
- PRB — PROPOSED REGIONAL BUS STAND / प्रस्तावित विभागीय बस स्थानक
- TE — TELEPHONE EXCHANGE / दुरध्वनी केंद्र

DRAWING TITLE:

BASE FSI - MAP

SOURCE: BASE MAP & EXISTING LAND USE

Approved by:

Senior Planner, MMRDA	Chief, T & CP Devision	Additional Metropolitan Commissioner	Metropolitan Commissioner	Drw.No.3 (आरेखन क्र.) BSNA-DP
वरिष्ठ नियोजक, मुं.म.प्र.वि.प्रा.	प्रमुख, न.र.बे.नि. विभाग	अति. महानगर आयुक्त	महानगर आयुक्त	भिपअक्षे प्रा.वि.

Date :- 25-05-2011

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NG Lakhanpal Strategic Management Services Pvt.Ltd.

Prepared By:

INSTITUTE FOR SPATIAL PLANNING AND ENVIRONMENT RESEARCH INDIA,PANCHKULA
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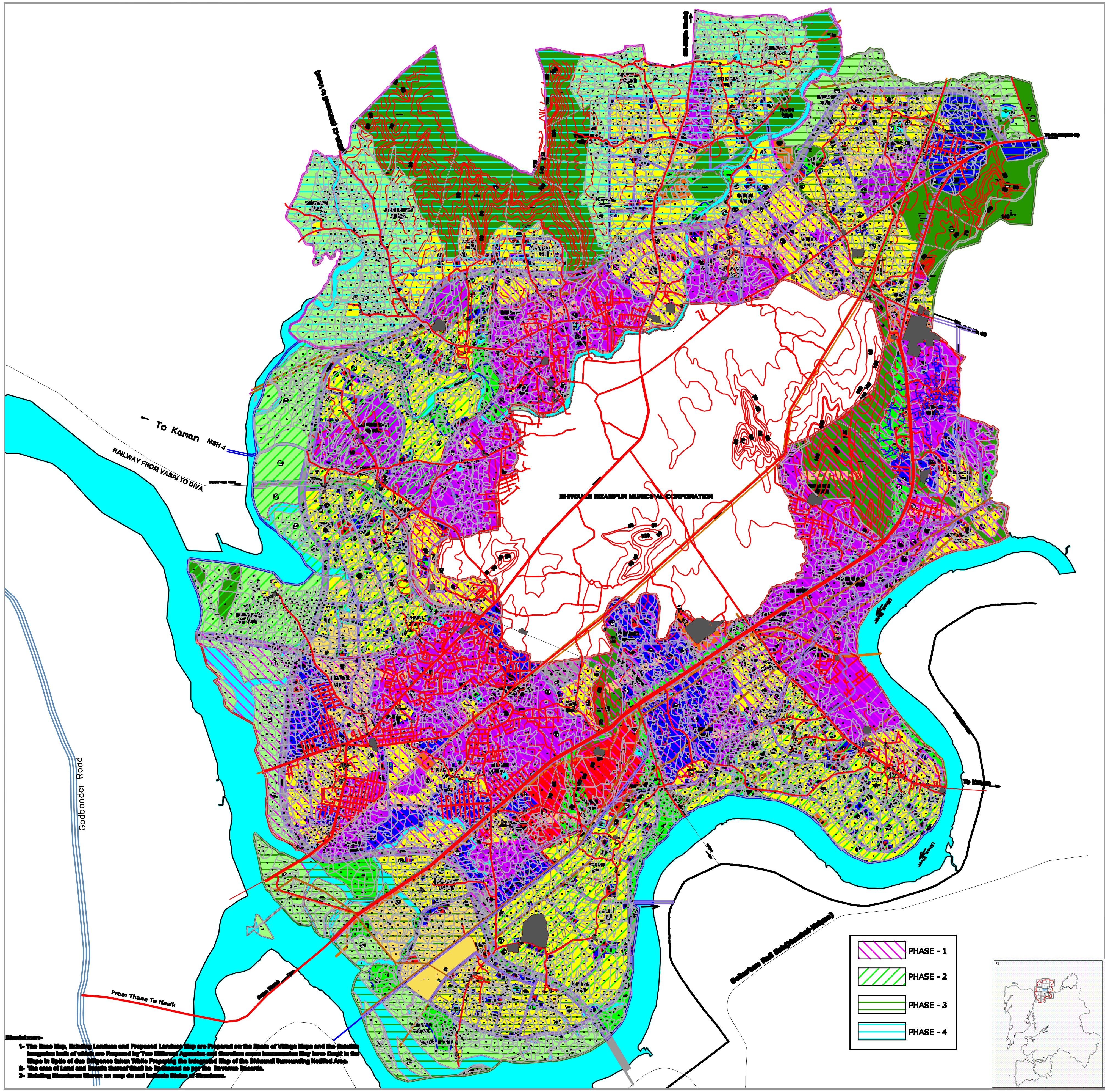

LEGEND - सूची

GENERAL - सर्वसाधारण

- BSNA BOUNDARY / भिपसअ हद्द
- BHIWANDI-NIZAMPUR CITY MUNICIPAL CORPORATION BOUNDARY / भिवंडी निजामपुर महानगरपालिका हद्द
- VILLAGE BOUNDARY / गावांची हद्द
- PLANNING SECTOR BOUNDARY / नियोजन सेक्टर हद्द
- RIVER, DRAINAGE CHANNELS / नदी/नाला
- EXISTING ROADS / अस्तित्वातील रस्ता
- OTHER WATER BODIES/PONDS / इतर जल स्थाने/तलाव
- M.I.D.C. BOUNDARY / म.औ.वि.म. हद्द
- GAOTHAN BOUNDARY / गावठाण हद्द
- SURVEY NOs./BOUNDARIES / सर्वे नंबर हद्द
- CONTOURS / समपातळी रेषा
- EXISTING PUBLIC SEMI-PUBLIC / अस्तित्वातील सार्वजनिक/निम-सार्वजनिक
- EXISTING PLAY GROUND / अस्तित्वातील खेळाचे मैदान
- EXISTING PUBLIC UTILITY / अस्तित्वातील सार्वजनिक सुविधा

PROPOSED TRANSPORTATION - प्रस्तावित दळण वळण

- EXISTING RAILWAY LINE / अस्तित्वातील रेल्वे लाईन
- EXISTING MAJOR ROADS / अस्तित्वातील प्रमुख रस्ता
- EXISTING CORRIDORS OF WATER PIPE LINES / अस्तित्वातील जलवाहिनी कॉरिडॉर
- CORRIDORS OF EXISTING HT POWER LINES / अस्तित्वातील उच्च दाब विद्युतवाहिन कॉरिडॉर
- PROPOSED FREIGHT CORRIDOR / प्रस्तावित रेल्वे कॉरिडॉर
- PROPOSED MULTI MODAL CORRIDOR-100 M / प्रस्तावित मल्टी मॉडल कॉरिडॉर - 100 मी.
- PROPOSED MONO RAIL / प्रस्तावित मोनो रेल
- PROPOSED RAIL LINK / प्रस्तावित रेल लिंक

PROPOSED LAND USE ZONES - प्रस्तावित जमीन वापर परिमंडळ

- RESIDENTIAL ZONE / रहिवास परिमंडळ
- RH: RENTAL HOUSING / भाडे तत्वावरीलघर
- INDUSTRIAL ZONE / औद्योगिक परिमंडळ
- RIVERS/ESTUARIES/OTHER WATER BODIES / नदी/नाला/इतर जलस्थाने
- TRANSPORTATION & COMMUNICATION / दळणवळण व दुरध्वनी
- FOREST ZONE / वन परिमंडळ
- COMMERCIAL ZONE / वाणिज्य परिमंडळ
- NO DEVELOPMENT ZONE / ना विकास परिमंडळ
- PUBLIC SEMI-PUBLIC / सार्वजनिक/निम-सार्वजनिक
- PUBLIC UTILITIES / सार्वजनिक सुविधा

RESERVATIONS - आरक्षणे

Code	Reservation	Code	Reservation	Code	Reservation
SS	SECONDARY SCHOOL / माध्यमिक शाळा	PS	PRIMARY SCHOOL / प्राथमिक शाळा	G	GARDEN / बगीचा
C	COLLEGE / महाविद्यालय	TH	TOWN HALL / नगर भवन	EL	ELECTRIC SUB-STATION / विद्युत उपकेंद्र
LIB	LIBRARY / ग्रंथालय	SC	SHOPPING COMPLEX / दुकान केंद्र	STP	SEWAGE TREATMENT PLANT / मलनि:स्सारण प्रकल्प
VM	VEGETABLE MARKET / भाजी मंडई	H	HOSPITAL / रुग्णालय	D/MH	DISPENSARY/MATERNITY HOME / दवाखाना / प्रसुति गृह
PST	POLICE STATION / पोलीस ठाणे	PA	PARKING / वाहन तळ	CB	CREMATION/BURIAL GROUND / स्मशानभूमी / दफनभूमी
CC	COMMUNITY CENTRE / सामुदायिक केंद्र	FS	FIRE STATION / अग्निशमन ठाणे	PPR	PROPOSED PASSENGER RAILWAY STATION / प्रस्तावित रेल्वे स्थानक
PG	PLAY GROUND / खेळाचे मैदान	WW	WATER WORKS / जल स्थाने	TF	TRANSPORTATION FACILITIES / परिवहन सेवा
BS	BUS STAND/STOP / बस थांबा	JF	JETTY/FERRY / धक्का	IRBT	INTEGRATED RAIL_BUS TERMINUS / एकात्मीक रेल_बस अंतिम स्थानक
FM	FISH MARKET / मासळी बाजार	PO	POST OFFICE / टपाल कार्यालय	PRB	PROPOSED REGIONAL BUS STAND / प्रस्तावित विभागीय बस स्थानक
TE	TELEPHONE EXCHANGE / दुरध्वनी केंद्र				

DRAWING TITLE:

PHASING - MAP

SOURCE: BASE MAP & EXISTING LAND USE

Approved by:

Senior Planner, MMRDA / वरिष्ठ नियोजक, मुं.म.प्र.वि.प्रा.	Chief, T & CP Devision / प्रमुख, न.र.वि.नि. विभाग	Additional Metropolitan Commissioner / अति. महानगर आयुक्त	Metropolitan Commissioner / महानगर आयुक्त	Drw.No.4 (आरेखन क्र.) BSNA-DP / भिपसअ प्रा.वि.

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