

# Part 1 Chapter 3

## Population Growth, Characteristics and Projections

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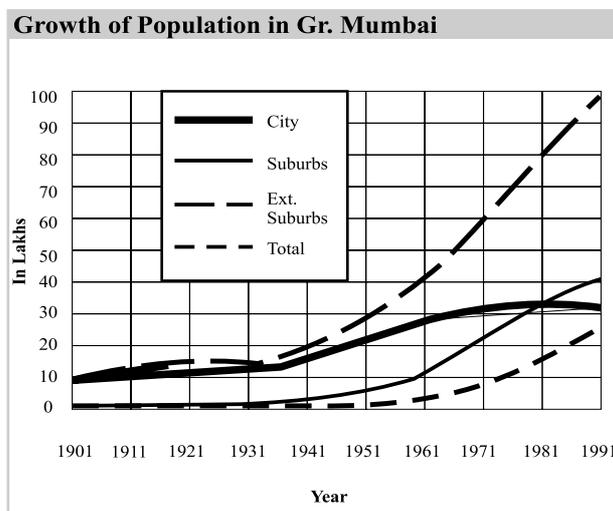
### 3.1 Introduction

- 3.1.1** The Regional Plan 1973, in tune with the then prevailing thinking, as reflected in the Fourth Five Year Plan, intended to restrict Greater Mumbai's population to 7.0 million by 1991 against the trend projection of 9.8 million. The Draft Sixth Five Year Plan (1978-83) also stated that "highest priority will be accorded to restricting growth of population in the larger urban conglomerates". This was intended to be achieved by banning new industries, offices, commercial establishments and centres of entertainment and culture in large cities. Efforts to shift Central and State Government offices, banks and other institutions to the less congested areas of the city were also recommended. The Plan further stated that "Unless fairly drastic measures of this kind are taken, there is a growing risk that in course of time all civic services will begin to break down and the quality of life will deteriorate further."
- 3.1.2** In a total reversal of the earlier stand, the Sixth Five Year Plan (1980-85) stated that urbanisation in India has grown at a relatively slow rate even during the preceding three decades and that the urbanisation pattern exhibited a very balanced size distribution of settlements. It further stated that "many of these (urban) problems are aggravated by a very low per capita income observed even in large cities." The Plan therefore did not suggest any policies directed at population size of cities per se but prescribed programmes such as slum improvement in place of slum relocation. In the Seventh Five Year Plan (1985-90) the process of urbanisation was, for the first time, viewed as a part of economic development and planning of urban development as a supportive activity of economic development at all levels. Strengthening this view further, the National Commission on Urbanisation (NCU, 1988) recognised the role being played by cities in economic development particularly by large cities like Mumbai and stated in this regard that "these cities have been the generators of national wealth and, if they were to collapse, the economy would receive a grievous body blow. Unfortunately, these four national cities (Mumbai, Calcutta, Delhi and Chennai) have come under very severe strain. The Commission feels that it is a matter of topmost national priority to not only save the national cities but to help them revive their economies."
- 3.1.3** This view is also in consonance with the new macro-economic policies being adopted in '90s. The thrust of these policies is on market orientation and minimal intervention. Strict controls on economic activities and population would therefore be contrary to general policy framework. Similarly, subsidies on various public services will have to be withdrawn and consequently pricing as a tool for conservation of national resources and public goods and mobilisation of financial reserves will have to be used.
- 3.1.4** The estimate of future population of MMR and its likely distribution over different sub-regions is an important input to the preparation of Regional Plan. A long term prediction of population, say over a period 15-20 years, is fraught with high degree of uncertainty on account of unforeseen factors. Such exercise is nevertheless essential as a broad framework for planning infrastructure projects like development of water resources, transport network and creation of new towns which have considerably long gestation period.

**3.1.5** The proposed Regional Plan is in continuation of the plan prepared for the period 1970-91. It is, therefore, appropriate to review the population estimates used in that plan and the actual growth observed in the last two decades.

## 3.2 Population Growth

**3.2.1** The data available from 1961 census formed major source for population projections at the time of preparation of the Regional Plan, 1973. Three population estimates were based on low, medium and high growth scenarios using different assumptions about birth rate, death rate, and migration volume. The medium growth scenario i.e. under the assumption of 5 percent reduction in rate of natural increase and net migration every five years from 1971 to 1991 was adopted. The population of MMR thus projected was 7.20 million for the year 1971, 9.58 million for 1981 and 12.46 million for 1991 and the expected population of Greater Mumbai for the corresponding years was 5.69 million, 7.57 million and 9.81 million respectively (BMRPB, 1974).

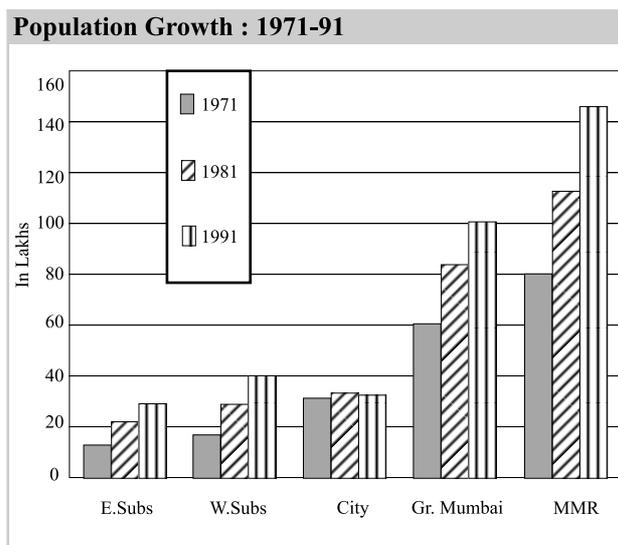


**Figure 3.1**

The population of MMR thus projected was 7.20 million for the year 1971, 9.58 million for 1981 and 12.46 million for 1991 and the expected population of Greater Mumbai for the corresponding years was 5.69 million, 7.57 million and 9.81 million respectively (BMRPB, 1974).

**3.2.2** These estimates turned out to be lower than the population actually recorded by the last three census rounds. The population of MMR was 7.79 million, 11.00 million and 14.53 million in 1971, 1981 and 1991 respectively and the corresponding figures for Greater Mumbai were 5.97 million, 8.24 million and 9.93 million. Except for the Island City, there has been a continuous growth in population of MMR, Greater Mumbai and its Eastern Suburbs and Western Suburbs as shown in Figure-3.2.

**3.2.3** The growth of population in Greater Mumbai from 1901 to 1991 is shown in Table-3.1 & Figure-3.1. It is observed that though the decadal growth and growth rate has varied considerably prior to 1941 due to a number of reasons, growth after 1941 has been more consistent. However, here too, significant deviations are observed during 1981-91. The annual growth rate during 1931-41 was 5.21 percent, for the following three decades it varied between 3.26 percent and 3.70 percent. But during the period from 1981 to 1991 it has significantly come down to 1.89 percent. In terms of absolute growth, the peak occurred during the interval 1971-81 when the growth was 2.26 million. The growth



**Figure 3.2**

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during 1981 to 1991 has been significantly less at 1.70 million. These trends are to be examined in light of the corresponding growth trends of Maharashtra and India of which Greater Mumbai is an integral part.

**3.2.4** Table-3.2 the growth of Greater Mumbai in the context of urban Maharashtra, Maharashtra, urban India and India is presented. It is to be noted that Maharashtra's total population has been about 9% of that of India except for the fact that in 1991 it has reduced to 9.33 percent from 9.54 percent in 1981. Growth of Greater Mumbai can be seen as a part of overall process of urbanisation. The proportion of urban population to total population of

<b>Greater Mumbai</b>				
<b>Year</b>	<b>City</b>	<b>Suburbs</b>	<b>Ext. Suburbs</b>	<b>Total</b>
1901	775,968	71,491	80,497	927,956
1911	979,445	82,042	87,270	1,148,757
1921	1,175,914	118,243	86,291	1,380,448
1931	1,161,383	141,132	95,297	1,397,812
1941	1,489,883	205,285	106,188	1,801,356
1951	2,329,020	510,250	155,174	2,994,444
1961	2,771,933	1,036,585	343,538	4,152,056
1971	3,070,378	2,166,864	733,333	5,970,575
1981	3,285,040	3,522,517	1,435,848	8,243,405
1991	3,174,889	4,167,681	2,583,321	9,925,891
<b>Population Distribution ( in % )</b>				
<b>1901</b>	<b>83.62</b>	<b>7.70</b>	<b>8.67</b>	<b>100.00</b>
1911	85.26	7.14	7.60	100.00
1921	85.18	8.57	6.25	100.00
1931	83.09	10.10	6.82	100.00
1941	82.71	11.40	5.89	100.00
1951	77.78	17.04	5.18	100.00
1961	66.76	24.97	8.27	100.00
1971	51.43	36.29	12.28	100.00
1981	39.85	42.73	17.42	100.00
1991	31.99	41.99	26.03	100.00
<b>Population Growth ( Annual Comp. Growth Rates % )</b>				
1901				
1911	2.36	1.39	0.81	2.16
1921	1.84	3.72	-0.11	1.85
1931	-0.12	1.79	1.00	0.13
1941	2.52	3.82	1.09	2.57
1951	4.57	9.53	3.87	5.21
1961	1.76	7.35	8.27	3.32
1971	1.03	7.65	7.88	3.70
1981	0.68	4.98	6.95	3.28
1991	-0.34	1.70	6.05	1.87
<b>Share in the Increment (%)</b>				
1901				
1911	92.15	4.78	3.07	100.00
1921	84.80	15.62	-0.42	100.00
1931	-83.68	131.82	51.87	100.00
1941	81.40	15.90	2.70	100.00
1951	70.33	25.56	4.11	100.00
1961	38.26	45.47	16.27	100.00
1971	16.41	62.15	21.43	100.00
1981	9.44	59.65	30.91	100.00
1991	-6.55	38.35	68.20	100.00

**Table - 3.1**

India has consistently increased from 14.29 percent in 1941 to 25.22 percent in 1991, but the increase during 1981-91 has been rather modest from 24.27 percent to 25.22 percent. Similar figures for urban population of Maharashtra show a more secular trend from 21.11 percent to 38.73 percent over 1941-91. In terms of growth rate, it is observed that growth rate of India's urban population has reduced from 3.89% per annum during 1971-81 to 2.91% per annum during 1981-91, but in case of Maharashtra such reduction in growth rate has been very modest - from 3.42% to 3.32% per annum. Another approach to examine the process of urbanisation is to observe the urban-rural growth differential (URGD). URGD for India has reduced from 2.16% in 1971-81 to 0.52% in 1981-91. Similar figures for Maharashtra are 1.79% and 1.63%. It could be generally concluded that the process of urbanisation has slowed during 1981 to 1991, but such a trend in Maharashtra is not as marked as in India.

**3.2.5** Municipal boundaries are man-made and urban growth is known to have spilled over into periphery. In case of Greater Mumbai, there have been deliberate

Population Shares (In Millions)						
Year	Gr. Mumbai	MMR Urban	Urban Maharashtra	Maharashtra	Urban India	India
1941	1.80	1.81	5.67	26.83	44.15	309.00
1951	2.99	3.31	9.20	32.00	62.45	350.00
1961	4.15	4.66	11.16	39.55	78.94	425.00
1971	5.97	6.83	15.71	50.41	109.10	529.00
1981	8.23	9.65	21.99	62.78	159.72	658.00
1991	9.93	13.45	30.50	78.75	212.87	844.00
Annual Growth Rates (%)						
Year	Gr. Mumbai	MMR Urban	Urban Maharashtra	Maharashtra	Urban India	India
1941	—	—	—	—	—	—
1951	5.21	6.22	4.96	1.78	3.53	1.25
1961	3.33	3.48	1.95	2.14	2.37	1.96
1971	3.70	3.90	3.48	2.46	3.29	2.21
1981	3.26	3.52	3.42	2.22	3.89	2.21
1991	1.90	3.38	3.33	2.29	2.91	2.52
Percentage Shares (%)						
Year	Urban India/	Urban Maharas/	Gr. Mumbai/ MMR	MMR Urban/ Urban	Urban Maharas/ Urban	Maharashtra/ India
1941	14.29	21.13	99.45	31.92	12.84	8.68
1951	17.84	28.75	90.33	35.98	14.73	9.14
1961	18.57	28.22	89.06	41.76	14.14	9.31
1971	20.62	31.16	87.41	43.48	14.40	9.53
1981	24.27	35.03	85.28	43.88	13.77	9.54
1991	25.22	38.73	73.83	44.10	14.33	9.33
Urban-Rural Growth Differential						
Year	Maharashtra (%)		URGD	India (%)		URGD
	Urban	Rural		Urban	Rural	
1941	—	—	—	—	—	—
1951	4.96	0.75	4.21	3.53	0.83	2.70
1961	1.95	2.22	-0.27	2.37	1.87	0.50
1971	3.48	2.03	1.45	3.29	1.95	1.34
1981	3.42	1.63	1.79	3.89	1.73	2.16
1991	3.33	1.69	1.64	2.91	2.39	0.52

Table-3.2

attempts to promote growth outside the municipal corporation boundary since 1970. It is therefore useful to observe the growth in the immediate hinterland of Greater Mumbai viz. MMR. In this regard it is seen from Table-3.2 that MMR does not show any significant break in the trend in 1991, either in terms of growth rate or share in Maharashtra's urban population.

- 3.2.6** In short, the population of MMR and Greater Mumbai has continued to grow in the last two decades and exceeded the target figures set in the Regional Plan, 1973.

### **3.3 Population Characteristics**

- 3.3.1** A survey was carried out with the help of Operations Research Group, Baroda, to study the household profile of MMR during 1989. The household survey covered 8085 urban and 1097 rural households on a sample basis. In 1991, the urban and rural population of MMR was 13.4 million (92%) and 1.1 million (8%) respectively. In addition, the survey also covered 2,000 samples from houseless and institutional population. Although the total sample was distributed over 39 zones covering the entire MMR area, the data collected in the survey is aggregated into 7 major urban and rural zones, each for the purposes of analysis (MMRDA & ORG, 1990). Major findings as reflected by the sample survey for urban and rural households are presented in the following.

#### **3.3.2 Urban Households**

##### **Demographic and Socio-Economic Profile**

The average household size in Urban MMR is 5.1 with a sex ratio of about 880 females per 1,000 males. About 60% of households have between 4 and 6 members while about 20% are single member households. Navi Mumbai has the lowest average household size of 4.3. The average number of married couples per household is 1.1.

Mother tongue of nearly 50% of the households is Marathi followed by Gujarati (15%), Hindi (9%) and Urdu (6%). Western suburbs of Mumbai display a highly cosmopolitan nature.

About 46% of the households are migrants. Of these, about 20% have settled in Mumbai during the past 10 years. Migrants with their origins in rural areas constitute about 65%. About 57% of the migrants are from outside Maharashtra.

Unemployment is not a serious problem. Only about 5% of the total work force is on the lookout for employment. The average number of earners per household is 1.7. Among all households the average income is Rs. 2,600 per month. Assuming a monthly income of Rs. 1,000 as the poverty level, about 23% of the households are in this category against 7% who have an income of over Rs. 5,000 per month. The income distribution is given in Table-3.3. Education is an important variable having a significant bearing on the income level of households.

The average monthly household expenditure is Rs. 2,036. About 61% of the expenditure excluding savings was on food followed by clothing (9%), transport (7%) and education (5%). Savings constituted 8% of the total expenditure. The distribution of household expenditure is given in Table-3.4.

## Health

Malaria is perceived as a major health-related problem. As regards other ailments, Gastro-intestinal disorder, pregnancy related and respiratory problems are acknowledged as the more common ones. The causes for the health problems are attributed to 'open drains' mosquito menace and to air pollution. Accumulated garbage is also perceived as an important factor leading to poor health.

Practice of immunisation by way of administering BCGs, Polio and DPT is widespread. In fact, in Thane and Mumbai all children are reported to have been immunised.

<b>Distribution of Households by Monthly Income (1989)</b>		
Monthly Income (in Rs.)	Percentage of Expenditure	
	Urban	Rural
UPTO 500	4.7	15.1
501-750	5.1	18.8
751-1000	13.1	17.9
1001-1500	19.7	22.3
1501-2500	26.7	16.8
2501-5000	23.5	6.6
5000 and above	6.9	2.5
<b>Total</b>	<b>100.0</b>	<b>100.0</b>
<b>Average</b>	<b>2600</b>	<b>1325</b>

Table-3.3

<b>Distribution of Household Expenditure (1989)</b>		
Monthly Income (in Rs.)	Percentage of Expenditure	
	Urban	Rural
Food	55.6	63.5
Clothing	8.9	8.4
Rent	3.6	0.6
Transport	7.1	11.5
Loan Repayment	1.9	1.6
Education	5.0	1.7
Entertainment	2.6	0.5
Remittance	1.5	1.0
Health	3.5	6.6
Savings	8.2	3.5
Durables	0.2	0.0
Others	1.9	0.4
<b>Total</b>	<b>100.0</b>	<b>100.0</b>
<b>Average</b>	<b>2036</b>	<b>1360</b>

Table-3.4

Most households go to private doctors for treatment in case of illness. However, low income households show a marked preference for Government or Institutional facilities mainly because of free medicine and treatment.

### **Transport and Recreation**

The average per capita trip rate is 0.95 per day. Wide zonal variations in the trip rates are observed. About half the trips are intra-zonal in nature implying a closer work place residence relationship.

Major modes of transport used are train and bus, together accounting for 87% of the total trips. Modes other than bus and train are used significantly by the higher income groups and mostly for purposes other than work. A large proportion of the trips by bus and train cost less than one rupee per trip. Transport facilities in general are found to be satisfactory by a majority of the households except in Kalyan and Navi Mumbai.

About 20% of the households visit picnic spots sometime or other in a year. The major spots preferred are beaches like Chowpati, Gorai - other places like parks and hill stations. Most households who visit such recreation spots did so only once during a year.

### **Housing**

About 86% of the houses are of pucca construction and the average age of housing stock is 32 years, as compared to 53 years in the Island City and 5 years in Navi Mumbai.

Average plinth area of houses is about 34 sq.m. per household. 59% houses had areas less than 30 sq.m., 20% between 30 sq.m. and 50 sq.m. and the remaining with areas more than 50 sq.m.

The distribution of houses by tenure shows that there are equal number of owners and tenants. As income increases proportion of ownership also increases.

A majority of households with income less than Rs. 2500 per month have at the most 2 rooms in their house.

About 25% of the households have undertaken some improvement/renovation in their houses. The cost of such improvement ranges from Rs. 4500 to Rs. 11200. Average cost of improvement works out to Rs. 9300.

78% of households reported not paying any property tax. Amongst the households paying property tax the average tax paid is Rs. 880 per annum. Tax paid is found to be inversely related to the age of the house. Household income also has a strong relationship with the quantum of tax paid.

Housing mobility is observed to be very high with about 60% of the households reporting at least one move so far. The move has invariably led to occupying a house with a larger area. Major reasons for such moves are shifting to own house and 'inadequate services at previous location'.

About 27% of all the households expressed a desire to own a house. The average area of house preferred was about 40 sq.m. for which the households expressed

willingness to pay a deposit of about Rs. 21,000. About 53% households were willing to pay a monthly installment of upto Rs. 300, 27% upto Rs. 500 and the remaining more than Rs. 500 per month.

### **Amenities**

Flats which is the predominant building type constituting about 42% of all buildings, are mostly catered through individual taps for water. Chawls (16%) and huts (30%) are being served mainly through standposts. Households reported that quantity of water supply was adequate. Water consumption through individual taps is around 80 litres per capita per day. Very few households have felt the need for augmenting the water supply.

About 44% of the households had individual toilets and another 34% use shared toilets. Large proportion of the toilets are served by sewer connections, except in smaller urban localities where septic tanks are predominant. Hutment dwellers do not have individual toilet facility, and they use public/shared toilets.

MMR is apparently short of schools, police stations and post offices. These three services were referred to as the ones in shortage or far below the needs.

## **3.3.3 Rural Households**

### **Demographic and Socio-Economic Profile**

The average household size in rural MMR is 5.3. There are minor variations amongst the different zones. The largest household size of 5.6 is in Bhiwandi Rural. The extent of single family households is only about 3%. As in urban, the sex ratio is 880 females per 1,000 males.

A little over half the Chief Wage Earners (CWE) are either illiterate or had no formal education. Education levels in general are very low, with only 12% of the CWE having completed H.Sc.

The proportion of CWE's employed full time is only 50%. The remaining generally work on piece rate basis. Agriculture is the major occupation for about 64% of the CWE's working in this sector.

Average monthly household income is observed to be Rs. 1325 per month which is about half of that observed for urban households. Major zonal variations are observed, with the lowest household income being in Pen-Alibag Region (Rs. 875) and the highest in Karjat-Khalapur Region (Rs. 1635). Around 52% of the households have an income of less than Rs. 1200 per month. Education level has a positive effect on the income level. There are, on an average, 1.8 earning members per household.

Food is the major item of expenditure, accounting for 64% of the total family expenditure. Another major expenditure is transportation (12%). Savings are found to account for about 14% of the earnings.

### **Health**

The health status is observed to be a matter of concern, with 89% of the household having reported sickness some time or other during the preceding month of survey.

Major illnesses reported are Malaria and Diarrhea and are attributed to prevalence of mosquito and poor quality of water.

While practice of immunising children with BCG and Polio are quite prevalent, other forms of immunisation are found to be practiced by very few households.

In the event of sickness, households generally prefer the services of private doctors (60%), followed by PHCs. However, no complaints on the inadequacy of medical facilities were made by the households.

### **Transport and Recreation**

Unlike their urban counterpart, the mobility of rural residents is much less. The per capita average trip rate is very low (0.38). Most of the trips are made to nearby places. Bombay island and its suburbs attract only 9% of all such trips from the rural areas. The major modes of transport are train and bus.

Only 6% of the households visited picnic spots during a year. Such spots generally are Matheran, National Park, Gorai Beach and Gateway of India. About 62% of those who go for picnics do so only once a year.

### **Housing**

About 61% of the houses are pucca. The lowest and the highest proportion of pucca construction is in Kalyan (36%) and Navi Mumbai (89%) respectively. The average age of housing stock is 26 years.

The average floor area of the house is 32 sq.m. and a majority of the houses (77%) have two rooms and less. Most of the houses are owner occupied, accounting for over 80 per cent of all houses.

About 35 percent of the households reported improving the house, at an average cost of Rs. 6400. Repairs to roof costing about Rs. 3000 and flooring improvements costing Rs. 12,500 were the minimum and maximum expenditure incurred.

About 12 percent of all the households expressed a desire to own a house. Average area desired is 35 sq.m. for which the households were willing to pay an initial deposit of Rs. 7,700 and a monthly installment of Rs. 140.

### **Amenities**

The major sources for water supply are wells (42%), hand pumps (10%) and stand posts (8%). Facility of individual taps is available to 8% of the households. About 24% of the households reported dissatisfaction with the quality of water. However, 51% reported adequacy of water supply round the year.

Availability of toilets is very low, with 87% using open space. Individual toilet facilities are available to only 5% of the households.

- 3.3.4** The above household characteristics show that although unemployment was not wide spread with 1.7 earning members per household, 23% of urban and 52% of rural households were below the poverty line. Marked deficiencies in various services were observed in case of urban households staying in huts and in case of rural households.

As for community facilities, schools, police stations and post offices were perceived to be in short supply by the urban households.

### **3.4 Methods of Population Projection**

- 3.4.1** A number of methods are available in literature for general population projections e.g. Cohort Survival method, Ratio method, Trend Extrapolation method, Urban Growth Rate Differential method, and so on. Each method has certain advantages and disadvantages and its use is primarily determined by the availability of data and the characteristics of area under study. Sometimes, a combination of two or more of these methods is also recommended.
- 3.4.2** The estimation procedures can be divided into two main categories. In the first category a city is assumed to have its own internal dynamics, largely insulated from the external forces. The trends observed in the past are therefore taken as indicators of the future. The statistical methods of curve fitting belong to this category. However, as noted earlier, due to marked changes in the trend observed in 1991, these methods are not considered appropriate for estimating population of Greater Mumbai. The procedures belonging to second category explicitly recognise that population growth of a city is a reflection of growth forces operating in the external world. The share of city's population in a larger region, as observed in the past, can be taken as an indicator of the future. Estimating population of larger areas like nations is relatively straightforward mainly because of minimal impact of migration. If such national forecasts are available it is possible to estimate the city's population in a step down or what is called as "ratio" method. In this exercise, the ratio method has been used to estimate the population of MMR and Greater Mumbai upto the year 2025 A.D.
- 3.4.3** Ratio Method: This proceeds on the assumption that the population of a given area depends upon the growth of the bigger area in which it is located. Thus, if the future population estimates of the larger area are available, then by examining the trend of past ratios of smaller area population to that of the bigger area, the required projections for the smaller area can be made. For this purpose, the rate of growth of ratio is used in projecting the ratio into the future under the geometric or exponential model assuming that the rate of growth of ratio will decline (in absolute value) to zero linearly in a period of 'n' years (Ramachandran, 1969).
- 3.4.4** In these projections, MMR is taken as a smaller area and Maharashtra as a larger one and further, India is taken as the larger area for Maharashtra. The first step is therefore to project the population of India for the future years. For this purpose, the growth rates derived from the expected birth and death rates are to be used. Obviously, these rates are governed by many factors, the success of family planning and health care programmes is chief among them. The Planning Commission while preparing the Eighth Five Year Plan (1992-97) assumed the growth rate of 1.81 percent during 1991-96, 1.65 percent during 1996-01, 1.52 percent during 2001-06, and 1.38 percent during 2006-11 (Planning Commission 1992). These rates appear to be on lower side and perhaps reflect the desired scenario. The United Nations on the other hand projected these vital rates upto year 2025 under high, medium and low growth scenarios and those are found to be more appropriate for this exercise [United Nations, 1992]. These rates are given in Table-3.5.

- 3.4.5 The ratio of population of Maharashtra to that of India in the year 1951, 1961, 1971, 1981 and 1991 and the corresponding ratios for the other areas are given in Table-3.6.
- 3.4.6 Using these projected vital statistics rates, the population of India has been computed upto 2031. By examining the trend of the share of past population of Maharashtra in India's population, the relevant ratios are computed and the future population of Maharashtra is estimated.
- 3.4.7 Similarly, using these projected figures of Maharashtra, the projections are made for MMR upto 2031. Further, by extending the same logic the population figures for Greater Mumbai are projected using these MMR projections. All these results under high, medium and low growth scenarios are presented in Table-3.7.

### 3.5 Population Projections

- 3.5.1 These estimated populations for MMR and Greater Mumbai, graphically presented in Figure-3.3 and Figure-3.4 respectively, indicate the likely trajectories under different assumptions. These Figures indicate that under the medium and low growth scenarios the population curve of MMR as well as of Greater Mumbai would approach a state of stability by the year 2025, whereas, under the high growth scenario the population would continue to rise due to the in-built momentum.
- 3.5.2 The projected population of MMR under the medium scenario is 19.5 million in the year 2001, 23.5 million in 2011 and 26.1 million in 2025 A.D. (Table-3.7). The compound growth rate per annum for MMR was 3.6 and 2.8 in 1971-81 and 1981-91 respectively. Under the Ratio method, it is projected to decline in steps of either 0.2 or 0.1 every

Projected vital rates for India										
Scenarios	Vital Rates	1985-90	1991-96	1996-01	2001-06	2006-11	2011-16	2016-21	2021-25	2025-31
High	BR	32.80	31.70	30.20	27.10	24.40	21.70	20.90	20.90	20.90
	DR	11.40	10.20	9.20	8.20	7.40	6.90	6.80	6.80	6.80
	GR	21.40	21.50	21.00	18.90	17.00	14.80	14.10	14.10	14.1
Medium	BR	32.00	31.00	28.20	25.30	22.50	19.80	17.00	17.00	17.00
	DR	11.30	10.20	9.00	8.10	7.40	7.00	7.00	7.00	7.00
	GR	20.70	20.80	19.20	17.20	15.10	12.80	10.00	10.00	10.00
Low	BR	31.30	28.20	25.60	22.90	20.10	17.00	13.60	12.70	12.70
	DR	11.20	9.90	8.90	8.10	7.50	7.10	7.00	7.30	7.30
	GR	20.10	18.30	16.70	14.80	12.60	9.90	6.60	5.40	5.40

Note : BR = Birth Rate (no./thousand)  
 DR = Death Rate (no./thousand)  
 GR = Growth Rate (no./thousand)

The rates upto the year 2001 are from Planning Commission, 1985.

Table - 3.5

Share of area-wise population in the past					
Region	1951	1961	1971	1981	1991
Maharashtra / India	0.09	0.09	0.09	0.09	0.09
MMR / Maharashtra	0.12	0.14	0.15	0.18	0.18
Gr. Mumbai / MMR	0.76	0.77	0.77	0.75	0.69
TMC / (MMR - Gr. Mumbai)	0.09	0.11	0.14	0.17	0.18
KMC / (MMR - Gr. Mumbai)	0.15	0.22	0.21	0.21	0.25

Table - 3.6

five year, hence to reach to 2.4 for the decade 1991-01 and to 1.96 in the period 2001-11. The population growth rate of Greater Mumbai, which was 3.30 in 1971-81 is also found to be declining to the values of 2.1, 0.9 and 0.7 by 2025 under high, medium and low growth assumptions respectively. These figures for the year 2001 are likely to be realisable and the further figures would be realised if that trend continues.

Projections by Ratio method		(In Thousands)								
Region	Vital Rates	1991	1996	2001	2006	2011	2016	2021	2025	2031
INDIA (Using the projected vital rates)	High	844324	939077	1041909	1144162	1244779	1339660	1436099	1540239	1651932
	Medium	844324	935863	1029223	1120834	1208051	1287371	1354381	1423468	1496079
	Low	844324	924459	1004273	1080822	1150652	1208748	124917	1283260	1318285
Maharashtra (by ratio method using projected pop. for India)	High	78748	88334	98538	108556	118220	127077	135759	144975	154072
	Medium	74728	88031	97339	106343	114732	122117	128034	133984	139536
	Low	74728	86959	94979	102547	109281	114659	118088	120787	12253
MMR (by ratio method using projected pop. of Maharashtra)	High	14534	17130	19721	22136	24247	25881	27104	28223	28436
	Medium	14534	17072	19481	21685	23532	24871	25561	26083	25753
	Low	14534	16864	19009	20911	22414	23352	23576	23514	22693
Gr. Mumbai (by ratio method using projected pop. of total MMR)	High	9925	11477	13028	14278	15299	15917	16376	16793	16919
	Medium	9925	11438	12869	13987	14848	15296	15444	15519	15323
	Low	9925	11299	12557	13488	14143	14361	14245	13991	13502

Table-3.7

3.5.3 The present part of the exercise, therefore, suggests an overall population projection of MMR by the year 2011 to range from 22.4 million to 24.2 million.

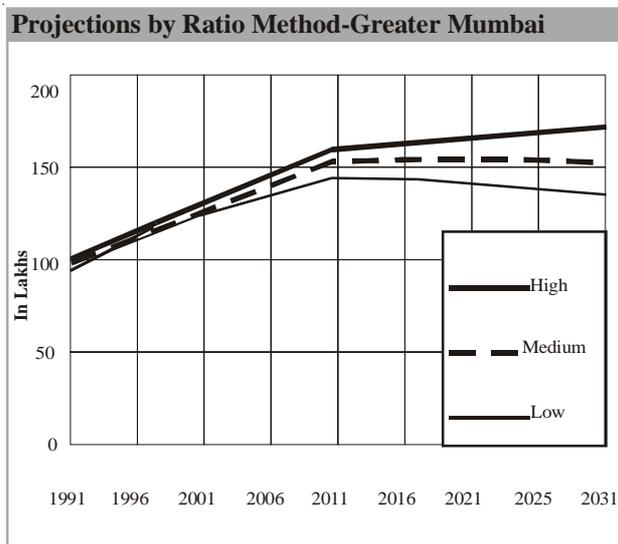


Figure 3.3

### 3.6 Population Distribution

3.6.1 The future population for MMR and Greater Mumbai is expected to vary between those obtained under high and medium growth scenarios. For the purpose of determining population distribution, these estimates can be taken as guiding figures. Based on the existing settlement pattern, planning and administrative convenience and transport linkages, MMR has been divided in eight sub-regions as given below:

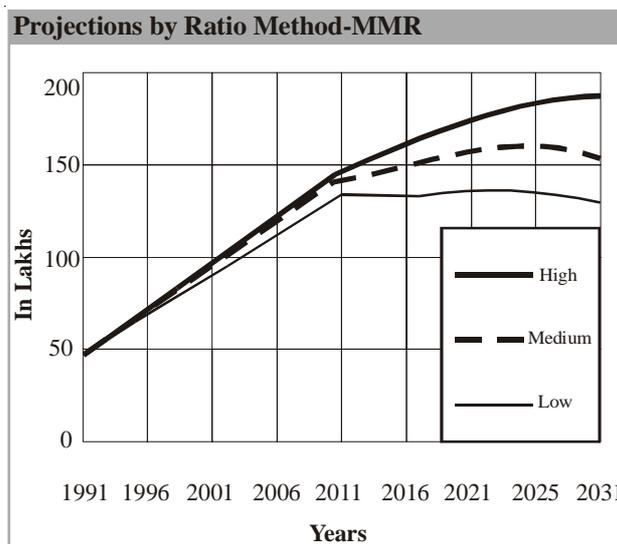


Figure 3.4

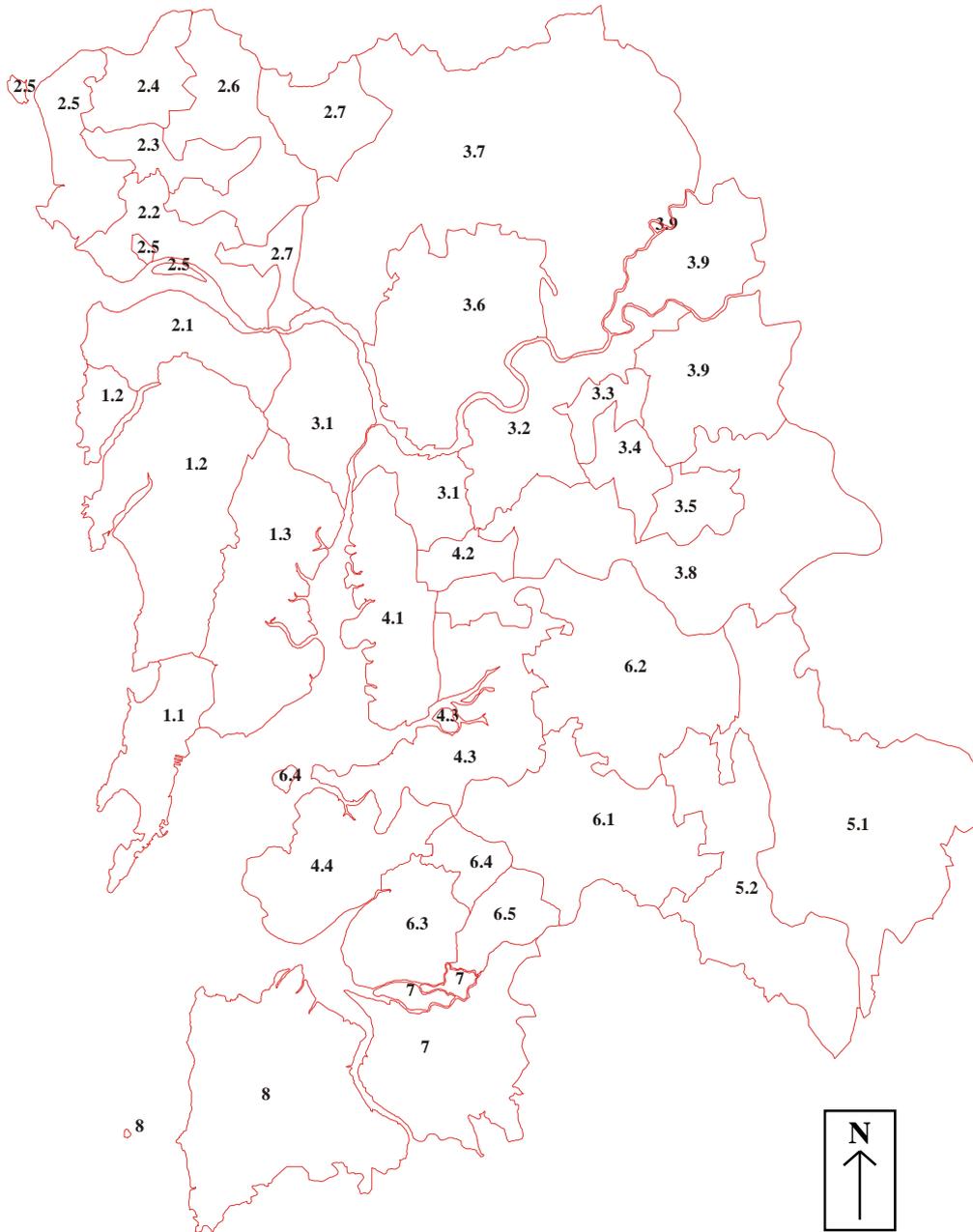
- |                        |   |
|------------------------|---|
| 1. Greater Mumbai      | Island city, western suburbs, eastern suburbs.  |
| 2. Western Region      | Mira-Bhayander, Vasai-Navghar, Nallasopara, Virar, Vasai-Virar Notified Area (VAVINA) coastal part, Vasai-Virar Notified Area rural part, remaining area of Vasai tehsil. |
| 3. North-East Region   | Thane Municipal Corporation (TMC), Kalyan Municipal Corporation (KMC), Ulhasnagar, Ambernath, Badlapur, Bhiwandi, Bhiwandi Rural, South Kalyan & North Kalyan.            |
| 4. Navi Mumbai Region  | Navi Mumbai Municipal Corporation (excluding 15 villages), NMMC (15 villages), Panvel, Uran.  |
| 5. Neral Karjat Region | Neral, Khalapur   |
| 6. Panvel-Uran Region  | Uran (outside Navi Mumbai), Rasayani, Panvel rest of Panvel, Khopta, rest of Uran and Karnala   |
| 7. Pen Region          | Pen   |
| 8. Alibag Region       | Alibag  |

3.6.2 Figure-3.5 shows the above sub-regions.

3.6.3 The distribution of population in these sub-regions upto the year 2011 is made by taking into account the development potential, land availability, accessibility and density level factors. The future distribution of population in the various sub-regions is given in Table-3.8. It can be seen that the population of Greater Mumbai is expected to be 11.4 million in 2001 and increasing upto 12.9 million by 2011. The island city portion which is already showing a sign of decline during 1981-91, is expected to further decline and would have population of 2.82 million in 2011. Both the western and eastern suburbs are expected to grow at the rate of 2.25% and 1.83% during the next two decades.

3.6.4 The western sub-region is expected to grow at a very fast pace and is expected to have a population of 16.2 million by 2011. Mira-Bhayander sub-region which has registered tremendous growth during 1981-91 (10.08%), is expected to reach to 6.2 million population by 2011. The special planning efforts in the Vasai-Virar Notified Area is expected to cause a phenomenal growth in the Nallasopara and Virar sub-region.

## Proposed Regions and Sub Regions in MMR



### LEGEND

- |  |  |
|--|--|
| 1 GREATER MUMBAI                       | 3.8 SOUTH KALYAN ULHAS SUB REGION            |
| 1.1 ISLAND CITY                        | 3.9 NORTH KALYAN ULHAS SUB REGION            |
| 1.2 WESTERN SUBURB                     | 4 NAVI MUMBAI                                |
| 1.3 EASTERN SUBURB                     | 4.1 NMMC ( EXCL. 15 VILLAGES )               |
| 2 WESTERN REGION                       | 4.2 NMMC ( 15 VILLAGES )                     |
| 2.1 MIRA-BHAYANDER SUB REGION          | 4.3 PANVEL SUB REGION                        |
| 2.2 VASAI-NAVGHAR SUB REGION           | 4.4 URAN SUB REGION                          |
| 2.3 NALLASOPARA SUB REGION             | 5 NERAL-KARJAT SUB REGION                    |
| 2.4 VIRAR SUB REGION                   | 5.1 KARJAT SUB REGION                        |
| 2.5 VVNA-COASTAL SUB REGION            | 5.2 KHALAPUR SUB REGION                      |
| 2.6 VVNA RURAL SUB REGION              | 6 PANVEL-URAN REGION ( OUT SIDE NEW BOMBAY ) |
| 2.7 REST VASAI TEHSIL SUB REGION       | 6.1 RASAYANI-PANVEL SUB REGION               |
| 3 NORTH-EAST REGION                    | 6.2 REST OF PANVEL SUB REGION                |
| 3.1 THANE SUB REGION                   | 6.3 KOPTA SUB REGION                         |
| 3.2 K.M.C. SUB REGION                  | 6.4 REST OF URAN SUB REGION                  |
| 3.3 ULHASNAGAR SUB REGION              | 6.5 KARNALA SUB REGION                       |
| 3.4 AMBERNATH SUB REGION               | 7 PEN REGION                                 |
| 3.5 BADLAPUR SUB REGION                | 8 ALIBAG REGION                              |
| 3.6 BHIWANDI SUB REGION                |  |
| 3.7 REST OF BHIWANDI TEHSIL SUB REGION |  |

Figure 3.5

- 3.6.5** Northeast sub-region is also expected to grow at a fairly rapid pace. KMC, which has already achieved million + status in 1991, is expected to reach a figure of 17.7 million by 2011. Similarly Bhiwandi sub-region is expected to cross 1 million figure by 2011. The rural population in this region is likely to decrease because of the pace of urbanisation experienced in this area.
- 3.6.6** Navi Mumbai Region is bound to grow at a faster rate because of the development of Mankhurd-Belapur Rail Line, Jawaharlal Nehru Port at Nhava-Sheva and the various housing projects being undertaken in Navi Mumbai. It is expected that Navi Mumbai region will have a population of 1.82 million by 2011.
- 3.6.7** Neral-Karjat Region, which is predominantly rural, is expected to stagnate because of its peculiar topography. The Panvel-Uran Region outside Navi Mumbai is, however, expected to grow steadily mainly on account of proposed new town development at Khopta and development of Rasayani.
- 3.6.8** Pen region is also expected to grow during 2001 to 2011 on account of the proposed development around Pen during that decade. The Alibag region during 2001 and 2011 is expected to grow at a faster rate mainly on account of the proposed 2nd international air-port at Mandwa which is likely to come up during that period.
- 3.6.9** Thus the overall population of MMR would be 18.5 million by 2001 and 22.4 million by 2011 on the basis of likely trends of urbanisation and developments as reflected in the individual sub-region projections. Sub-region wise population distribution in the past and future is shown in Figure-3.6 and 3.7.
- 3.6.10** The above population distribution is to be taken as most likely scenario. The population growth, particularly in the areas outside Greater Mumbai, would be influenced by the infrastructure development. It is likely that if the necessary developments in those areas do not take place then the growth of Greater Mumbai would be much above the projected rate. This population distribution should therefore be taken as the guiding factor for planning and infrastructure development. This projection does not exclude the possibility that some of the areas in MMR can attract more population because of the faster pace of development. The review of the population projection and distribution should, therefore, be taken by MMRDA in year 2001 when the next census data is available. The revised Regional Plan for the next 20 years is, therefore based on the above population projections keeping in view of these limitations.

Population Distribution in North-East Region									
Region/ Sub Region	Population					Compound Growth Rate (%)			
	1971	1981	1991	2001	2011	1971-1981	1981-1991	1991-2001	2001-2011
<b>Greater Mumbai</b>	5,970,575	8,243,405	9,925,891	11,430,000	12,931,000	3.28	1.87	1.42	1.24
Island City	3,070,378	3,285,040	3,174,889	3,000,000	2,825,000	0.68	-0.34	-0.57	-0.60
Western Suburb	1,705,494	2,858,152	3,947,979	4,930,000	5,910,000	5.30	3.28	2.25	1.83
Eastern Suburb	1,194,703	2,100,213	2,803,023	3,500,000	4,196,000	5.80	2.93	2.25	1.83
<b>Western Region</b>	232,659	332,421	595,868	1,063,092	1,619,031	3.63	6.01	5.96	4.30
Mira-Bhayander Sub-Region	31,860	67,195	175,605	375,000	617,000	7.75	10.08	7.88	5.11
Vasai-Navghar Sub-Region	67,500	80,750	127,975	162,069	207,867	1.81	4.71	2.39	2.52
Nallasopara Sub-Region	16,078	29,319	83,800	229,507	426,386	6.19	11.07	10.60	6.39
Virar Sub-Region	27,266	42,904	77,965	168,574	270,885	4.64	6.15	8.02	4.86
VVNA Coast Sub-Region	66,790	75,461	91,304	89,494	68,065	1.23	1.92	-0.20	-2.70
VVNA Rural Sub-Region	15,276	25,211	25,206	24,713	18,382	5.14	0.00	-0.20	-2.92
Remaining Areas of Vasai Tehsil	7,889	11,581	14,013	13,735	10,446	3.91	1.92	-0.20	-2.70
<b>North - East Region</b>	1,054,207	1,799,628	2,921,172	4,216,704	5,283,177	5.49	4.96	3.74	2.28
TMC Sub Region	254,045	474,438	803,389	1,121,000	1,435,000	6.45	5.41	3.39	2.50
KMC Sub Region	246,038	440,310	820,584	1,400,348	1,766,503	5.99	6.42	5.49	2.35
Ulhasnagar Sub Region	172,947	281,728	385,095	491,513	613,400	5.00	3.17	2.47	2.24
Ambarnath Sub Region	58,303	99,655	125,801	153,351	186,934	5.51	2.36	2.00	2.00
Badlapur Sub Region	19,201	32,801	52,154	70,091	85,440	5.50	4.75	3.00	2.00
Bhiwandi Sub Region	157,300	295,484	497,300	748,247	1,019,334	6.51	5.34	4.17	3.14
Bhiwandi Rural Sub Region	84,124	101,528	128,756	126,204	95,985	1.90	2.40	-0.20	-2.70
South Kalyan Ulhas Sub Region	33,705	39,251	65,402	64,106	48,756	1.53	5.24	-0.20	-2.70
North Kalyan Tehsil Sub Region	28,544	34,433	42,691	41,845	31,825	1.89	2.17	-0.20	-2.70
<b>North-East Region</b>	1,054,207	1,799,628	2,921,172	4,216,704	5,283,177	5.49	4.96	3.74	2.28
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Badlapur Sub-Region	19,201	32,801	52,154	70,091	85,440	5.50	4.75	3.00	2.00
Bhiwandi Sub-Region	157,300	295,484	497,300	748,247	1,019,334	6.51	5.34	4.17	3.14
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North Kalyan Tehsil Sub-Region	28,544	34,433	42,691	41,845	31,825	1.89	2.17	-0.20	-2.70
<b>Navi Mumbai Region</b>	160,669	257,913	548,476	1,166,558	1,816,376	4.85	7.84	7.84	4.53
NMMC (Excl. 15 villages)	40,063	89,606	307,724	905,000	1,533,000	8.38	13.13	11.39	5.41
NMMC (15 villages)	6,137	7,412	10,723	10,513	7,995	1.91	3.76	-0.20	-2.70
Panvel Sub-Region	69,112	101,623	158,362	172,349	199,625	3.93	4.54	0.85	1.48
Uran Sub-Region	45,357	59,272	71,667	78,696	75,756	2.71	1.92	0.94	-0.38
<b>Neral-Karjat Region</b>	112,516	132,385	166,021	180,471	177,308	1.64	2.29	0.84	-0.18
Karjat Sub-Region	75,939	84,786	93,629	95,709	84,141	1.11	1.00	0.22	-1.28
Khalapur Sub-Region	36,577	47,599	72,392	84,762	93,167	2.67	4.28	1.59	0.95
<b>Panvel-Uran Region (Outside Navi Mumbai)</b>	108,679	139,333	180,828	227,193	287,327	2.52	2.64	2.31	2.38
Rasayani-Panvel Sub-Region	41,031	55,918	77,602	106,230	135,454	3.14	3.33	3.19	2.46
Rest Panvel Sub-Region	32,263	39,378	52,064	51,032	38,812	2.01	2.83	-0.20	-2.70
Khopta Sub-Region	24,119	30,217	34,530	53,624	100,660	2.28	1.34	4.50	6.50
Rest Uran Sub-Region	4,247	4,855	5,586	5,477	4,165	1.35	1.41	-0.20	-2.70
Karnala Sub-Region	7,019	8,965	11,046	10,830	8,236	2.48	2.11	-0.20	-2.70
<b>Pen Region</b>	56,624	73,835	88,297	92,444	138,693	2.69	1.80	0.46	4.14
<b>Alibag Region</b>	81,602	99,109	107,811	110,097	188,061	1.96	0.85	0.24	5.50
<b>Mumbai Metropolitan Region</b>	<b>7,777,531</b>	<b>11,078,029</b>	<b>14,534,364</b>	<b>18,486,559</b>	<b>22,440,973</b>	<b>3.60</b>	<b>2.75</b>	<b>2.43</b>	<b>1.96</b>



# MMR Project Population (2001-2011)

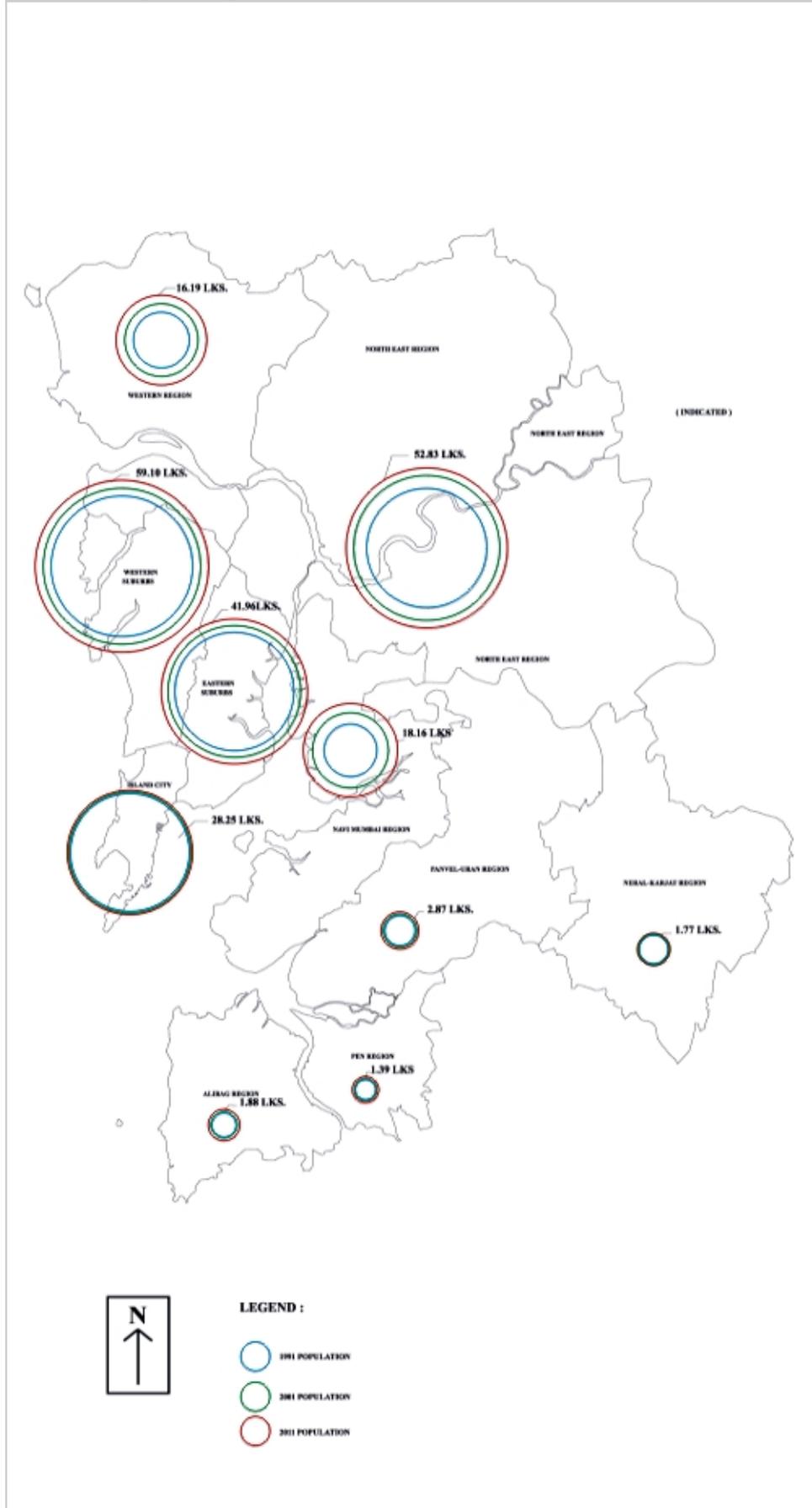


Figure-3.7