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Demographic Dynamics of Mega-Urban Regions: The Case of Mumbai

Introduction

MEGA-URBAN REGIONS—marked by the spreading of urban agglomerations outside official metropolitan boundaries of major cities, zones of intense interaction between what are usually considered urban and rural forms of settlement and of economic and social activities, and often by a polynucleated urban form, are recognised in several studies (Ginsburg, Koppel and McGee, 1991; Jones and Douglass, 2008) as a key emerging form of urbanization. There have been various approaches to studying mega-urban regions and the dynamics of population change. One promising approach is to utilize satellite mapping, based on analysis of night lights viewed from space (Amaral *et al.*, 2006). While this approach can help to track the geographic dimensions of urban agglomerations, the geographic units so defined need to be linked with demographic data for those same units if the dynamics of change are to be better understood. An alternative approach, utilizing population census data, defining the extent of mega-urban regions (MURs) according to certain criteria, and breaking these mega-urban regions into three zones (core, inner and outer), was adopted by Jones and Douglass (2008) in a systematic study of the dynamics of change in the mega-urban regions of Jakarta, Bangkok, Manila, Ho Chi Minh City, Taipei and Shanghai over the 1990 to 2000 period. This approach is equally applicable to mega-urban regions in other parts of the world, but this has not yet been done. Jones and Douglass lamented that their study was unlikely to be replicated using the 2010 round of censuses, because of the difficulty of gaining access to the necessary census data for the zones they identified in the various cities.

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Fortunately, however, it is possible to study dynamics of change in Mumbai using a similar perspective, because the administrative divisions used for official planning of Mumbai represent quite effectively the three zones required for the analysis. This paper will do this, utilizing data from the recent 2011 Population Census. In future, it is planned to widen the analysis to cover some other major Indian cities.

The mega-urban regions of Asia face daunting issues of regional planning and governance. Their planning issues take on national-level dimensions; after all, Mumbai contributes 40 per cent of the GDP of the state of Maharashtra—the second most populous state in India with 112 million population in 2011—and 5 per cent of the national GDP. The contribution of Bangkok and Jakarta to their national GDP is even more striking: 44 per cent and 26 per cent respectively¹. Unfortunately, the structure of the governance of mega-urban regions does not reflect their key role in the national economy. In all the MURs, the proportion of the population living outside the core is increasing, but there is typically no over-arching planning mechanism in place for the MUR as a whole; rather, the planning structure is very complex and multi-layered, with different jurisdictions having responsibility for different aspects of administration and development planning (see Firman, 2014, on Jakarta). Mumbai faces all these problems in full measure, and to understand its problems of administration and governance requires an understanding of the demographic dynamics of the mega-urban region as a whole.

Mumbai: City and Region

Mumbai, earlier known as Bombay, is a city of many contrasts. Adorned with names such as the *Urbs Prima in Indis*¹ and *Maximum City*², it is India's largest city, generating 33 per cent of the country's income tax, 60 per cent of customs duty, 20 per cent of central excise duty and 40 per cent of foreign trade (Municipal Corporation of Greater Mumbai, 2009). It is also a city of dreams for many Indians with strong Bollywood fascinations. The name change to Mumbai in 1995 reflects the changing ideology and structure of politics in Mumbai.

Mumbai is neither an ancient nor a medieval city, but was created during British rule of India. The city began its existence in 1661 when the British East India Company occupied a cluster of seven islands inhabited by a fishing community locally known as *Kolis*. The cluster of islands were wedged together measuring an area of 68.7 sq km—known as island city. The island city was later connected to Salsette Island, situated to its north, through reclamation.

¹In the case of Mumbai, the contribution of Mumbai Metropolitan Region to Maharashtra's GDP pertains to the year 2003-04 (The Urban Institute 2006: 14). The figure for the share in India's GDP is estimated for the year 2003-04 based on available information (see figures on GDP for Mumbai Metropolitan Region, *The Urban Institute* 2006, p. 61 and for India's GDP, *Economic Survey* 2004-05, <http://indiabudget.nic.in>, p. S-1). The Bangkok figure is for the Bangkok Metropolitan Region in 2010 (*NESDB*, 2012). The Jakarta figure is for Jabodetabek in 2006 (World Bank Jakarta Office, 2010).

²*Urbs Prima in Indis*, reads the plaque outside the Gateway of India. The Gateway of India, a domed arch of yellow basalt surrounded by four turrets, was built in Bombay to commemorate the arrival of the British King George V in 1911.

³See Mehta, Suketu (2004).

The Island city together with Salsette Island forms the present day boundary of the Municipal Corporation of Greater Mumbai (MCGM). Mumbai has unique geographical features consisting of lowlands and highlands with long coastlines, beaches, creeks and several rivers. Most of the rivers have turned into sewers and people hardly knew them as rivers until the Mumbai flood occurred on 26th July 2006 (Bhagat *et al.*, 2006). Mumbai also has a large national park known as *Sanjay Gandhi National Park*, covering an area of about 100 sq km located in the northern part of the city within the municipal boundaries. This is perhaps the largest national park located in the heart of any city in the world (<http://www.sanjaygandhinationalpark.net>).

Mumbai initially began as a port centre and the cotton textile industries provided the economic base of the city. The first cotton mill was established in 1854. Being a colonial port city, the spatial layout of Mumbai was organized around the port and it functioned as a gateway between its hinterland and England. The Municipal Corporation of Bombay was established in 1872. The influence of Mumbai, along with other colonial port cities like Kolkata (Calcutta) and Chennai (Madras), has been so powerful that they have reshaped the spatial pattern of urbanization in India in complete contrast to the pattern observed during medieval and ancient times (Ramachandran, 1995).

The city of Mumbai has experienced unbridled economic and demographic growth over time. As the city has evolved, population growth and migration have continued to be core issues from the point of view of planning and governance. The issue of migration into Mumbai assumes enormous significance through its deep impact on city and state politics.

This paper studies the spatial dynamics of population change and migration pattern in Mumbai and its adjoining areas and reflects upon planning and governance in the city. It follows the approach developed by Jones and Douglass (2008), who stressed that the city cannot be understood simply by what is happening within the administrative city area or in the urban agglomeration, but the spatial dynamics unfolding in the entire mega-urban region must be taken into account.

Geographically, the Mumbai mega-urban region has three distinct entities which are as follows:

1. Mumbai city (MCGM)
2. Mumbai UA⁴ (Urban Agglomeration)
3. Mumbai Metropolitan Region (MMR)

For our study, the core area is defined as Mumbai City (MCGM); this core is again divided into island city and suburbs. The inner zone comprises Mumbai UA minus MCGM, and the outer zone consists of towns and rural areas outside Mumbai UA but within MMR

⁴Urban Agglomeration (UA) is a continuous urban spread constituting a town and its adjoining outgrowths (OGs), or two or more physically contiguous towns together with or without outgrowths of such towns. An Urban Agglomeration must consist of at least a statutory town and its total population (i.e. all the constituents put together) should not be less than 20,000 as per the 2001 Census. In varying local conditions, there were similar other combinations which have been treated as urban agglomerations satisfying the basic condition of contiguity. Examples are Greater Mumbai UA, Delhi UA, etc.

(Fig. 1). The MMR is therefore equivalent to Jones and Douglass' 'mega-urban region'. The core, inner and outer zones of the mega-urban region have been distinctively established through historical and planning processes. The three zones in the MMR have very intense inter-relationships, but in terms of administration and planning these relationships are complex. Within the different zones of MMR there are a number of governing and planning bodies, which are depicted in Fig. 2. The national government and the Maharashtra state government,



Fig. 1. Mumbai Metropolitan Region—Core, Inner and Outer Zone

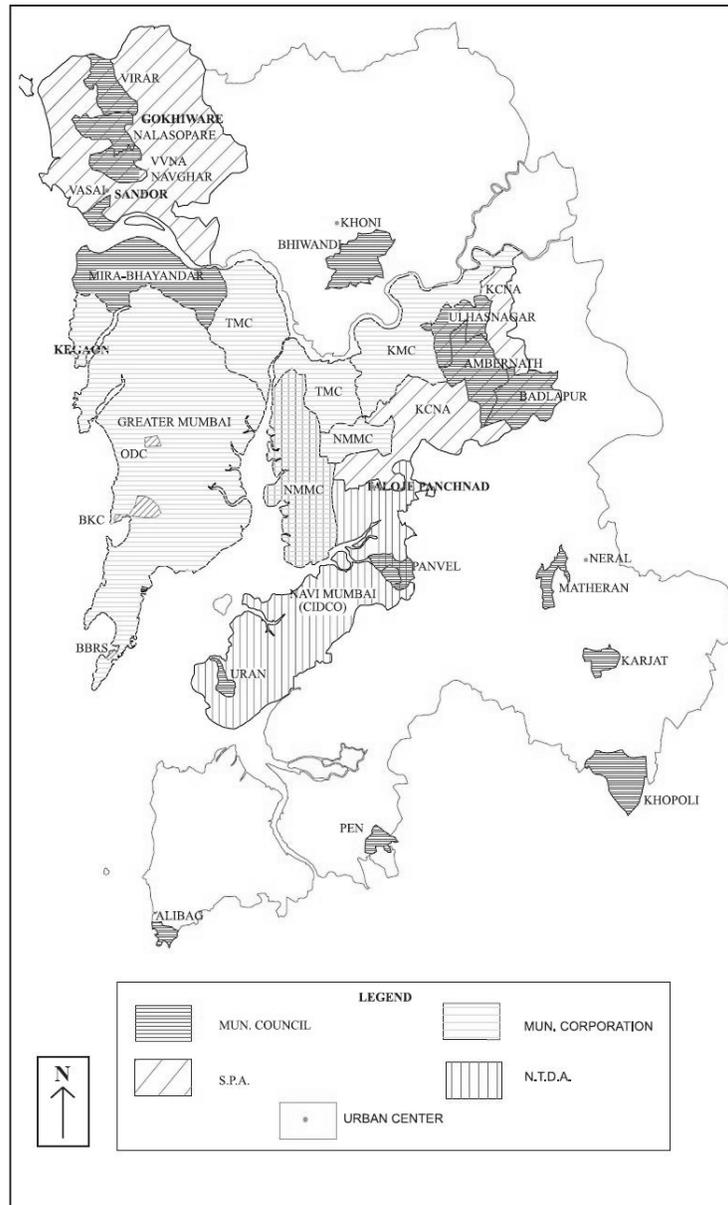


Fig. 2. Local Governance Structure and Planning Authorities in MMR

N.T.D.A—New Town Development Authority; S.P.A.—Special Planning Authority; KCNA—Kalyan Complex Notified Area; BKC—Bandra Kurla Complex; ODC—Oshiwara District Centre; TMC—Thane Municipal Corporation; KMC—Kalyan Municipal Corporation; NMMC—Navi Mumbai Municipal Corporation; BBRIS—Backbay Reclamation Scheme; CIDCO—City and Industrial Corporation.

Source: Bombay Metropolitan Region Development Authority (1995), p. 8.

as well as autonomous public sector corporations set up by the state government, also play key roles in matters affecting the development of Mumbai. There is a lack of effective coordination between these bodies in the overall planning and administration of the Mumbai region (Patel, 2007).

Mumbai in a Broader Asian Context

Asian megacities are generally considered to be the most densely settled on earth. According to one study (Demographia, 2015), Dhaka and Mumbai are the world's two most densely settled mega-cities, and the six most densely settled mega-cities are all in Asia. The Demographia study used much wider boundaries for many of its megacities than did the United Nations Population Division in its "urban agglomeration" figures. Thus according to Demographia, Jakarta was the second largest urban area in the world in 2015, with a population of 30.9 million, and Manila was the fourth largest, with 24.1 million. By contrast, according to the UN, in 2014 Jakarta was the 28th largest urban agglomeration, with 10.2 million, and Manila was the 18th largest, with 12.8 million. These wide differences result partly from a difference in approach. Basically, the Demographia approach is to include the whole mega-urban region in the "urban area" population, whereas the UN approach is to limit the population to the urban agglomeration (i.e. the built-up area, often extending well beyond official metropolitan boundaries).⁵ In terms of the Jones and Douglass (2008) procedure in measuring mega-urban regions, the UN approach includes the core and the inner zone, whereas the Demographia approach includes the outer zone as well a zone which still includes substantial rural areas.

However, for Jakarta, the heavy underestimation of its urban agglomeration population by the UN results from their failure to include large areas of the urban agglomeration in its population estimate. The Demographia figure is much closer to the reality, and there is no doubt that Jakarta should be ranked in the top 10 of the world's urban agglomerations.

How does Mumbai compare with other Asian megacities in terms of population density in the areas that can be considered to make up the urban agglomeration – i.e. the core and the inner zone? This is examined in Table 1. Six of the seven Asian cities included in this table all rank in the top 20 largest urban agglomerations in the world (UN Population Division, 2014), so the table is dealing with almost one third of the world's 20 largest cities. The comparison is for the year 2000, because although data are available for the core and inner zones of some of these cities for 2010, the year 2000 is the most recent year for which data were available to the authors for all of them. Populations and population densities, particularly in the inner zones of these urban agglomerations, had of course risen considerably by 2010.

Importantly for the present study, the land area of the core in Mumbai (603 sq. km.) is almost identical with that in Jakarta (662 sq. km.), Manila (633 sq. km.) and Shanghai (605 sq. km.). In all cases, the core approximates the official administrative area of the metropolitan

⁵In reality, though, the UN estimates of the populations of urban agglomerations are sometimes unrealistically low, because they are forced to rely on the urban agglomeration figures supplied by member states, which adopt widely different procedures for estimating these populations.

TABLE 1: AREA, POPULATION AND POPULATION DENSITY, CORE AND INNER ZONES, IN DHAKA AND SOME OTHER ASIAN MEGA-URBAN REGIONS, 2000

	<i>Area (sq. km.)</i>	<i>Population ('000)</i>	<i>Density (per sq.km)</i>
KOLKATA			
Core	237	5,580	23,572
Inner zone	797	7,625	9,564
Total*	1,034	13,205	12,770
MUMBAI			
Core	603	11,970	19,758
Inner zone	532	4,390	8,250
Total*	1,135	16,360	14,421
DHAKA			
Core	316	5,327	16,858
Inner zone	1,055	4,346	4,119
Total*	1,371	9,673	7,055
JAKARTA			
Core	662	8,347	12,610
Inner zone	2,374	9,435	3,975
Total*	3,036	17,782	5,857
BANGKOK			
Core	876	5,876	6,709
Inner zone	1,907	2,380	1,248
Total*	2,783	8,256	2,967
MANILA			
Core	633	9,880	15,642
Inner zone	3,105	6,365	2,047
Total*	3,783	16,245	4,294
SHANGHAI			
Core	605	9,934	16,415
Inner zone	1,753	3,292	1,871
Total*	2,358	13,226	5,609

Source: for Jakarta, Bangkok, Manila, Shanghai: Jones and Douglass, 2008, Table 3.1; for Mumbai, Bhagat and Jones, 2013 (Core = MCGM, core + inner zone = Mumbai UA); for Dhaka, Core is Dhaka City Corporation, inner zone comprises five Paurashavas (municipalities) plus a number of other urban areas making up the officially defined Dhaka Megacity. For Kolkata, Core is Kolkata and Howrah Municipal Corporations; Inner Zone = Kolkata UA minus Core.

*Total = Core plus Inner Zone.

city, while the inner zone consists of the built-up areas lying outside the official metropolitan boundary. Clearly, Kolkata's and Dhaka's cores are only about half the area of the cores of most of the other cities. The population density in the cores of all these metropolitan areas except Bangkok is very high—ranging from 23,572 per sq. km. in Kolkata to 12,610 per sq. km. in Jakarta. It is highest of all in the three South Asian cities, though Shanghai is only marginally below Dhaka.

The inner zones of the South Asian megacities—Kolkata, Mumbai and Dhaka—are all smaller in area than those of the Southeast and East Asian cities included in the table. This no doubt exaggerates the differences in density in the inner zones, but there is no doubt that,

even if the inner zones of the other cities were cut back in area, sharp differences in density would still be evident compared with the South Asian megacities. However, it is quite likely that Jakarta's inner zone density would exceed that of Dhaka if its inner zone were constricted to a smaller, more densely populated area as in the case of the South Asian megacities. Contrary to the findings of the Demographia study cited earlier, Mumbai is the most densely settled urban agglomeration in the world; its core and inner zone are both more densely settled than those of Dhaka, and its total urban agglomeration is twice as densely populated as that of Dhaka. Its inner zone, though, is slightly less densely populated than that of Kolkata.

Dhaka's core has roughly the same population density as Manila and Shanghai, a little higher than Jakarta and well above Bangkok. Its inner zone is slightly more densely settled than that of Jakarta, and well ahead of the other cities except Mumbai. In some ways the comparison between Mumbai, Dhaka and the other cities is misleading, because the population density in both Mumbai and Dhaka is probably underestimated in comparison with the other cities. In the case of Mumbai, the reason is that there are large areas lying within the MCGM which lie under the control of different authorities and for various reasons (one of the areas is a national park!) have only a small population.⁶ Likewise, Dhaka has large areas within the core and the inner zone where water bodies or low lying land subject to flooding prevents construction of housing or commercial buildings unless major land filling operations are conducted. It appears to have much larger areas of such land than the other cities. If the "land area" used in calculating population densities were to exclude such areas, the densities calculated for both Mumbai and Dhaka would rise considerably. However, without further detailed study, the extent to which this would raise their calculated densities relative to the other cities is not certain; the other cities also have areas within their urban agglomerations which for various reasons are not densely populated.

While Mumbai's population density in the core is higher than that in any of the other megacities except Kolkata, the key contrast between Mumbai and the other urban agglomerations is in the inner zone, where population density in Kolkata and Mumbai is far higher than for the other megacities. Bearing in mind that the area of Kolkata's core is not much more than one third as large as that of Mumbai, and that this artificially inflates the density of its inner zone compared with that of Mumbai, we can draw the conclusion that the densely populated area in Mumbai spreads much further from the city centre than is the case for any of the other cities.

Data Issues—Census Population

The following detailed analysis of demographic change in Mumbai is based on census data. It is therefore important to know how far the population is correctly enumerated. India has a long history of conducting population censuses since the late 19th century, and the 2011

⁶The Municipal Corporation of Greater Mumbai uses an area figure of 437.71 sq km, which differs considerably from the figure of 603 sq km provided by Surveyor General of India and also used by the Census. This is largely due to the exclusion from the figure of the areas controlled by different authorities such as the Port Trust, Ministry of Defense, Atomic Energy Commission and Sanjay Gandhi National Park, which lie within the precinct of MCGM but have only a small population.

Census was the fifteenth census conducted since then. Although the quality of data on population size was affected by socio-political conditions during British rule such as the civil disobedience movement (Hutton, 1986), there was no precise evaluation of the quality of data by the British Indian censuses. However, in the censuses conducted in independent India since 1951, post enumeration checks were carried out to assess the quality of the census data. The net omission rate was 2.7 per cent in urban areas as a whole in the 1981 Census compared to 3.9 per cent in the 2001 Census, and declined to 2.9 per cent in 2011 (<http://www.censusindia.gov.in/2011Census/pes/Pesreport.pdf>). This indicates some decrease in the net omissions of population in urban areas in the last decade. However, the census does not make any adjustment for the net omission rates in its final population.

India's census is an extended de facto count conducted by door to door visits by enumerators during 8th to 28th February in the census year. Houseless population found sleeping on pavements, parks, flyovers and open places etc. is also enumerated on the night of 28th February. The latest data on houseless population was 57,416 in Mumbai (MCGM) recorded by the 2011 Census (http://www.censusindia.gov.in/2011census/population_enumeration.html). It is likely that the houseless population is under-enumerated, and the same may also be true for some short duration temporary migrants as well. These two groups might have contributed to some increase in the omission of population in the recent censuses. Nevertheless, the magnitude of such omissions does not seem to be large enough to invalidate the use of census data to study broad trends in Mumbai's population size and composition.

Population Changes

The Core: Mumbai City (MCGM)

Mumbai city (MCGM) is spread over a geographical area of 603 sq km harbouring a population of 12.47 million as per the 2011 Census. The density of population is very high i.e. 20,692 persons per sq km for the city as whole. Table 2 shows that the population (and of course the density of population) in Island city has changed little over the last several decades, with density remaining more or less around 20,000 to 21,000 persons per sq km, whereas the density in the suburbs has risen from 11,119 persons per sq km in 1981 to 20,924 persons in 2011. The suburbs of Mumbai MCGM are not suburbs in the classical sense, but administratively designated as suburban districts though they are very much part of the city. Mumbai is divided into 24 wards, and several wards are as big as a million city.

The history of population growth shows that Mumbai (MCGM) became a city of a million people in 1911 (Fig. 3). The population declined significantly during 1921-31, a decline attributed by the Census Commissioner to the effect of the economic depression in driving the migrants back to their homes (Hutton 1986:16). On the other hand, Mumbai grew very rapidly - over five per cent per annum - during the decade of independence (1941-51) and thereafter it grew at a rate of over three per cent per annum until 1981. After that, the growth rate decelerated to below 2 percent during 1981-91 and 1991-2001 before plummeting to less than 0.5 per cent in 2001-2011 (Fig. 4).

TABLE 2: SIZE, DENSITY, SHARE AND GROWTH OF POPULATION IN MUMBAI METROPOLITAN REGION (MMR) 1981-2011

Segment/year	Population in Million						Density Per Sq km						Share of Population in MMR (%)						Average Annual Exponential Growth Rate (%)			
	1981		1991		2001		1981		1991		2001		1981		1991		2001		1981-1991- 2001-1991		2001 2011	
	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981-1991- 2001-1991	2001 2011		
Island City	3.28	3.17	3.32	3.14	20,924	20,223	21,185	20,032	29.6	21.4	16.8	13.7	-0.34	0.46	-0.55							
Suburbs	4.96	6.75	8.65	9.33	11,119	15,137	19,188	20,924	44.7	45.6	43.7	40.9	3.08	2.37	0.86							
Mumbai (MCGM)	8.24	9.92	11.97	12.47	13,670	16,461	19,758	20,692	74.3	67.1	60.4	54.6	1.85	1.82	0.46							
Thane (M.Corp)	0.30	0.80	1.26	1.81	2,421	6,276	9,859	14,177	2.7	5.4	6.4	7.9	9.52	4.52	3.7							
Kalyan-Dombivili(M. Corp)	0.13	1.00	1.49	1.67	1,301	9,708	14,306	16,028	1.1	6.7	7.5	7.3	20.09	3.88	1.1							
Ulhasnagar (M.Corp)	0.27	0.36	0.47	0.50	21,051	28,390	36,384	38,923	2.4	2.4	2.4	2.1	2.99	2.48	0.7							
Mira-Bhayander (M. Corp)	0.02	0.17	0.52	0.81	324	2,222	6,580	10,251	0.2	1.1	2.6	3.5	19.23	10.89	4.5							
Navi-Mumbai (M.Corp)	NA	0.30	0.70	1.11	NA	2,317	5,300	8,423	NA	2.0	3.5	4.8	NA	8.29	4.6							
Mumbai UA[®]	9.42	12.59	16.36	18.41	8,299	11,092	14,421	16,219	84.9	85.1	82.5	80.2	2.90	2.61	1.2							
MMR^{®®}	11.09	14.78	19.81	22.80	2,546	3,393	4,549	5238	100	100	100	100	2.87	2.92	1.40							

Source: Census of India 2001, Series I, India, *Town Directory* (Compact Diskette), Registrar General and Census Commissioner, India, New Delhi; *Census of India 2001*, Series 28, Maharashtra, Paper 2 of 2001, "Rural-Urban Distribution of Population", Director of Census Operations, Mumbai; For 2011 Census, see website www.censusindia.gov.in; Bombay Metropolitan Region Development Authority (1995). For Jakarta, Manila, Bangkok and Shanghai, Jones, 2008, Table 3.1. [®]Small towns are not shown as separate entity, but included in UA; ^{®®}—includes both rural and urban components.

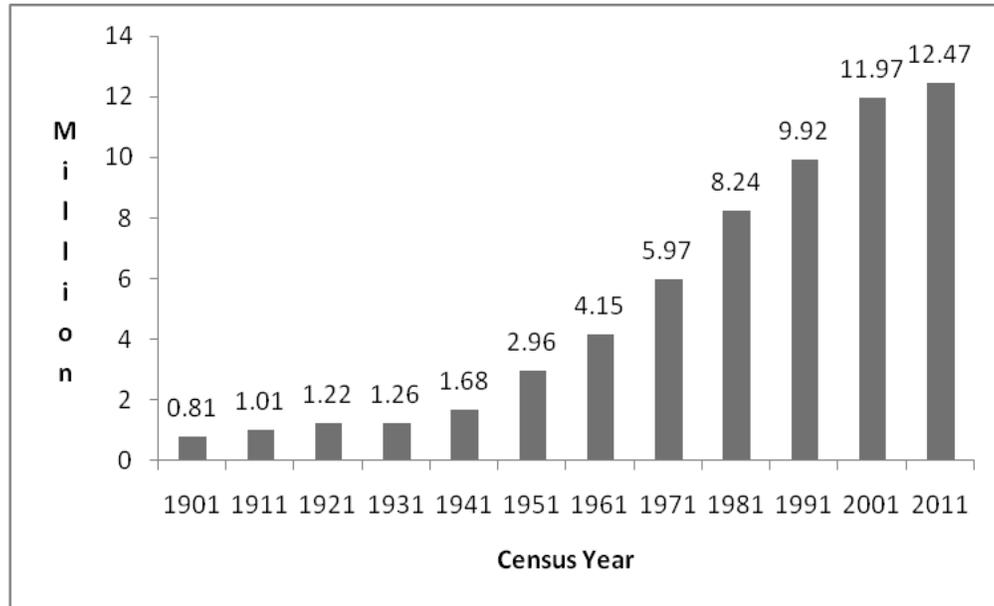


Fig. 3. Population of Greater Mumbai Municipal Corporation (MCGM), 1901-2011

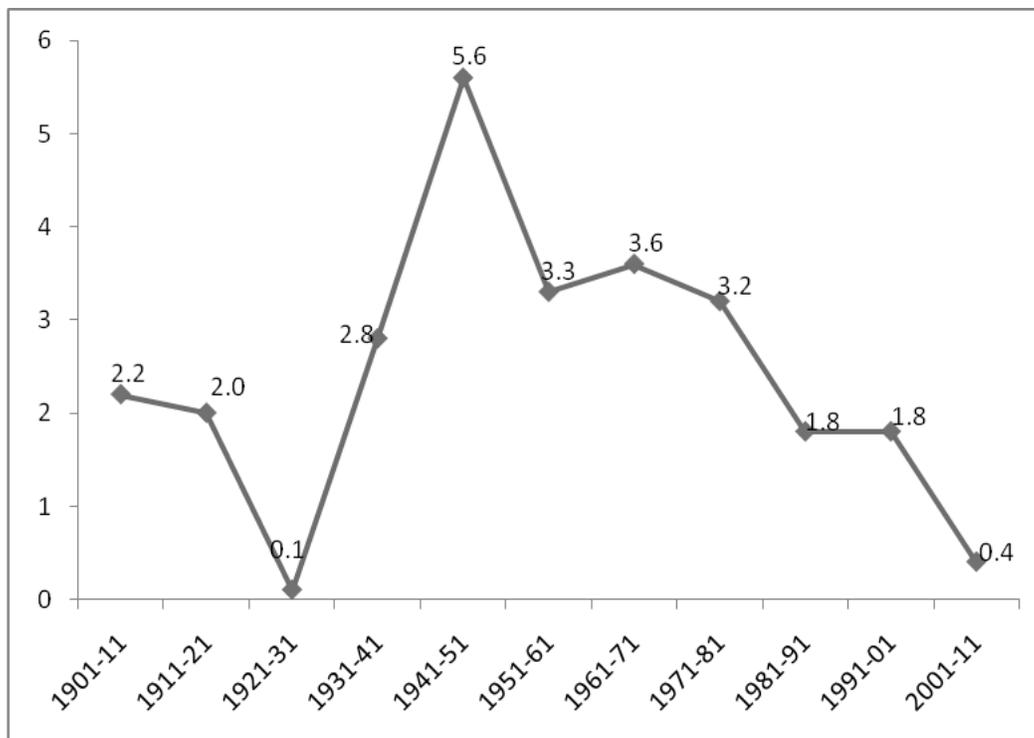


Fig. 4. Average Annual Exponential Growth Rate (%) Mumbai City (MCGM)

Mumbai experienced a significant economic transition during the 1980s and 1990s. This transition has much to do with the closure of the textile mills, followed by the prolonged strikes by textile workers. Subsequently, there was also a large-scale relocation of engineering, chemical and pharmaceutical industries to areas adjacent to MCGM in the MMR. The de-industrialization of Mumbai in the 1980s and 1990s was so prominent that it turned into a service city (Bombay Metropolitan Region Development Authority 1995; MCGM 2009; 51). The greater part of the service economy falls under informal activities, where the average income of a worker is hardly Rs 6,000 per month (about 120 US \$) (MCGM, 2009). This was apparently reflected in the declining population growth of the city to well below two per cent per annum during the 1980s and 1990s.

Intra-urban population distribution is shown in Table 2. A number of studies (Sita and Phadke, 1984; Gupta and Prasad, 1996) showed that the spatial distribution of population in Mumbai had undergone significant changes, particularly since 1961. The decrease in the relative share of population in the Island city continued. The trend towards suburbanization was very apparent, with the share of the suburbs increasing from 60% in 1981 to 75% in 2011 in Mumbai (MCGM).

The dramatic decline in the rate of population growth in the core during the past decade appears to signal a new era in the history of the Mumbai mega-urban region, though to some extent there was continuity with already observable trends—a roughly unchanging population size in the island city, (a stagnation now dating back for four decades), and continuing growth in the suburban areas to the north. The significant development in the 2001-2011 period, however, was the spectacular decline in population growth in the suburbs of the core region from about 2.3 percent per annum in the decade 1991-2001 to 0.8 percent per annum during the decade 2001-2011. The locus of rapid growth of population has shifted outside the core region altogether.

The dynamics of population change in the island city deserves more detailed attention. The island city consists of 9 wards out of 24 wards of Mumbai city (MCGM). Most of the wards of Island city showed decline in population between 2001 and 2011. However, the most spectacular decline is observed in wards A, B, and C. Ward A consists of areas like Fort, Esplanade and Colaba which were initially the British and European settlements, and at present the commercial heart of the city. The population of ward A declined sharply from 210 thousand in 2001 to 148 thousand in 2011. Wards B and C where the native population settled first during British time, and the most congested part of the Island city at the moment, have also seen a decline, from 140,000 to 127,000 in Ward B and from 202,000 to 165,000 in Ward C between 2001 and 2011. Ward C is the most densely populated ward of Mumbai city with a population density of about 100,000 persons per sq km (MCGM 2009: 32). Other wards, namely D, E, F/S, G/S, where most of the cotton textile mills were located, have also recorded a decline in population during 2001-2011. Some wards like C, D and E have shown continued decline in population since 1981 or even before. In the last two decades, most parts of island city have been experiencing significant changes leading to the establishment of malls, shopping arcades and residential towers in place of mills (Shaban 2010: 50).

Mumbai UA (Core plus Inner Zone)

The Mumbai UA consists of Mumbai City (MCGM) and other adjoining cities and towns namely Navi Mumbai, Thane, Kalyan, Balclapur, Ambernath, Ulhasnagar and Mira-Bhayander. The area of Mumbai UA covers 1,135 sq. km., at a density of about 16,000 persons per sq km. Among the adjoining cities, density varied from about 8000 persons per sq. km. in Navi-Mumbai (M.Corp) to about 38,000 in Ulhasnagar (M.Corp) (see Table 2).

The Mumbai UA is the largest in India in terms of population. In 2011, the population exceeded 18 million, having doubled since 1981 (Fig. 5).⁷ Of Mumbai UA's total population, MCGM contributed a little more than 12 million (Table 2), and the main satellite towns, Kalyan-Dombivli, Thane and Navi Mumbai, each has a population exceeding one million. Navi Mumbai is a planned city established three decades ago. Cities like Vasai Virar (M Corp) with a population 1.2 million, and Navi Mumbai Panvel Raigad—a non-municipal town with a population of 194,000 and Panvel Municipal Council with a population of 180,000 in 2011, are situated very close to Mumbai UA and also functionally linked with suburban train and bus services, but are not part of the Mumbai UA. If these three cities were added in, the population of Mumbai UA would be about 20 million on 1st March 2011—exactly the projected population figure by the UN for the year 2010.

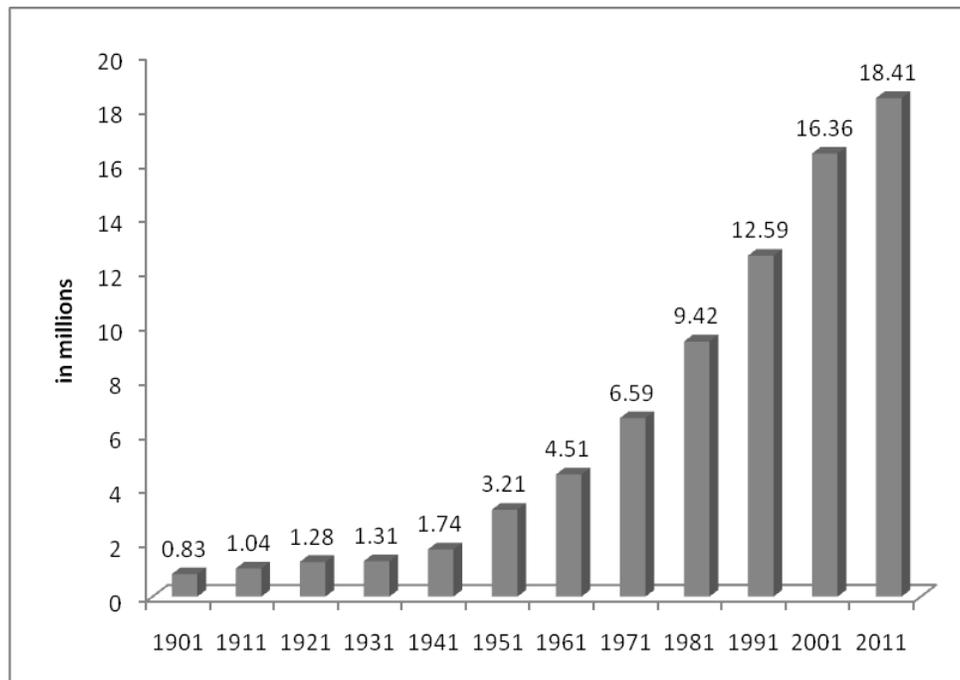


Fig. 5. Population of Mumbai UA 1901 to 2011 (in Millions)

⁷According to the UN projection Mumbai is the sixth largest UA in the world with an estimated population of 19.4 million in 2010 (UN 2014).

The growth rate of Mumbai UA is significantly higher than that of the Mumbai city (MCGM), reflecting the faster growth of satellite towns. The growth-rate of Mumbai UA has however decreased from 2.9 per cent per annum in 1981-1991 to about 2.6 per cent per annum during 1991-2001, and further declined hugely to 1.2 percent per annum during 2001-2011 (Fig. 6). As noted earlier, the decline was very significant in the core areas of Mumbai – i.e. MCGM, where the Island City actually experienced negative growth.

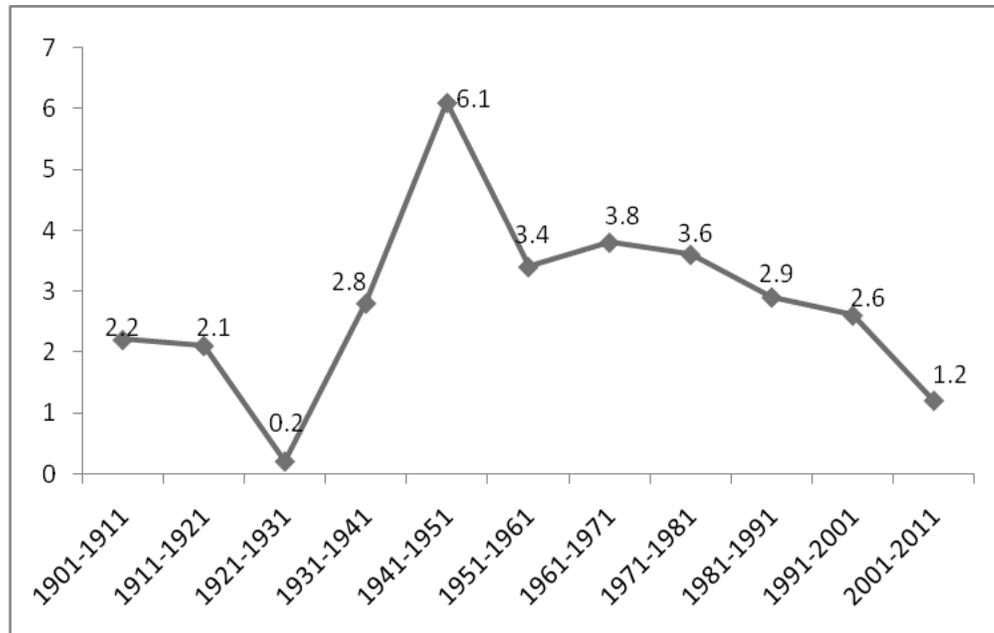


Fig. 6. Average Annual Exponential Growth Rate (%) Mumbai UA 1901 to 2011

The growth rates of two major satellite towns i.e. Kalyan-Dombivli and Thane have shown a marked decrease during 1991-2001 compared to 1981-91. This is partly due to administrative reorganization. The fastest growing satellite towns in 1991-2001 were Mira-Bhayander and Navi Mumbai, and this continued in 2001-2011 (see Table 2). The former reflects the outward movement of population along the western railway corridor, with relatively cheaper real estate acting as a pull factor. Navi Mumbai, after a sluggish start in the 1970s, took off during the 1991-2001 period and maintained its accelerated growth during 2001-2011 due to real estate development, growing employment opportunities in wholesale and retail business, agricultural marketing, IT industries and call centres and rapid improvement in mass transport links with the main city.

The Entire MUR—Mumbai Metropolitan Region (MMR)

Mumbai Metropolitan Region consists of MCGM and six other rapidly growing municipal corporations, 13 small towns with municipal councils and 995 villages spread over an area of 4,355 sq km. The boundary of MMR was first demarcated by the state government in 1967

and Mumbai Metropolitan Development Authority (MMRDA) was established in 1974. The population of MMR was about 20 million in the 2001 Census with a population density of over 4000 persons per sq km., and its projected population was 23.5 million in 2011 (Bombay Metropolitan Region Development Authority 1995). However, the actual population available from 2011 Census is 22.8 million- slightly lower than the projected population.

The core of the Mumbai Mega-Urban Region - MCGM – alone accounts for half of the population of the mega-urban region (MMR) although it comprises only 10% of the total geographic area. However, the core's share of the entire MMR population has decreased from 67 per cent in 1991 to 54 per cent in 2011, while the share of the Inner Zone has been increasing (see Table 5). There is a gradual increase in growth rates as we move outward from the Core to the Inner Zone. The Outer Zone has grown at the rate of 2.40 per cent per annum (and its urban areas by 2.87 per cent per annum) during 2001-2011 compared to the growth rate of 3 per cent per annum in the Inner Zone and just 0.4 per cent in the Core. Population in the MMR as a whole grew at the rate of 1.40 per cent per annum during 2001-2011- importantly, a lower growth rate than India's (1.64 per cent per annum during 2001-2011) but considerably lower than India's overall urban growth rate of 2.76 per cent per annum during the same period (Table 3).

In all but the outer zone (rural), there has been a decline in population growth rate during 2001-2011 compared to 1991-2001, and the decline was very sharp in the Core. The industrial structure of the Core has gone through significant changes in the recent past and it seems to have affected population growth and the migration pattern in the entire MMR region as well.

Industrial Restructuring, Changing Employment and Population Shift

Mumbai emerged as the largest commercial and industrial centre of India on the basis of port facilities and also due to its large-scale industry such as cotton textile mills, which

TABLE 3: SIZE, SHARE AND GROWTH OF POPULATION IN DIFFERENT ZONES IN THE MUMBAI METROPOLITAN REGION, 1991 TO 2011

<i>Population (in million)</i>	<i>Core</i>	<i>Inner Zone</i>	<i>Outer Zone (Urban)</i>	<i>Outer Zone (Rural)</i>	<i>Total MMR</i>
1991	9.92	2.67	0.86	1.33	14.78
2001	11.97	4.39	2.19	1.26	19.81
2011	12.47	5.94	2.92	1.47	22.8
<i>Share (in %)</i>					
1991	67.1	18.1	5.8	9.0	100.0
2001	60.4	22.2	11.2	6.3	100.0
2011	54.6	26.0	12.8	6.4	100.0
<i>Annual Exponential Growth Rate (in %)</i>					
1991-2001	1.82	4.96	9.38	-0.75	2.92
2001-2011	0.46	3.00	2.87	1.53	1.40

Source: Same as in Table 1.

TABLE 4: CONTRIBUTION OF MIGRATION AND NATURAL INCREASE TO POPULATION GROWTH IN MUMBAI METROPOLITAN REGION, 1991 TO 2011

<i>MMR/components</i>	<i>Core</i>		<i>Inner Zone</i>		<i>Outer Zone Urban</i>		<i>MMR (Urban)</i>	
	<i>1991-2001</i>	<i>2001-2011</i>	<i>1991-2001</i>	<i>2001-2011</i>	<i>1991-2001</i>	<i>2001-2011</i>	<i>1991-2001</i>	<i>2001-2011</i>
Population increase (in millions)	2.05	0.50	1.72	1.55	1.17	0.73	4.94	2.78
Natural increase (in millions)	1.24	0.85	0.45	0.44	0.17	0.16	1.86	1.45
Net migration (in millions)	0.81	-0.35	1.27	1.11	1.00	.57	3.08	1.33
% contribution of migration	39.5	-70.0	73.8	71.6	85.4	78.6	62.3	47.8

Source: Estimated by Authors.

started operation around 1850. At the beginning of the 20th century Mumbai became established as an important industrial center, with the textile industry dominating its economy. The industry developed on the outskirts of the then populated areas in Central Mumbai. In the post-Independence period, Mumbai's industrial base was diversified with the growth of pharmaceuticals and chemical industries, and a large number of industries producing consumer goods and engineering products. These were located in an extensive suburban manufacturing zone extending from Vikroli and Bhandup in the east to Andheri and Goregaon in the west. Automobile production along with its ancillary industrial units was an important component. Petro-chemical and chemical industries developed in suburban areas such as Chembur-Trombay, Mulund within the city and the areas close to it known as Thane-Belapur belt. Although there was a localization of drugs and pharmaceuticals, the textile industry continued to be the major industry in terms of both output and labour force, employing about 250,000 workers in nearly 60 mills until the early 1980s (Whitehead, 2008). After the late 1970s, though, the manufacturing sector in Mumbai began to decline overall, while the marked decline in manufacturing in the core led to an increase in manufacturing activities outside it (Whitehead 2008). Over the years, this also gradually shifted some population to the periphery which is evident in the changes in the migration pattern in the Mumbai UA.

The de-industrialization of Mumbai was caused by a number of factors that have been identified as follows (Nijman, 2000; Soman, 2002; D'Monte, 2002; Whitehead, 2008; Sharma, 2010):

1. The industrial policy of the government, which encouraged establishment and expansion of industries in backward areas, and shifting of the polluting industries to the peripheral areas due to environmental and pollution control regulation.
2. Bias against the organized sector in the government's taxation and other policies,
3. Relatively high costs of inputs like electricity, water and transport,
4. The militancy of the labour movement in the 1980s,
5. High property prices in the city.

These specific factors bearing on Mumbai's de-industrialization were clearly important; however, the de-industrialization, while it certainly could have been slowed, may have been inevitable. It has been argued on the basis of enormous manufacturing job losses in cities such as New York and Tokyo since the 1970s that de-industrialization is a natural, inexorable process in such major cities (Sassen, 1993),

The decline of manufacturing is most evident in Central Mumbai, where a number of textile mills have become 'sick'. As D'Souza (1997) points out, this is an area where at present vast spaces are underutilized. City planners are turning their attention to the 'recycling' of the mill lands and various proposals are under consideration. At present, a few piecemeal attempts at gentrification have resulted in tall skyscrapers developing side by side with the slums. In fact, the heart of the textile area has witnessed the entry of shopping arcades, bowling alleys, and other up-market developments.

In the manufacturing sector, it is not only the traditional industries that have suffered. The chemical industry which was hailed a decade ago as a 'sunrise' industry has suffered due to liberalization and opening up of the economy to competition.

Mumbai, as mentioned earlier, owed its initial growth to its function as a major port. In fact, the Port Trust owns vast stretches of coastal land. With the development of a new port called JNPT in Navi Mumbai, which is better equipped to handle container traffic, the export/import functions of the old Mumbai port located within the precinct of MCGM have been on the decline. The decline in the manufacturing sector accompanied by increasing informalisation of jobs has affected a large section of Mumbai's population. These two processes have brought about significant changes in the functional characteristics of Mumbai in recent decades since the time it had evolved during the colonial phase as a major port city and a center of trade and commerce. The declining manufacturing sector, most prominently seen in the cotton textile sector and the port activities in Mumbai, led to the growth of the service sector within the core of Mumbai. The liberalization policies pursued in India since 1991 have further strengthened the service sectors (Grant and Nijman, 2002:16).

The emergence of Navi Mumbai during the 1970s has affected the commercial core of Mumbai located in the island city. Mukhopadhyay (2003) has highlighted the decline of both the wholesale and retail functions between 1980 and 1995 because of the shift of wholesale markets to Navi Mumbai. She draws attention to the emergence of semi-wholesaling, godown and container services and the need for a massive urban renewal and restructuring of functions outside MCGM.

Due to the decline in manufacturing activities, the majority of people in the Core work in the service sector which includes transport, communications, social and personal services besides real estate, construction, banking, financial and IT sectors. The process of change also led to increasing concentration of jobs in the unorganized sector which are casual and erratic in nature.

By the end of the 1990s, the unorganized sector accounted for two-thirds of the jobs in Mumbai (Sundaram, 1997). Several researchers attribute the decline in formal sector employment to the decline in manufacturing industries and the inability of the service sector to fill this void (Sita and Bhagat, 2007). The decline in the organized sector and the rising

unorganized sector could not generate enough growth in total employment, and the rate of growth in employment slowed down significantly (Urban Age 2007; Shaban 2010). This has certainly affected the population growth and migration trend and pattern in the MMR region.

Trend and Pattern of Migration

Mumbai has grown through migration over the years, but the trend and pattern of migration has undergone a significant change. In the late 19th Century and the early twentieth century, Mumbai's population mainly consisted of people born outside Mumbai (Sedgwick, 1922). Based on place of birth statistics, the percentage of migrants in Mumbai's population was as high as 80 percent at the beginning of twentieth century, gradually declining to 43 percent by 2001 (see Fig. 7). Earlier migrants came mainly from erstwhile districts of Bombay Presidency, namely Rantagiri, Colaba, Thane, Poona, Satara and Ahmad Nagar districts and also from Gujarat (mainly from Kutchch, Kathiawad, Surat and Ahmedabad) which was also part of

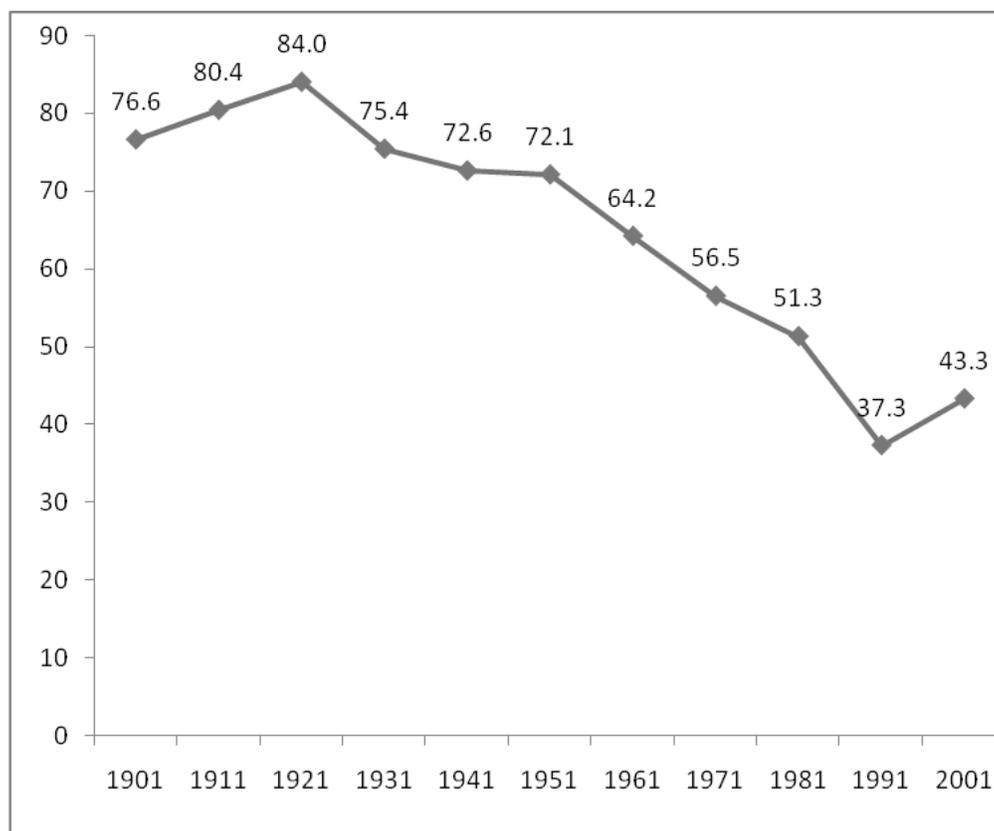


Fig. 7. Percentage of Migrants in Mumbai UA, 1901-2001

Source: Migrants are defined based on place of birth. Figures up to 1961 are taken from Zachariah (1968: 45). For the remaining census years, see the respective Migration Tables, Census of India, 1971 to 2001.

Bombay Presidency. Among the various districts, Ratnagiri which is situated adjacent to Mumbai to the south was the main supplier of migrants to Mumbai City. Migrants also came in large numbers from Portuguese and French possessions in India (Sedgwick, 1922).

The virtual lack of any growth during 2001-2011 in the Core of Mumbai (MCGM Area) resulted from a decline in migration as well as a decline in fertility in Mumbai to below replacement levels (TFR 1.68 in 2005-06) (International Institute for Population Sciences, 2009:95). The declining share of migrants in the total population of Mumbai UA has been accompanied by considerable change in the source regions of the migrants. The most noticeable change over the last fifty years was a considerable increase in the share of migrants from the northern state of Uttar Pradesh, which shows an increase from 12 per cent in 1961 to 24 per cent in 2001, and from Bihar, from 0.2 per cent to 3.5 per cent. On the other hand, the share of migrants from the states of Gujarat and Goa continuously declined over the same period - from 16.9 per cent to 9.6 per cent, and from 3 per cent to 0.6 per cent, respectively. The increase in inter-state migration, mainly from Uttar Pradesh and Bihar, was paralleled by a decrease in the share of within-state migration. The share of migrants from Maharashtra to Mumbai declined from 41.6 per cent in 1961 to 37.4 per cent in 2001. It is important to note that the virulence of anti-migrant agitation in the name of 'Sons of Soil' politics and associated violence in Mumbai during the last two decades of the 20th century and its resurgence through the emergence of a political party named *Maharashtra Nav Nirman Sena* (MNS) during the 2000s has been associated, not with increasing migration in Mumbai, but with the shift in the migration pattern in favour of inter-state migration.

Migration has also been shifting to peripheral areas of Mumbai UA. Migration is defined on the basis of change in the place of residence. This may take place within the district, between the districts and between the states. Within the district any change of residence across municipal as well as village boundaries is defined as migration. The MMR is spread over four districts. Two districts, namely Mumbai and Mumbai Suburban, which together constitute MCGM, fall completely in the MMR and another two districts, namely Thane and Raigarh, fall partly in the MMR outside the MCGM. The census provides data on migration only up to the district and UA levels. It is therefore possible to disaggregate the migration pattern for Mumbai UA (i.e. Core plus Inner Zone), but not for the entire MMR. The available data show the markedly higher proportion of migrants living in the Inner Zone both for males and females in recent years. Male migrants with duration less than 10 years were about 32 per cent in the Core compared to 45 per cent in the Inner Zone. Similarly, for female migration these figures were 30 and 45 per cent respectively.

It is also observed that more never married migrants of both sexes live in the Inner Zone compared to the Core. Fifty seven percent of male migrants in the Core were never married compared to 61 per cent in the Inner Zone. Similar figures for females were 33 and 36 per cent respectively. Not only were recent migrants a higher proportion of the population in the Inner Zone but also a higher proportion of them are single and of younger ages. This shows the geographical shift of migration from the Core to the periphery, and is consistent with higher population growth in the peripheral areas of the Inner Zone of MMR.

It is possible to estimate the contribution of natural increase and net migration to the growth of population in the different zones of MMR for the last two decades, based on birth

and death rates of Mumbai (MCGM) and urban Maharashtra (see Table 4). The contribution of migration to population growth in Inner and Outer zones was estimated to be about 71 and 78 percent respectively in the decade 2001-2011 which lower than the previous decade. By contrast, the Core has shown a net out migration during the decade 2001-2011, which depleted the growth resulting from natural increase. The natural increase in the Core was estimated to be 850,000 during 2001-2011, out of which in net terms about 350,000 migrated away from the Core, mostly to the Inner and Outer Zones. This means that both inner and outer zones of MMR have been not only receiving migrants from outside the region but also from inside as spillover from the Core. This is natural for an expanding metropolis (it was also a key feature of trends in the MURs studies by Jones and Douglass, 2008), because the core is densely populated, accommodation is not easily available at an affordable cost, and manufacturing jobs are shifting to areas outside the core. Enhanced connectivity through improved transport facilities also facilitated the redistribution of population from the Core to the Inner and Outer Zones; commuting from areas outside the core means that the daytime population of the core is substantially larger than its nighttime population.

Migration is generally linked with growth of slums in Mumbai. There is a huge slum population in the Mumbai Metropolitan Region, predominantly concentrated in the Core i.e. the area of MCGM. There are more than 2000 slum settlements dotted all over Mumbai crammed between commercial complexes and middle and upper class localities (Sharma, 2010). Thus, one of the remarkable features of Mumbai's social fabric is that unlike many European and American cities, rich and poor neighborhoods are not segregated but coexist.

Migration, Slums, and Housing

The Slum population, which constituted 54 percent of the population according to the 2001 Census in Mumbai City (MCGM), hugely declined to 41.8 percent (5.2 million) in 2011. A large number of slum pockets are dotted across the city, but more concentrated in the western and eastern suburbs within the jurisdiction of Mumbai MCGM along the railway tracks. Although slums have grown through migration, they are also growing due to natural increase. In 2005-06, among the slum population, about 45 per cent of male and 53 per cent of female adults (age 15-49) were migrants and nearly two-fifths of them entered the city during the last 5 years (International Institute for Population Sciences, 2009:90).

Cotton textile and factory owners, railways and the Bombay Improvement Trust used to provide housing to their workers in close proximity to the work places (Bhowmik 2011:78). These housing complexes were known as *chawl*⁸. However, the decline in the formal sector and the rapidly rising informal sector since the early 1980s forced the migrant workers to seek their own shelter. Migrants provided cheap labour to the city, but could not afford housing due to its exorbitant prices compared to their income levels. The average per capita annual income was Rs 65,361 at current prices in 2006-07 (Municipal Corporation of Greater

⁸A chawl is a building often with 4 to 5 stories with about 10 to 20 tenements having one or two rooms with shared toilets in each floor. The construction of chawls began in the early 19th century to house the people migrating to Mumbai because of its booming cotton mills and overall growing economy.

Mumbai 2009:40), or average monthly earnings as low as 5000 to 6000 rupees (less than 150 US Dollars). On the other hand, official statistics reveal a dismal picture of at least 1.2 million i.e. close to 10 per cent of total population of Mumbai (MCGM), reporting incomes of less than Rs. 592 per month (less than 15 US Dollars) (Municipal Corporation of Greater Mumbai 2009:44). With such a low income, formal housing of a 600 square feet flat is unaffordable as it cost around 30,000 US Dollars in the suburban areas of Mumbai (MCGM) a few years back (Sharma 2007:289). The price has escalated further in recent years to about 100,000 US Dollars in 2013 (The Times of India, 2013:1). Given their extremely low income, the majority of the population continues to live in slums. On the other hand, newer and better off migrants, who can afford a flat, seek cheaper housing in the far off areas outside the Mumbai MCGM, within the metropolitan region and as close as possible to the MCGM.

The housing constraints in Mumbai's core (MCGM) were a major reason for the gradual shift of population to the peripheral Inner and Outer zones in the Mumbai Metropolitan Region. However, in spite of the rise in the share of population in the periphery, the majority of the MCGM population still lives in slums.

A new slum redevelopment scheme was launched in the late 1990s under which free housing is promised to bonafide slum dwellers who could prove they have been staying in Mumbai (MCGM) on or before 2000. A Slum Regulatory Authority (SRA) was also created to plan, monitor and implement this scheme in 1995. The fact that the majority of the population continues to live in slums even in 2011 indicates that the new slum development scheme has not been successful. Under the new scheme, the developers are provided extra FSI (floor space index) for sale in the market in order to cross-subsidise free houses given to the slum dwellers. Although the scheme is new and innovative, it suffered from various problems like loss of livelihood, increase in cost of living, quality of housing and corruption. As a result, there was wide spread resentment against the scheme and its non-acceptability by the slum dwellers (Gandhi 2007; Bhowmik 2011).

Discussion and Conclusions

Mumbai experienced a significant transition during the 1980s, which had much to do with the closure of the textile mills, followed by prolonged strikes by textile workers. Subsequently, there was also a large-scale relocation of engineering, chemicals and pharmaceutical industries outside the Core in the MMR. The de-industrialisation of Mumbai in the 1980s and 1990s was so prominent that it has now become a city dominated by the services sector. The low-wage service sector could not absorb more unskilled migrant workers. This is well reflected in the population figures released by the 2011 census for Mumbai (MCGM). The new figures show that the population growth of Mumbai (MCGM) has slowed to less than 0.5 per cent per annum during 2001 to 2011; in terms of actual numbers, the population has grown marginally from 11.9 million in 2001 to 12.4 million in 2011. This slight growth in population has occurred only in the suburbs; there has actually been a decline in the population of the Island City. The percentage of population living in slums has declined from 54 per cent in 2001 to 41.8 per

cent in 2011 which is consistent with the decline in migration to the Core of the MMR, but at the same time it reflects that housing conditions in Mumbai have not improved during the last decade.

In the areas outside the Core, population has grown faster, but there too the growth rate is slowing. Migrants are predominantly located in the peripheries. There is also a change in the composition of migrants in favour of interstate migration. There is a resurgence of *Sons of the Soil* sentiment in Mumbai, stemming partly from the change in the composition of migration in favour of those arriving from outside the state of Maharashtra.

Despite all the talk of “world class” city status, the real challenge for Mumbai is to deal effectively with joblessness, homelessness and poverty. In particular, how are its six million slum dwellers to be provided decent housing and improved quality of life in terms of access to sanitation, safe drinking water and health care? The problems of Mumbai are also linked with the problems of adjoining cities, like Thane, Kalyan, Navi Mumbai and Mira Bhayander. The planning should not be confined to Mumbai city, but needs to encompass the whole of the Mumbai Metropolitan Region. This could be done by a Metropolitan Planning Committee, whose role and functions are clearly laid down in the 74th amendment of the Constitution on urban local bodies. The irony of Mumbai lies in the fact that there are several planning and administrative authorities in the MMR. Each one has the responsibility of preparing a development plan, but this needs to be effectively integrated by a functional and empowered Metropolitan Planning Committee. This needs to be done by the state government because urban development is a state subject in India.

The last decade has seen an ongoing debate on the future of Mumbai and its planning for development. The idea that Mumbai should become Shanghai or Singapore is very appealing to policy makers, the elite and people in the corridors of power. However, over the years, any kind of urban planning process has been ignored in Mumbai. The state government has arrogated to itself all initiatives and all thinking in regard to urban development, eroding entirely the function of the municipality (Patel, 2005). The real challenge before Mumbai is to provide affordable housing to the majority of its population with a very low level of income living in inhospitable slums. The issue is not access to housing alone but also the sustainability and security of income and livelihood of the slum dwellers. Effective local governance backed up by bottom-up planning could perhaps provide some solutions and help in fulfilling the needs of the majority of the people living in woeful conditions.

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