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Mumbai after 26/7 Deluge: Issues and Concerns in Urban Planning

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Abstract There has been euphoria among the government circles recently to develop Mumbai as a world-class city before the 26/7 floods hit the city. The cities like Shanghai or Singapore were often cited as benchmarks for planning and development of Mumbai in the next decade. However, the dream has been shattered by the unprecedented flood of July 26. Lack of urban planning, unprecedented rains and the failure of the early warning system are some of the important factors for the tragedy. It is the time that Mumbai's planning and developmental discourses can be unshackled from an illusion of Shanghai or Singapore.

Keywords Mumbai · Metropolis · Vision · Density · Deluge

Introduction

The incessant and torrential rains in the afternoon of 26 July 2005, amounting to 94.4 cm during a span of only 14 h not only caused deluge in Mumbai, but was also a horrifying memory for every Mumbaikars. It has disillusioned the common people from their city known as Aamchi Mumbai (our Mumbai) and has shattered the elite's imagination of Mumbai turning into Shanghai in the near future. The deluge brought a new perception about the city and kicked a debate concerning the planning and development of Mumbai in the coming decades. Recently, it has been brought to the notice that Mumbai is losing its importance in Maharashtra as well as in the country. The economic growth rate in Mumbai has slipped to about 2% compared to the growth rate of 6% in Maharashtra and little over 6% in India during the last decade (Sharma, Bhagat, & Rath 2003). This concern in economic decline in the commercial capital of the country is believed to have occurred because

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the state and the central government have not adequately invested in the city, even though, it contributes disproportionately to their total revenue. It is being emphasized that this is an injustice to Mumbai and pleads for more investment from the government sources. The recently prepared document called the "Vision Mumbai" proposes an investment of $40 billion from both private and government sources and assigns the leading role to the Chief Minister in the mobilization of this massive investment in the next decade (Bombay First-Mckinsey Report 2003).

Why did Mumbai see the ill-fated day of 26th July? There are many arguments behind such macabre. Among them a few important are unplanned development of the city, reclamation of low lying areas, negligence on the part of Brihanmumbai Municipal Corporation (BMC) in cleaning sewers and drainages, builders' lobby encroaching the areas of hills and mangroves, irresponsible city dwellers' disregard for their streets, lanes and sewers, violation of coastal regulation zone (CRZ) rules, choking up of the Mithi river providing natural drainage to the city, lack of disaster preparedness, too many people migrating into the city, the presence of multiple administrative and development agencies like BMC, Mahanagar Telephone Nigam Limited, Mumbai Metropolitan Region Development Authority (MMRDA), Maharasthra Housing and Area Development Authority (MHADA), etc., with no clear coordination among them.

An inquiry into the handling of the 26/7 floods, conducted by the National Institute of Disaster Management at the request of the Union Home Ministry has revealed the negligence and gross lack of awareness on part of the authorities supposed to manage disasters under the detailed plan prepared for the city. This report has blamed the lack of urban planning for the floods. Thus, the haphazard growth, unprecedented rains, and the failure of the early warning system, together created this situation. The inquiry has also revealed several shortcomings. First, the officers and agencies meant to take charge were themselves hit. The plan had not taken this possibility into account. This was further aggravated by poor damage assessment, hence, inadequate response. Then, there was no functioning communication system, even among agencies (Sinha 2005). In this paper, we have tried to categorize and address some of the issues related to the planning and development of Mumbai in the light of the deluge of 26/7.

Natural Cause: Rain

The unprecedented rain was the result of an 'offshore-vortex'—a heavy downpour but extremely localized, spread over as little as 30 km^2. Forecasting of such meteorological phenomenon is not possible without Doppler Radars that the State Metrological Department is yet to procure (Kanate 2005a,b). Experts opined that the phenomenon was unusual for Mumbai where cloud column reached as high as 15 km on that day, crossing the usual column height of 6–7 km. The dangerous offshore-vortex was formed when moisture laden strong wind came in from the Arabian Sea but ran into an obstacle in the form of the Western Ghats. Unable to cross over directly it began flowing in a channel from the side, slightly northward of the Western Ghats, leading to the formation of a wedge. This wind trough became a vortex when the winds took a 360° turn. The low-pressure area over the central Madhya Pradesh had made the vortex deadlier. Though the amount of rain was similar to a cloudburst, but it was different as the vortex was constantly fed with moisture from the Arabian Sea, which made it more lethal and prolonged. In a

cloudburst, it is the collected moisture that results in heavy rain. But here the vortex was so localized like a cyclone that only the north Mumbai and its suburbs bore the brunt (Jain 2005).

The abnormally high rainfall on 26/7 is very much evident from Table 1, which portrays the average annual rainfall in the city. While the whole month of July usually receive 946 mm rain, the city experienced more than 946 mm rain on the day of 26/7, which has given Mumbai a distinction. The city is now ranked at par with Cherrapunji and Mawsynram in the Top-10 list of places registering the highest rainfall on a single day, since 1876 (Table 2). Seven spots are hilly stations, whereas, three are located in the plains. Mumbai comes second among the regions in the plains to have received the highest rainfall on a single day while Dharampur, in Gujarat, stands first.

Climatic conditions in the region like the directions of winds flowing in the Arabian Sea have also undergone a severe change over the last century. During the first three decades of the 20th century, the average maximum rainfall recorded in a day in Mumbai was 30 cm, which went up to 50 cm by 1970. Thereafter, Mumbai has been recording—albeit, erratically—ever more rain in a single day as is apparent in the report of the Indian Institute of Tropical Meteorology (IITM), Pune from 1876 onwards. Experts also opine that 26 July 2005 is not the only threat faced by the city, which is in the midst of a changing weather system but can, at any time, be accompanied by killer winds and towering tides.

Therefore, the need of the hour, according to the IITM, is to create an exclusive and efficient system of disaster forecasting and management for Mumbai (Kanate 2005a,b). This includes installing of a Doppler Radar to monitor cyclones and cyclone-like conditions. The High Court has ordered that the Doppler Radar may be installed at a suitable place (Ghosh 2005).

Human Cause

The land-use of the city shows that the concrete city has pushed nature to the margins. There has been a marked increase in the built up area, which has mainly expanded along transport corridors with improved connectivity. Simultaneous with increased concretization has been the drastic reduction in the green zones and open spaces, which are effective carbon sinks and dust filters helping to keep down pollution levels (Srivastava and Mukherjee 2005, p. 3906). Although the central forested area has helped to preserve some of the forest cover within the city, yet opening up of large area for construction has led to the peripheral areas becoming degraded into scrublands. Several hills are non-existent today, whereas, bare rocky outcrops are becoming prominent. Even mangroves, which act as the city's sponges and support an impressive ecosystem, have shrunk from 235 km^2 in 1924 to 160 km^2 in 1994 around Mumbai and Navi Mumbai. An additional 1000 ha are estimated to have

Table 1 Average annual rainfall in Mumbai

	January	February	March	April	May	June	July	August	September	October	November	December
mm	0	1	0	0	20	647	946	660	309	117	7	1
in.	0	0	0	0	0.8	25.5	37.2	26	12.2	4.6	0.3	0

Source: Adopted from Ref. Ghosh (2005).

Table 2 Top-10 places registering highest rainfall in a single day since 1876

Station	State	Altitude (m)	Rainfall (cm)	Date
Cherrapunji	Meghalaya	1313	103.6	14 June 1876
Jowai	Meghalaya	1390	101.9	11 September 1877
Cherrapunji	Meghalaya	1313	99.8	12 July 1910
Mawsynram	Meghalaya	1401	99.0	10 July 1952
Dharampur	Gujarat	38	98.7	02 July 1941
Cherrapunji	Meghalaya	1313	98.5	13 September 1974
Cherrapunji	Meghalaya	1313	97.4	21 June 1934
Cherrapunji	Meghalaya	1313	97.0	12 September 1974
Mumbai	Maharashtra	14	94.4	26 July 2005
Hashimara	West Bengal	115	92.8	21 July 1993

Source: From Ref. Ghosh (2005).

been destroyed by the year 2000 and much of them in violation of the CRZ rules (Sekhar 2005). Wetland and forest that used to cover 28 and 60%, respectively, of the total land-use of Mumbai in 1924 has come down to 18 and 30% in 1994. During the 60 years period from 1924 to 1994, the build up areas of the city has increased fourfold from 12 to 52% (Sekhar 2005). Six drainage basins in Mumbai are gradually chocking due to construction of roads, buildings, and encroachment of slum areas. The six main natural drainage systems of Mumbai metropolis are heavily getting chocked up largely due to the construction of concrete jungles, as evident from Table 3. Basin 4, 5, and 6 as given in Table 3 are worst affected, covering the vicinity of Jogeshwari to Kandivali and the region around Mithi river, which were worst hit during the 26/7 downpour.

Mithi river, a 14-km long channel that flows from Tulsi–Vihar–Powai lakes through Kalina–Kurla to Mahim creek and which once upon a time acted as a storm water outlet of the city has turned into one of the dirtiest drainage filled with mud, sludge, etc. (Fig. 1). In 1994, the National Environmental Engineering Research Institute and the Indian Institute of Oceanography submitted a joint report on the improvement of the river. After that two more reports have been submitted and all the drafts warned about the ineffectiveness of the river as a rainwater outlet due to severe pollution.

The water of the Mithi river is so polluted due to constant disposal of industrial and hazardous waste as well as garbage and raw sewage that it is a threat to marine life. It has turned into one-third of its size due to reclamation of Bandra–Kurla complex. Moreover, a large mangrove patch that provided a natural barrier against flooding was illegally reclaimed in between the river and the complex. The damage, human loss, and transport disruptions that Mumbaikars faced due to heavy rain would have been much less, if steps were taken on time to rejuvenate the river. The

Table 3 Major drainage basins in Mumbai

No. of basins	Flowing into	Area (km^2)	Built up (%)
1	Vasai creek	8.98	43
2	Vasai creek	27.20	10
3	Manori creek	37.44	8
4	Malad creek	16.56	49
5	Malad creek	24.21	50
6	Mahim creek	42.07	54

Source: From Ref. Sekhar (2005).

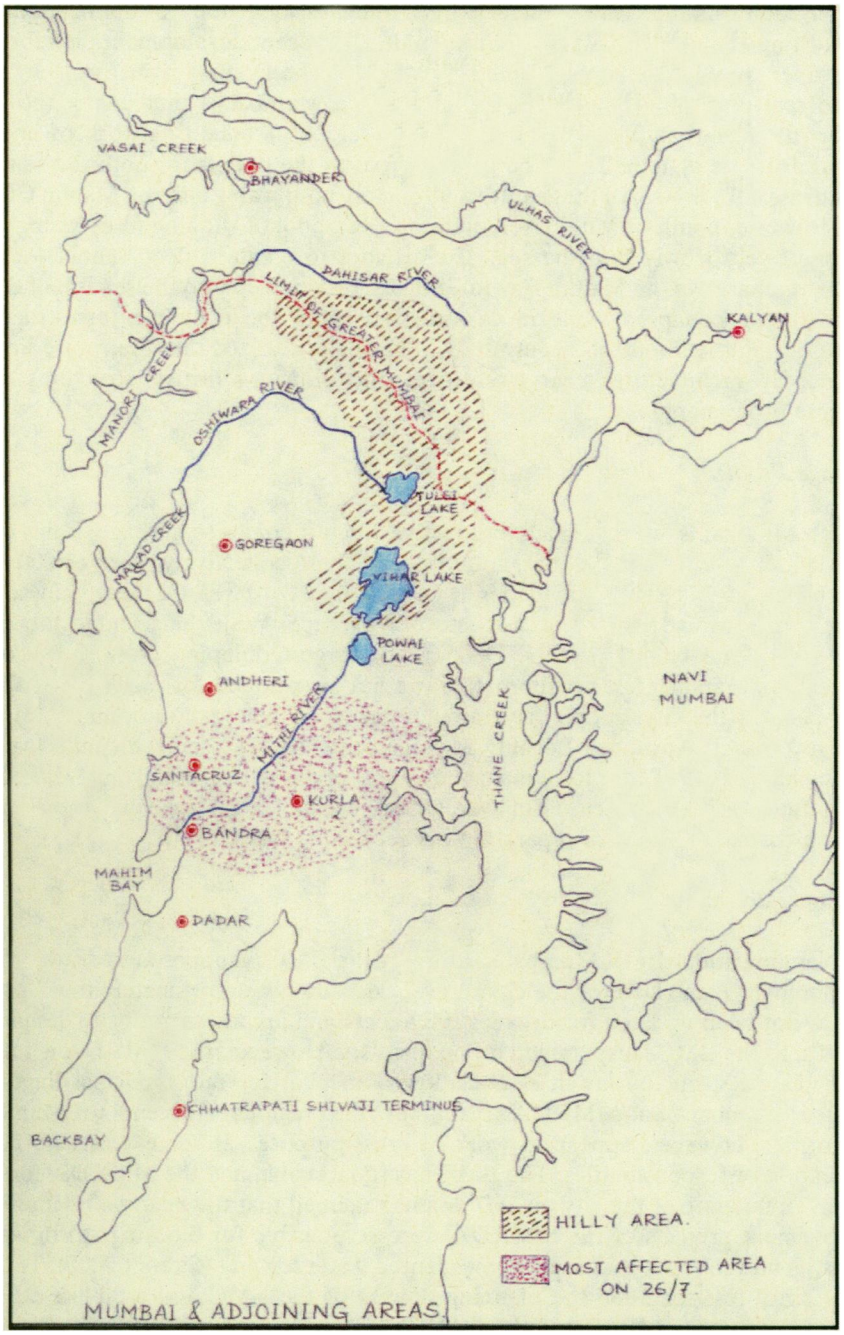

Fig. 1 Mumbai and adjoining areas

Dahisar river, another natural drainage of Mumbai is no better. The river is a hutments huddling gutter near the National Park area. In fact none of these rivers have the capacity to carry natural rain water flows, but have turned into nallas,

garbage dumps, and gutter ditches over the decades due to built up areas encroaching them on all sides. The Chief Minister's recent development plan for the Mithi river needs to be supplemented with one for the Dahisar river too.

The real crux of the poor drainage system in Mumbai is that unlike the city proper, the suburban Mumbai has not yet developed a sound network of underground drainage system. The open gutters serve as the outlets for both the sewage and storm water flows. All these gutters ultimately pour water into the Mahim Creek just below the mouth of Mithi river, creating a cesspool of stinking filthy water that drains off very slowly into the sea. The attempt to create a deep tunnel for the sewage discharge in the Mahim Bay to be taken 10 km deep into the sea is half done as the tunnel collapsed while in construction. With the complete infrastructure failure during the floods of 26 July 2005, it has been realized that the future lies in eco-friendly architecture, energy-sensitive, and climate-sensitive structures that consume little energy.

Garbage Problem

Though Mumbai is phenomenally productive when it comes to garbage, it has only three landfills—at Gorai, Deonar, and Mulund. These collectively receive 8000 ton. of garbage daily. The city is divided into six zones and 24 wards. Of these, only seven wards carry out segregation of wet and dry garbage. With the average life of a dumping ground being 30 years, Deonar, the largest dumping ground, has only 5–6 years left, and so far, no alternative site has been found for waste disposal. In some parts of the city, people have already taken on segregation of wet from dry garbage through Advanced Locality Management (ALM), a citizen's initiative, in partnership with BMC, for local management of solid waste. Presently, there are 783 ALMs functioning in the city. But segregation levels of waste are very low, as only 2% of citizens are aware of separating out recyclable waste (Pujari 2005).

Administrative Cause

The planning authority of Mumbai, essentially the BMC is supposed to draw-up the Development Plan (DP) for the city in every decade but unfortunately the existing DP has not been updated for decades. Engineers and architects basically design all the DPs, as the BMC lacks trained urban planners. However, the MMRDA is full of urban planners, but by law it is not allowed to plan for the municipal limits of Greater Mumbai. So MMRDA plans for the regions adjacent to Mumbai. Authorities, however, appear to work at cross-purposes as there exists no clear delineation of responsibilities. The BMC has squarely blamed the MMRDA for the disastrous flooding of the city on 26/7 and has claimed that the nearly 40 unfinished improvement projects of the MMRDA were responsible for blocking storm water drains on all the roads that saw unprecedented water logging (Sawant 2005). Thus it is necessary to strengthen the planning powers of the BMC and establish a good understanding of the BMC and the MMRDA in urban and urban fringe planning. Under the 74th Amendment of the constitution in early 1990s, a metropolitan planning committee comprising of both states legislators and municipal corporations was supposed to have been set up to plan for the city, although it has not yet happened. As a consequence there exists no dynamic plan for the most populous mega city of India.

As opined by Hamine (2005), the BMC is planning to increase the number of municipal wards from 24 to 30. A few of the existing wards will be split into two or more parts and some will be redesigned. The civic body is in the process of adding 2500 employees at various levels, including clerks, engineers, legal assistants, and health assistants. A three-phase action plan to clean up the Mithi river within 2 years could solve two-thirds of the problems plaguing the river, if implemented without any political pressure. In the 26/7 deluge, encroachments along the river bank had augmented the inundation of large areas of Saki Naka, Kalina, Santa Cruz, and Kurla. Although the widening of riverbed to 50 ft at most places may not be possible, the authorities can ensure desilting to increase the depth. Not more than 1200 slums at about eight places along the riverbed will have to be relocated. As the MMRDA has been involved in construction of the Bandra–Kurla complex where the flow of the river has been diverted, the agency should now be asked to finance the scheme for protecting the river. The BMC has officially identified 13 chronic flood spots across the city. However, it does not have any data or solution to the problem that leads to water logging in these areas (Hamine 2005).

At the end it should be admitted that the Mumbaikars too have the responsibility to make the city cleaner and better instead of only blaming Government bodies whenever something goes wrong. It is not only the slum dwellers who throw plastic bags; even the elites do the same. The disaster-management plans talk of the involvement of ALMs. Forming ALMs is the first step toward good governance as it can bring order in small areas. The solution of any problem is to meet, discuss, and resolve issues together instead of blaming one another.

Visioning Mumbai in 21st Century

A seminar on 'Vision Mumbai' was held at the Tata Institute of Social Sciences, Mumbai on 9 December 2003. The vision document was intensively debated and attributed to be the elitist by the participants belonging to the world of academics, administration, and the NGOs, etc (Sharma et al 2003). Nevertheless, the document continues to be important in shaping the perception and thinking of the state government about the future of Mumbai. It promises to fulfill the aspirations of the powerful sections of the Mumbai city ignoring that more than half of Mumbai's population lives in slums.

It is an accepted fact that the planning of a city is not free from ideology. In fact, city planning is a political process of restructuring city space causing benefits to some groups, while loss to others. Looked this way, building of sky scrappers, high and express ways, flyovers, air ports, recreational spots and parks, etc., have important implications for those who live in the city—their access to opportunities and their share of sufferings. We can critically analyze the rationale for 'Vision Mumbai' in the context of demographic dynamics, as population is the most important determinant behind all urban plans.

The vision document strongly believes that building a good infrastructure of road, railways, and airport in the city can boost economic growth. It further views that building up and maintaining good infrastructure in the city is possible through increased participation of the private sector. This is evident in the proposed privatization of the international airport of Mumbai and also for solving the housing problems through massive construction by builders.

Philosophically the vision is based on the neo-classical growth theory of development arguing that an unshackled market force integrated with world economy has clear advantages for both the rich and the poor. Thus, the concerns like housing and water supply, though important, will be taken care of by the growth process. Looked from this perspective, slums in Mumbai are not the problem but provide an opportunity of economic growth through private participation in the building activities. As land is very scarce in Mumbai, slum lands are very valuable to the builders who can erect multi-storied buildings if Government permits them to increase Floor Space Index (FSI). This will cross-subsidize the housing for the slum-dwellers. Therefore, the entire vision document envisages the virtue of economic growth based on market forces supported and facilitated by the government. This is very consistent with the current policies of liberalization and globalization of the Indian as well as world economies.

While the academicians and social activists are contesting the philosophical moorings of globalization and privatization ideologically and empirically at the national level, the 'Vision Mumbai' document spurred a debate on the future of Mumbai city. It is argued here that planning for a city like Mumbai for the next 10 years must take into consideration the following aspects, which the 'Vision Mumbai' document did not take into account.

Defining Mumbai

At the first instance, the geographical entity of Mumbai seems to be non-problematic. But there is a need to understand today what constitutes Mumbai in order to solve its problem in the larger context and to find a sustainable solution. The 'Vision Mumbai' document adopts a very narrow definition of city defined by the municipal boundary popularly known as the BMC. Internationally, the definition of city has its roots in the concept of Urban Agglomeration (UA) (Champion 2004). An UA is defined based on the functional linkages and interdependencies between a main city and its adjacent urban centers. The Census of India, which provides population data on cities and towns, has demarcated the Greater Mumbai UA consisting of BMC, Thane (Municipal Corp.), Kalyan–Dombivili (Municipal Corp.), Ulhasnagar (Municipal Corp.), Mira-Bhayander (Municipal Council) and Navi-Mumbai (Municipal Corp.). One would also like to add Vasai and Virar in Mumbai UA. Any long-term planning for the city cannot ignore the changes taking place in these adjacent towns.

Demographic Size and Growth by 2013

The Greater Mumbai UA is the largest in India in terms of population and in fact, has the distinction of being one among the largest cities of the world in this respect. In 2001, the population exceeded 16 million with the BMC alone contributing to nearly 12 million. The main satellite towns, each of which has a population exceeding one million, are Kalyan–Dombivli and Thane. The other satellite towns are Navi Mumbai, a planned town established three decades ago, Mira-Bhayander and Ulhasnagar. Table 4 shows the population and decadal growth rates of Greater Mumbai UA that incorporates Mumbai Municipal Corporation along with the city suburbs and the satellite towns mentioned above. The growth of the city core has declined substantially and the rate has become negative after 1981. The tremendous growth of the suburban areas that were worst hit by the 26/7 rain has actually made

Table 4 Population size and decadal growth rates of Mumbai UA and its constituents

Name of UA and its constituents	Population (lakhs)						Growth rate (%)				
	1951	1961	1971	1981	1991	2001	51–61	61–71	71–81	81–91	91–01
Gr. Mumbai UA	32.17	45.15	65.92	94.22	125.96	163.68	40.37	45.98	42.94	33.69	29.94
Gr. Mumbai Municipal Corp.	29.67	41.52	59.71	82.43	99.26	119.14	39.95	43.80	38.07	20.41	20.03
Mumbai suburb district	6.65	13.80	29.00	49.58	67.51	85.88	107.41	110.14	70.97	36.15	27.20
Mumbai district	23.29	27.72	30.70	32.85	31.75	33.27	19.02	10.77	6.99	–3.35	4.79
Thane municipal corp.	0.74	1.09	2.07	4.32	8.03	12.62	46.97	89.86	108.18	86.11	57.02
Kalyan–Dombivli Municipal Corp.	0.89	1.39	2.35	4.40	10.15	11.93	57.61	68.24	87.28	130.84	17.61
Ulhasnagar Municpal Corp.	0.81	1.07	1.68	2.73	3.69	4.73	33.27	56.33	62.45	34.86	28.14
Ambarnath Municipal Council	–	–	–	Merged	–	2.04	–	–	–	–	–
Badlapur Municipal Council	–	–	–	in Kalyan Municipal Corp.	–	0.98	–	–	–	–	–
Mira-Bhayander MCI	0.06	0.07	0.11	0.26	1.76	5.20	10.23	51.96	141.99	584.73	196.29
Navi-Mumbai Municipal Corp.	–	–	–	–	3.08	7.04	–	–	–	–	128.76

Note: (1) Kalyan–Dombivli Municipal Corp. for 1981–1991 includes Ambarnath and Badlapur MCIs.

(2) The decline in growth rate for Kalyan–Dombivli Municipal Corp., during 1991–2001 is due to the bifurcation of Ambarnath and Badlapur MCIs from Kalyan–Dombivli Municipal Corp.

Abbreviation: UA: Urban Agglomeration; *MCI*: Municipal Council.

Source: From Ref. Registrar General of India (2001).

the city grow. However, the total growth rate is coming down as evident during the last 30 years.

Nevertheless, the growth rate of Greater Mumbai UA is significantly higher than that of the BMC, indicating the faster growth of satellite towns, as shown in Table 4. The growth rate of the UA has however, declined during 1991–2001 compared to the previous decade, while that of the city has remained approximately the same. The growth rates of both the major satellite towns, i.e., Kalyan–Dombivli and Thane have shown a marked decrease compared to 1981–1991. This is partly due to administrative reorganization. The fastest growing satellite towns in 1991–2001 were Mira-Bhayander and Navi Mumbai. 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 70s of the last century took-off during the last decade due to the completion of mass transport links with the main city as well as improvements in infrastructure.

It is no doubt that the influx of migrants into Mumbai UA is increasing. It has increased from 4.4 million in 1991 to 7.1 million in 2001 (migrants defined on the basis of place of last residence). However, the migrant population still constitutes less than half of the population of Mumbai UA. Further, nearly half of them come from the state of Maharashtra only (42% in 2001).

A noteworthy characteristic of population distribution within Mumbai UA is that a bulk of the population is concentrated in the BMC area. The supporting towns constitute nearly 27% (Table 5) of the population of Mumbai UA in 2001, which is likely to increase to 36% by 2013. BMC's problem could be ameliorated only when a suitable planning strategy for these supporting towns is also developed in tandem with the planning for the BMC. It is also important to note that the supporting towns are demographically growing much faster than the BMC. During this flood, the towns like Thane, Kalyan–Dombivili, and Panvel were badly affected and increased the miseries of the BMC by disrupting the road and railway transport originating from Mumbai.

The density map of Mumbai Municipal Corporation shows quite clearly how the population pressure has shifted over the last two decades (1981–2001) from the southern Mumbai toward western and central Mumbai, signifying the decay of the core (Fig. 2). Although, the document of 'Vision Mumbai' has been prepared keeping in view, the economic and quality of life goals to be achieved by 2013, it does not take into consideration, the likely size and distribution of population within

Table 5 Projected population of greater Mumbai UA, 2013

UA/constituents	Total population 2001 (000)	Percent	Projected population 2013 (000)	%
Greater Mumbai UA	16368	100	23443	100
Greater Mumbai (Municipal Corp.)	11914	73	15145	64
Rest*	4454	27	8298	36

(1) * Rest includes Thane (Municipal Corp.), Kalyan–Dombivili (Muncipal Corp), Ulhasnagar (Municpal Corp.), Mira–Bhayander (Municipal Council), and Navi–Mumbai (Municipal Corp.); (2)Kalyan-Dombivili (Municipal Corp.) includes Ambarnath and Badlapur which have separate Municipal Council in 2001, but were part of Kalyan (Municpal Corp.) in 1991; and (3) The figures are projected by the author based on 1991 and 2001 census information.

Abbreviation: UA: Urban Agglomeration

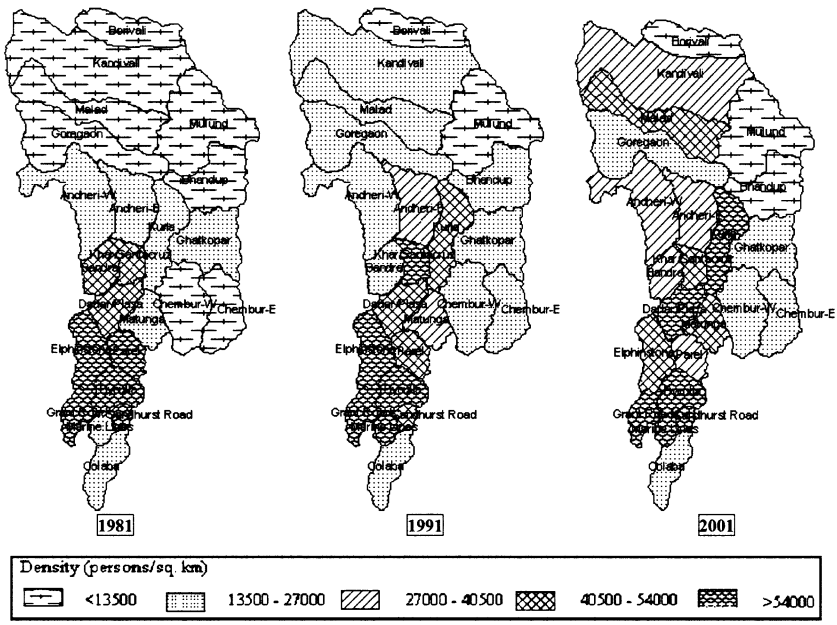

Fig. 2 Density of population in Greater Mumbai, 1981–2001

the BMC, let alone the Mumbai UA. Can any document ignore the demographic size, distribution, and growth of population in Mumbai city?

The recent flood has also shown that the areas badly affected were located in the suburbs, not in the CBD (South Mumbai). Kurla, Chembur, Sion, Bandra, Mahim, Kalina, Ghatkoper, Andheri, Saki Naka, and Santacruz are some of the localities, which were partly or fully submerged under water. The demographic pattern of growth shows that in the recent decade both the eastern and western suburbs have grown much faster than the CBD (Sita and Bhagat 2006). As such, the land-use and housing provisions in the suburbs needs to be much more planned and regulated in future.

Grass Root Concerns—Decentralized Planning at Ward Level

Any grass root level planning must begin with a situational analysis of environmental conditions and an assessment of quality of life at the ward level. In this respect, a study on the land-use changes in Mumbai city on the one hand, and the planning strategy to utilize the surplus lands arising from the closures of cotton textile mills on the other are extremely important. Also, an assessment of the needs and the associated problems of housing, water, health, sanitation, education, transportation, and clean environment at the ward level is very fundamental to the local planning and can be tackled by the civic administration with the active support of the citizens. On the other hand, the state government and its agencies should think and work for a planning strategy for larger geographical areas known as the Mumbai Urban Agglomeration in order to plug the sources of problems that lie outside the BMC limits. A regional approach to the management of environmental disaster is crucial for the development of Mumbai and its adjoining towns. The interactive planning

model of the new growth strategies can lay the foundation which starts with the premise that regional plans should reflect a consensus among equal partners and the local governments within a region (UN Habitat 1995).

Any vision of the development of Mumbai could be realized only when the city planning adopts a people centric approach to planning. This precisely means how participation of people in the decentralized governance and planning could be increased as mandated by the 74th Amendment to the Constitution. It must be admitted that there is no alternative to the participatory process of planning and consensus-based collaboration amongst various units of the governance (Phatak and Patel 2005). Thus, the functioning of the local governance and the development strategies that begin at the neighborhood remains critical in city planning which requires both the detection of the sources of misgovernance and the knowledge of the sources of corruption along with the means to fight them. It could be made possible by strengthening the citizen's forum at the neighborhood ward and city levels. The Constitution has only made the framework for political decentralization mandatory. This has to be further designed to cover administrative, fiscal, and economic decentralization (Litvack and Seddon 1999). Without such decentralization the full benefits would not accrue, particularly in emergencies like the recent deluge of 26/7.

Conclusion

An expanding city like Mumbai exploits its own land and water resources as well as the resources from its vicinity. Mumbai, being limited by sea, hills, and creeks, experiences very high population pressures on land. Unfortunately, the tremendous pressure on land in Mumbai has destroyed the landforms and natural drainages of the city. Further, the planning norms are not followed in the expansion and the development of the city. The destruction and misery brought by the torrential downpour on 26 July 2005 could have been minimized if the existing contours of the land were taken into consideration while implementing the developmental plans. Some of the short term as well as long term action plans as suggested by scholars are: desiltation and deepening of Mithi and Dahisar river followed by removal of materials away from the river; removal of structures along the banks of two important rivers to a distance of at least 20 m away; construction of high wall along the banks to prevent spilling out of flood water as well as to stop all encroachments; stopping the destruction of mangroves and completion of underground drainage system in the suburbs (Arunachalam 2005).

It is very important to note that the built-up areas in the city have increased manifold engulfing the open spaces, hills, mangroves, wetlands, and the natural drainages provided by Mithi and Dahisar rivers, and a disaster like 26th July may occur again. Although a rainfall of approximately 100 cm in just few hours as a result of cloudburst was unprecedented, the biggest question, however, is how to reach people at the moment of crisis like this and keep the transport network and means of communication functional in the city. No doubt that a disaster plan to mitigate such a situation will be very helpful, but at the same time the city administration and the Government can do their best to educate people on disaster related issues and prepare them to meet the situation. Any vision document on Mumbai needs to incorporate a planning strategy that meets the needs of majority of the people and

withstands disasters like 26/7. Planners, developers and most importantly, the governing authorities must not overlook the physical and natural aspects in the development and planning of Mumbai city. It is not impossible to be the proud citizens of Aamchi Mumbai, but it is also the time that Mumbai's planning and developmental discourse is unshackled from an illusion of Shanghai or Singapore.

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