LexQuest Foundation

Policy Brief

The City of Imbalance: The Burden of Population and Ecological Crisis in Mumbai

LexQuest Foundation

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About the Organisation:

LexQuest Foundation (LQF) is an independent, non-profit, research and action organisation, established in 2014, in New Delhi. We are striving to create, advocate and implement effective solutions for a diverse range of development issues.

To endorse participative governance, we engage with a broad spectrum of stakeholders, from various sections of the society, to ensure that policy-making remains a democratic process. We utilize pragmatic and futuristic research to disseminate actionable knowledge to decision-makers, experts and the general public.

Our key activities include capacity and skill-building workshops, policy advisory programs, public outreach, and stakeholder consultations. We collaborate with the government, other organizations and individuals for impactful policy formulation and execution.

By employing sustainable and equitable solutions through our multidisciplinary, intersectional initiatives and programs, we are constantly working towards creating empowered communities.

Expansion and City Growth: Mumbai Needs Space

Mumbai has a long history of migration which has been the prime factor behind the instrumental dynamics of population growth of the city. It is an established fact that development of industries coupled with urbanization has made the city a national & international business centre. Mumbai's booming economy meant that migrants came for job opportunities in the expanding industries, financial institutions, for business and administration. Mumbai's image as the film city also brought people from across the country seeking employment in the film industry.

De-industrialization of the city in the 1980s and 1990s closed down textile mills and relocated all types of industries to neighbouring areas making Mumbai more of a city driven by the service sector. The greater part of the service economy falls under informal activities, where the average income of a worker is hardly Rs. 6000 per month. With the passage of time, people from the city started shifting to nearby towns and villages, which led to the development of the satellite towns, further declining population growth in the mainland, plummeting to less than 0.5% in 2001-2011. However, this also meant expansion of new areas that are economically dependent on the city, but such expansion had limited scope in the case of Mumbai, with creek systems to the North and East and the Arabian Sea to the West. Mangrove swamps further complicate the picture, and these marginal lands often form the residence for the poorest people, who end up in unregulated slums.

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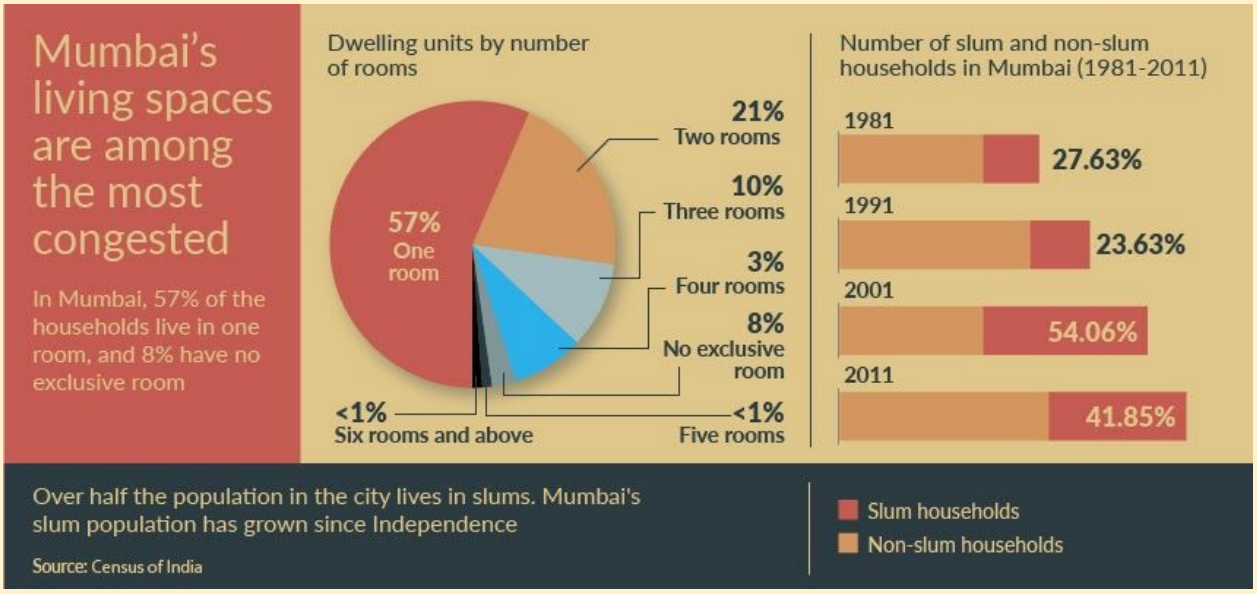
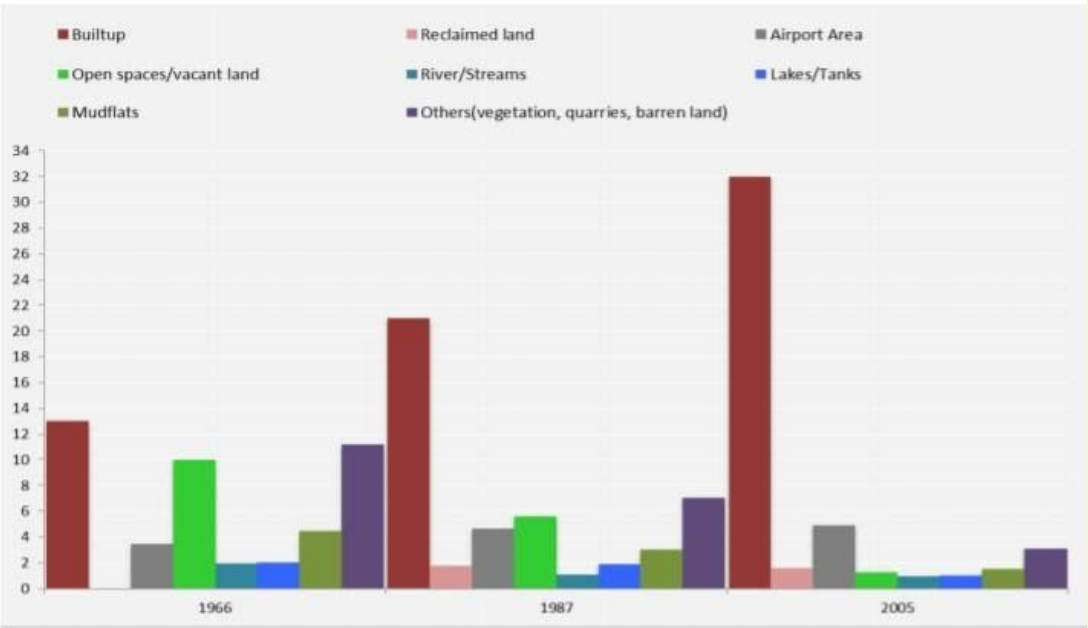


In a city of over 20 million people, space has become obsolete. For most people, daily life is played out in "chawls", which are multi level tenements with single rooms and shared bathrooms for each floor. The burgeoning middle class, lives in mass produced apartments of various shapes and sizes with space ranging from around 450 to 1500 square feet. **Because of the population, property prices are ridiculously high. Such exploding congestion has resulted in high rise apartments and small one bedroom studio apartments with areas as low as 180 square feet.**

A traffic congestion survey carried out in 2018 by TomTom Traffic Index puts Mumbai on number 1 spot at the international level. Such clogging congestion results in slow moving traffic which has repercussions at both micro and macro level. Moreover, **extensive road development causes chemical discharges in soil, water bodies and airsheds which lead to land, water and air degradation. City congestion is ultimately disrupting natural ecosystem services like water purification, pollution abatement, climate stability, crop pollination and flood and drought mitigation.**



Graph illustrating land use/ land cover changes in the Mithi River Catchment, Mumbai during 1966, 1987, 2005

According to the architect Parul Kumtha, the democratic 'space' that is responsible for human interaction and community well being is shrinking and causing constant ecological damage. These spaces are being exploited by real estate builders for their construction potential, all of which is happening at the expense of mangroves, wetlands, coastlines and public green and open spaces. A two decade long investigation led by a State Government appointed Committee on the Status of Mangroves for a 500 acres privately held land in Goregaon (West), found out no mangroves in the area between 2006-2017. However, environmentalists claimed that evident destruction of mangroves on the land was a result of an order of the Union Environment Ministry on April 5, 2013. Debi Goenka, Executive Trustee of the environmental group Conservation Action Trust stated that large scale destruction of mangroves was carried out by the proponent of a luxury project (consisting of a golf course, a clubhouse and villas) by building illegal embankments and blocking tidal water flow. **The Space Application Centre (SAC) stated that dense mangroves existed at the location from 1990 to 1998 but the destruction was overlooked; prior to a 2005 High Court order, mangroves were not included in the definition of 'protected forests'.**

The crunch in the city is only intensifying and citizens are immensely struggling to gain access to green and open spaces. **There is less than 0.03 acres of open**

space per 1000 people. The global norm is 4 acres. Open green spaces inevitably provide the amount of breathing space necessary for humans to enjoy social well being. But fast paced unplanned urbanisation is leaving little to no natural open spaces for the people. Keeping this in mind, new development projects propose the formation of promenades at coastlines of the city, with the intent to provide open spaces along the cityscape. But these concrete paved open spaces with minimum green cover cannot be a replacement for natural eco habitats and green spaces. In reality, people are only being robbed off their emotional and psychological well being.

Disrupted Water Bodies and Severe Water Crisis

According to the Composite Water Management Index (CWMI) report released by the Niti Aayog in 2018, 21 major cities (including Mumbai) are racing to reach zero groundwater levels by 2020, affecting access to clean drinking water. **Encroachment of natural water bodies and lakes has already been identified as a "major cause" of flash floods in Mumbai among other cities. Record number of tankers are the sole source of water in many parts of the city.**

In a study by the UN in 2003, almost all households in slums rely on municipal water supply for all purposes. Municipal Corporation of Greater Mumbai (MCGM) is responsible for providing water in these areas but unlike other civic resident quarters, single water tap connections in slums are given to multiple households to be shared as a common source of water. **The set criterion suggests that 5 households must share a single tap connection but in reality the number is much higher.**

As per the MCGM officials, such small housing conditions encourage community living where individual needs have to be overlooked over community needs. Surplus supply of water for gardening or use of washing machines is hardly a possibility in these areas.

The problem is also magnified by the fact that water is supplied only for a few hours and there are far too many people to use a single tap. Majority of the residing population does not have any water purification devices installed in their homes for the simple reason that they can't afford it and hence are compelled to rely solely on the pipeline water which isn't necessarily fit for drinking. Most water pipelines are either leaking or broken and there is a complete lack of sanitation facilities in and around these areas. Many surveys, year after year, establish the high prevalence rate of water-borne diseases like Cholera, Jaundice, Typhoid, Diarrhea, etc., in the slum areas of Mumbai, but the issue of sufficient and clean water for poor households in the city is far from resolved.

Rivers and streams have borne the brunt of the urban explosion of Mumbai over the last 40 years. **Unplanned growth led to the use of water bodies as dumping grounds for all kinds of waste which has fuelled the problem of water scarcity.** Since 2005 floods, multiple studies have decried the systematic destruction of the Mithi river, pointing to a host of environmental assaults. The airport's runway had been built over the river, narrowing the channel and forcing it into a 90-degree bend, and a new office district has been built on the wetlands. One

satellite study found that from 1966 to 2005, the width of the Mithi was reduced by almost 50%, while mudflats had shrunk by 70%.

The water crisis will have serious ecological consequences even outside the city as proposals for 3 new dams in the surrounding districts have already been initiated to supply water to Mumbai. It is a known fact that even small dams alter river flows and affect fish diversity in the rivers which has been proven by organisations like Bengaluru's Foundation for Ecological Research, Advocacy and Learning (FERAL).

Disposing Garbage and Managing Waste

Proper waste management and disposal is another big problem for the city of Mumbai. The MCGM is formally responsible for the management of waste in the city. The prevailing approach has been one of manual collection of garbage from communities by the municipal authorities and disposal at the two main dumping sites that are currently servicing the city. Nearly 95% of the waste generated in the city is disposed off in this manner. But the authorities provide formal systems of waste management only to slums which are recognised under the census of slums. Unfortunately, this is the city's own undoing since slums form 60% of Mumbai.

The dumping grounds at Kanjurmarg and Deonar are working at full capacity and require upgradation but congestion is forcing people to settle near these dumping grounds. A fire at Deonar dumping ground in 2016 created panic among citizens while also shooting up the air pollution levels in the area. This has led to the twin problems of people living in unhealthy conditions as well as protests for the closure of the dumping grounds.

Unavailability of open land scraps the idea of a new dumping site. Waste like paper, metal, etc., which falls under the category of 'incentivised waste' is sold to informal dealers by rag pickers. But the other inorganic waste such as old batteries, polystyrene, polythene bags, debris, to name a few, does not have any incentives attached, even if these are accumulated in huge quantities. Also, when the organic waste undergoes natural decomposition, it generates a fluid known as leachate, which, if not treated properly, penetrates the soil and pollutes the ground water.

Increasing in the construction activities is forcing the demolition of old structures, which in turn leads to the creation of more debris. There are truckers who earn a livelihood by collecting this debris and transporting it for disposal. But **disposing off debris into dumping sites garners high transportation costs, therefore it is dumped clandestinely in the creeks near Mithi river, thereby destroying valuable mangroves**.

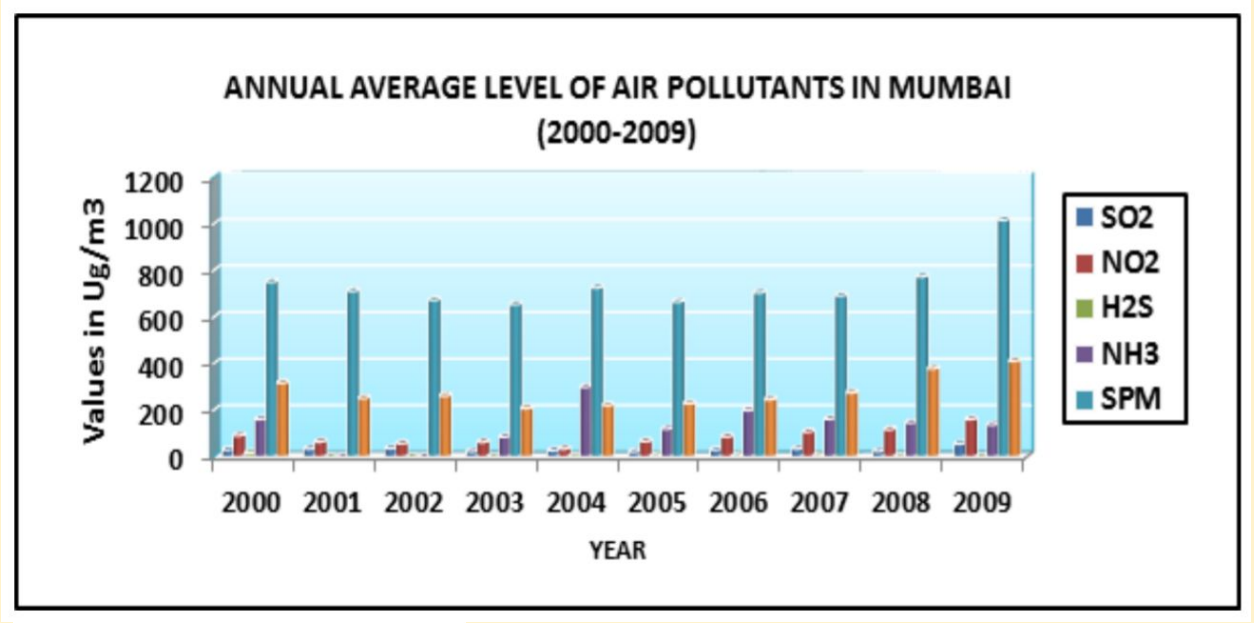
A report by the BBC explains how neighbourhoods like Mahul are adversely affecting people's health due to toxic pollution. A major part of transit camps like Mahul is meant for families who have been uprooted from illegal slum settings and provided temporary accommodation. These residential complexes or camps are essentially real estate projects of companies which are a nexus of the city's influential people and builders who benefit from building public housing. As a result, the builder regularly uses cheap, substandard and often potentially dangerous construction material and methods in order to cut the costs. Such housing complexes hence comprise dozens of

buildings which are not liveable, sewage pipes are broken, gutters are overflowing, electric wires are dangling everywhere; the air is stuffy, mosquitoes abound and rats scurry past the street as one walks around the neighbourhood. Piles of garbage have become a common sight in such neighbourhoods and people are suffering immensely. Residents in Mahul have recurring complaints about breathlessness, high blood pressure and bad eyesight due to pollution. Asthma, skin diseases and T.B. are prevalent health conditions in the area. The National Green Tribunal in 2015 declared that there is a perceptible threat to the health of the residents in Mahul because of the prevailing air quality in the area. Mahul happens to be one of the many neighbourhoods in Mumbai with problems of waste disposal and management.

Every year, tens of thousands migrate from rural India to Mumbai in search of livelihood and most of them are compelled to live in illegal shanty towns that add on to the overburdened and poorly managed infrastructure situation in Mumbai. This means that the city eventually ends up with more areas like Mahul which are a serious public health hazard.

Vehicular Congestion and Pollution

Around 7.5 million commuters cram themselves into local trains daily. Metro and monorail aid the transportation system of the city. Despite such integrated and varied transportation systems, the number of private vehicles keeps on increasing. The Centre for Science and Environment (CSE) analysed Mumbai's PM10 levels in a report which found that pollution in the city has risen by 64% in the last 10 years. Another report issued by WHO gives Mumbai the title of the fourth most polluted megacity in the world in terms of PM 2.5 concentrations.



Source: Neeri Zonal Laboratory (Mumbai)

With houses and studio apartments as low as 180 square feet coming up, the number of houses per unit area is bound to increase, which in turn increases the number of vehicles on the road. It is clear from the table that the levels of Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2); air pollutants from fuel combustion are constantly increasing and causing serious impact on human health in the city.

Furthermore, **a research conducted by the University of Sheffield discovered that plants exposed to increased levels of NO_2 produce stronger defensive chemicals in their leaves. Many insect pollinators, such as bees, flies, moths and butterflies when fed on these leaves, as per the report's results, grew poorly. These insects are an integral part of the ecosystem and ensure long term survival of wildflowers, shrubs and**

trees. The said research has shown cascading negative effects of air pollution on communities of these herbivorous creatures.

Need of the Hour: Policy Overhaul

Mumbai's urban population is fast growing and problems of water availability, waste management and congestion are going to get more complex in future. **Real estate development, Airport development project, Mumbai-Ahmedabad bullet train project, to name a few, are all meant to elevate the standard of life for an average citizen, however, their individual and collective consequences for the city's air quality, water reserves and potential for sustainable land use draw a dismal picture.**

Policies that were first implemented for land reclamation of seven small islands by the Britishers, are now being applied to the whole city, but the population difference between then and now is massive. **As more people keep adding on to Mumbai's population, need for extending basic services for the population surges.** Development in the name of affordable housing societies and efficient transportation systems are some of the direct and major implications for the ecological cycle of this city on the coast of the Western Ghats. Pollution is increasing, groundwater is depleting, land is scarce and citizens are now troubled with the imminent danger of floods which have been frequenting the city since the past two decades.

Recommendations:

Efficient Waste Disposal and Treatment

- ➔ Already existing recycling practices in Dharavi's slum are a potential measure towards adopting a sustainable lifestyle, and tackling problems of waste management and land degradation. These one room factories, which are almost 15,000 in number, employing around 250,000 people have connections all over Mumbai to supply waste and recycle 80% of the city's waste. As of now these centres run through informal mechanism. Therefore providing legal and financial assistance to such recycling centres in Mumbai would help increase their recycling capacity and would raise employment and income levels of the people.
- ➔ A large amount of the waste reaching the dumpsite is organic in nature which can be used as biofuel after undergoing required treatment. Moreover, both large and small housing societies should set-up organic waste converters, vermicomposting or bio-methanation facilities in their neighbourhood to reduce dumping untreated waste.
- ➔ Proper waste management in construction activities is still overlooked which causes serious ecological consequences for mangroves in the city. Definite laws and strict policies for treatment and disposal of waste for developers and owners could help reduce damage caused by construction debris.

Infrastructural Well Being

- ➔ Almost all public projects, including public housing must be alloted via architectural design competitions which are a part of the provisions of The Architects Act, 1972. This will ensure quality construction and liveable spaces for the users. Currently, maximum projects are awarded by government officials to personal acquaintances in real estate companies or via the criteria of annual turnover of the companies which is often a difficult criteria to meet even for the best and boutique architecture practices in the country.
- ➔ Revival of fishing communities in Mumbai city could be a possible solution to enhance the ecosystem of the city much like Thailand's decision to open one-stop fishery centres. By providing licenses, medical check-ups, work-contract examinations and retinal scanning, the fishing communities in the city could be provided with the necessary boost.
- ➔ Carrying out mobility behaviour census, i.e., understanding of the transportation habits of the city via door to door survey, much like a population census can bring out possible statistics to better understand urban

mobility of the city which could be viable to form measures to strengthen public transport and curb air pollution.

- ➔ Encroachment of roads for various non-transportation uses slows down motorized vehicles, which results in increased fuel consumption, consecutively causing more air pollution. Strict laws restricting the use of roads and policies to efficiently find alternatives for multi-purpose public goods prohibiting parking, street-sellers and stray animals could help reduce air pollution.

Endorsing a Green Future

- ➔ Mumbai could also adopt Malaysian government's incentive program in the form of investment tax allowance for the purchase of green technology assets, which is suitable for both companies and individuals under different technology brackets and income tax exemption for the use of green technology services and systems.
- ➔ The government should look towards encouraging 'green travel', which includes boosting public transport, bus/metro services, local trains, etc. Introduction of on call public transport like shuttle bus services will encourage people towards using more public transport and instill a culture of carpooling.
- ➔ If need be, Mumbai can adopt China's 'one car one license number' policy to reduce the number of vehicles on the road. The said policy has been successfully implemented in a number of cities in China and has resulted in a gradually decreasing number of cars and increasing proportion of public transport users.
- ➔ As is evident from China's example, as per the observations by the World Bank statistics, improvement in education and income levels can reduce family sizes more than any laws or policies. Government should invest extensively and intelligently in the employment and education sector keeping in mind the population of slums, which accounts for 60% of the city's population.

The Singapore Model

- ➔ Singapore, the country which is internationally recognised as a leader in innovative water management despite having limited space for water storage, has much to teach other countries. Mumbai can certainly borrow some of the policy measures adopted by the country:
  - ◆ Maintain cross-sector coordination to reduce wastage of water.
  - ◆ Use desalination plants as a source of water supply.

- Protect local catchment areas near rivers and water bodies and restrict any kind of construction and/or stricter permitted clearance for construction activities in these areas.
- Brand the recycled waste water (NEWater) which is suitable for all activities ranging from drinking to industrial use. It meets nearly 30% of the country's demand.
- Impose a more efficient tariff structure as compared to conventional subsidised water to all households. It includes a standardised pricing structure for all households regardless of their income, combined with a targeted subsidy to low income households.

Any city can provide comfortable living conditions for only a limited population. When that limit is breached, corporations and governments have to look for sustainable policies, which yet again depends on people adopting sustainable lifestyles. Rainwater harvesting, carpooling to work, using public transport, being mindful of their resource consumption and household's carbon footprint are some of the seemingly small steps people can take to deal with the multi pronged challenges of urbanisation in the context of Mumbai's ecological well being.

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