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# Environmental Problems of Mumbai

Mumbai- the name conjures up images of high skyscrapers, wide roads, the sea-kissed Marine Drive, a land of opportunity and enterprise.

A city full of paradoxes, Mumbai is a microcosm of India in many ways. If one were to ask a set of people to describe the present Mumbai, we would get a wide variety of answers ranging from the financial capital of India to the next target of militant groups. For me, I see a city at a crossroad, deciding which direction to take. One minor part of her is decisively pulling her towards the path marked 'Destruction through development' while a major part of her wants to take the path of 'Sustainable Development' but cannot do so since it is chained to bureaucracy and politics.

## The Issue

Pollution, population and lack of space have always been traditionally described as the ultimate problems of Mumbai while relegating the acute problem of environmental degradation into oblivion. However, this slowly-ticking time bomb burst into the face of Mumbai in the form of the deluge on July 26, 2005. Unlike what half the city would like to believe, 26/7 is not a sudden indicator of the environmental mess the city has got itself into. Leopard attacks in a bustling city, landslides, abnormally high temperatures in summers, erratic rainfall have long since warned the city of the impending doom. But we have chosen to ignore it all because it is more convenient to do so.

In the aftermath of 26/7, several committees have sprung up enquiring into the exact causes of the deluge. They have come up with alarming results and equally alarming future prospects for certain sections of Mumbai namely the construction industry. If we do not act upon these recommendations, our city will certainly soon be history. This project has been an eye-opener for me more than anybody else.

The environmental problems of Mumbai have emerged due to the creation of the city itself. The city originally comprised of seven major islands and other smaller masses of land. On its acquisition by the British in 1665, the seven islands were fused together to form the city of Mumbai. The British recognized its potential as a port and developed the city through extensive land reclamation. Thus, several small rivers and their tributaries that ran through the length of Mumbai were filled in. This depleted the areas of dissipation for the water, which is very important factor for an island city like Mumbai. Modern experts and politicians would like to blame the British for destroying the natural environment of Mumbai; however, sanction of hazardous policies and projects like the Bandra-Worli sea-link in the past two or three decades have done more harm to Mumbai than the 150 years of British regime. The problem is that the authorities have failed to foresee the consequences of tampering with the environment. They have consistently ignored the warnings and pleas of environmentalists. Infrastructure projects are sanctioned in the name of development of the city, hardly emphasizing on the environmental impact assessment. The government in turn is issuing environmental clearances to projects like the construction of 20-storeyed skyscrapers on the fragile Cumballa hill.

The genesis of the environmental problems of Mumbai is in the fact that Mumbaikars refuse to believe it is a problem.

A few of the many pressing environmental issues being faced by Mumbai have been highlighted in the following pages.

### THE MANGROVES

Mangroves are an integral part of the landscape of Mumbai. However, they are fast disappearing owing to rampant construction and lack of governmental will for their protection. Mangroves are small sturdy woody plants which are found in low-lying shallow areas. Mangrove ecosystems serve as a buffer between land and sea. They actually protect the land from the impact of the sea and by trapping silt they also maintain the integrity of Mumbai's shoreline. For a major economic port like Mumbai, this is very crucial to maintain stability along the coastline and avoid accidents. However, the city has not yet learnt to appreciate this service done by mangroves.

Mumbai is surrounded by over 5000 acres of mangrove swamps spread over various areas like Mahim, Madh, Thane creek, Versova, Gorai and Ghodbunder. Of these, Mumbai has lost almost 40% to reclamation of land for construction and developmental projects. About 300 acres was sanctioned to build the Esselworld amusement park in the Gorai creek at Borivli and a golf course at Andheri.

However, the biggest symbol of the destruction of mangroves is the Bandra-Kurla complex which was built on reclaimed land almost strangulating the mouth of the Mithi River. Creation of infrastructure is an important and totally justifiable end in a city like Mumbai which is aiming to gain an international look. However, unplanned urban development without respecting the course of nature will always backfire in the form of a disaster like 26/7. In a coastal city, wetlands, wastelands, saltpan lands and mangroves function as buffer zones against tidal movement. Each of these have been systematically destroyed which has resulted in deterioration of land.

In case of mangroves, land has been reclaimed in the name of slum rehabilitation and garbage dumps. Sadly enough, on these pretexts, valuable mangroves are destroyed to make way for high rises. Another fact which is not understood is that marshy land is not meant for extensive construction and concretization of such land reduces its water absorption capacity. This makes natural regeneration of underground aquifers almost impossible. Secondly, construction debris and garbage is also dumped in mangrove swamps in a bid to reclaim land.

Mangroves have been classified as a Coastal Regulation Zone-I (CRZ), which means that construction cannot take place without the express permission of the CRZ Authority. This makes all construction activity in mangrove areas a violation of CRZ rules. The Bandra-Worli sea-link and the Sewri-Nhava-Sheva sea link are examples of large-scale projects that shall considerably affect mangroves in those areas.

The Bandra-Worli sea-link (BWSL) and the Sewri-Nhava-Sheva sea link have been mooted to provide an alternative to the transport problem in the city and for smoother movement of traffic. However, both these projects are in serious violation of several environmental laws namely the Coastal Regulation Zone (CRZ) rules and are single-handedly responsible for destruction of swathes of mangroves.

In the case of the BWSL, there has been blatant violation of the terms and the conditions of the Environmental Clearance dated 7th January 1999. Secondly, the State of Maharashtra and the MMRDA (Mumbai Metropolitan Regional Development Authority) gave an undertaking that no reclamation would be carried out in the Bandra- Kurla Complex

area and no mangrove in the Mithi River and its estuary would be destroyed. In spite of that, around 27 hectares of land has been reclaimed by 2001, much beyond the 4.7 hectares permitted by the Environmental Clearance of 1999. This reclamation has proved very cost-effective to the builders. It has also been given legal clearance by modifying the conditions of the Clearance.

However, implementation of this sea-link would mean the virtual blockage of the Mithi River and a further narrowing of the mouth of the Mahim bay. Of the 1600 meters width of its mouth, 670 meters shall be closed. Also, the mangroves situated in the creek play an important role of flushing the water before it reaches the sea. The narrowing of the mouth of the creek causes the effluents to get trapped near the mouth which is slowly destroying this ecosystem. The Maharashtra State Road Development Corporation (MSRDC) which is responsible for the sea-link staunchly denies that reclamation and sewage disposal programmes initiated by them have affected the Mahim creek. An estimate of the damage caused to the Mithi River can be gauged from the fact that in spite of the desiltation and cleanup undertaken in the aftermath of 26/7 failed to prevent flooding in these areas.

The 4000-crore 22.5 km long Sewri- Nhava Sheva trans-harbour link represents a similar environmental danger. The project aims at building a link between Mumbai (Sewri) and the hinterland (Nhava Sheva). The Phase I of the project will comprise a 6 lane dual carriageway linking Nhava and Sewri and Phase 2 which is expected to be added in the year 2015 to 18 will consist of a double track rail link which will run parallel to the road link on the north side. This bridge would run through the Sewri mudflats. The crescent-shaped stretch of mangroves and mudflats between Sewri and Trombay is the winter feeding ground for two of the world's five species of flamingos and other birds. To save this habitat, the Bombay Natural History Society (BNHS) had suggested the bridge be moved 500 to 700 metres to the South. The Mumbai Port Trust did not have any objection to this proposal, however the MSRDC shot down the suggestion. The Ministry of Environment and Forests (MoEF) has said that there must be a silent zone of 2 km radius at the same site.

### THE COAST

In 1991, the Coastal Regulation Zones were formed in Mumbai following a Supreme Court order that all coastal states must devise guidelines for all construction activity in such areas. However, the state government was not very sincere in implementing CRZ rules. This is evident from the fact that it failed to immediately designate mangroves as CRZ-I in its Coastal Zone Management Plan (CZMP) devised in

1995. Builders and developers were allowed to exploit loopholes in the CRZ notification rendering it ineffectual. Mangroves were given CRZ-I status much later following protests by environmentalists. Thus, the purpose of CRZ to restore and preserve the shorelines and marine life remained unfulfilled.

Even after the Coastal Task Force pointed out irregularities in the Maharashtra Government's CZMP, the state government rejected its suggestions and submitted a new plan that clearly violated the regulations laid down by the Ministry of Environment and Forests (MoEF). The plan failed to designate huge tracts of mangroves in Mumbai and New Mumbai, limiting them to only 100 hectares, in an attempt to regularise ongoing, illegal construction in the Bandra-Kurla commercial complex, co-operative housing complexes in Versova and a road in New Mumbai, all of which, claim environmentalists, lie in CRZ-I designated areas. It also wrongly classified no-development areas with a view to developing them in future - an obvious attempt to please the builder's lobby,

In a clearly populist move, the CZMP allowed the reconstruction of illegal buildings and slums in the coastal zone to facilitate the Slum Redevelopment (SRD) scheme. The plan also sought to reduce the CRZ limit on the banks of rivers, creeks and backwaters from 100 metres to 50 metres in all municipal corporation areas, and designated no-development areas around fishing villages and beaches - like Madh, Marve, Manori and Gorai as CRZ-II, so as to allow construction in the area.

It allowed expansion of industries and dumping of wastes from thermal power stations in the CRZ, as well as reclamation of land (all banned in the 1991 notification) for roads, railway lines and stations. Furthermore, it proposed that the investment limit, for development activities in the CRZ which required clearance from the MoEF, be raised from Rs 5 crores to Rs 100 crores.

The state has obviously not understood or refuses to accept the logic for such rules. Environmentalists explain the rationale behind such rules is that it protects the livelihood of over 10 million people and ensures the health of several millions more. The utter disregard of the state machinery to CRZ norms is evident from the fact that the rules have been amended 10 times since their introduction in 1991. The most recent amendment proposal came in 2002 which proposed to allow non-polluting and service industries like golf courses, hotels and IT hubs to be located in the CRZs. This was mooted to facilitate the development of the Navi Mumbai SEZ. Also, the proposal aimed to permit the building of infrastructure and dwellings for 'local inhabitants' in CRZs. The term 'local inhabitants' is quite a loose concept and can

be misused especially since the proposal wishes to delete the term 'the traditional rights

A survey conducted under the auspices of the Indian National Trust for Art and Cultural Heritage (INTACH) and a number of other associations revealed that only one-third of the 34 kilometre waterfront from Colaba to Versova, is available for public use. The survey points out the distinct nexus between private developers and the state, which perpetuates the manipulation of land. It also brings to notice the vast stretches of open space on beaches, lost to land mafias operating in collusion with local agents and municipal officials. The survey also highlights the continuing violations of the CRZ by five-star hotels, resorts and houses along the major waterfronts like Bandra Bandstand, where vested interests are destroying the natural contours of the area by leveling the hill.

In addition to government will in implementing the CRZ rules seriously, there has to be better co-ordination between affected persons, the state, environmentalists and lawyers in order to give a tough fight to those who violate these norms.

As mentioned earlier, one rule which the authorities pay absolutely no heed to is the CRZ regulations. The following is just one example of the many ways in which the rule has been circumvented. One CRZ rule is such that if there is a road running near the coast, development is permitted on the non-coastal side of the road. So development plans show roads, which are proposed but actually never constructed. The new development plans started in 1992, around the time when the judgment regarding CRZ rules was given. The first development plan showed a ring road almost touching the sea and encircling the city. This does not exist in reality but it was inserted into the plan so that wherever they wanted to get exemptions for construction they would actually build a road, say that it was in the original plan and then proceed to carry out the so-called permitted development near the road and violate the CRZ. Slum redevelopment is possible in the CRZ areas within the present rules. If the CRZ rules are relaxed or waived completely, builders will benefit tremendously. For an island city like Mumbai, implementation of CRZ rules is compulsory. However, in the present scenario both the city and the slum-dwellers, in whose name most of the construction is done, are the losers.

### THE GREEN COVER

In recent years, several extensive infrastructure projects have been sanctioned for the 'good' of the city. These include various road-widening projects, construction of new flyovers and link roads. Organizations like the Mumbai Urban Infrastructure Project (MUIP) and Mumbai Urban Transport Project

(MUTP) insist that these projects can be carried out only with the felling of trees in those particular areas. They refuse to consider seriously alternate plans submitted by the citizens.

A legal authority that can enforce such organizations to take cognizance of these plans sadly chooses to remain passive. The Tree Authority enjoys a huge annual budget and can demand developers to conform to the requirements of protection of trees during any projects. However, a large part of this budget remains unspent. In 2004, for example, the budget was over Rs 14 crore. Of this, Rs 10 crore-more than 70%-went unspent. Secondly, the Tree Authority has a poor grasp of the amount of trees being cut in the city. Take the example of the MMRDA's road development projects, for which in the last 12 months, the Tree Authority issued a total of 3,503 permissions to cut trees. Despite this, on just one project-the Eastern Express Highway-over 12,000 trees were cut down.

Similarly, transplantation that was supposed to have been carried out by developers has never been monitored to ensure that the trees in question survived shifting. As far as illegal hacking of trees is concerned, the Tree Authority may get as far as filing a police complaint when a member of the public makes a written complaint, but no action is taken against those who carry out repeated illegal hacking of trees. Also, the police often discourage people who try to make a complaint about illegal tree cutting. The Tree Authority should spend some of its money on educating its own officers as well as the police force regarding the gravity of the situation.

Secondly, the census of trees needs to be carried out once in five years. Even for this, the Authority needs to be pushed to begin the census. The last census was carried out in 1998 when it recorded that there were 5,00,024 trees in Mumbai (excluding those in the National Park at Borivli). Accordingly, the next census should have been carried out in 2003 but the Authority has always shown disinterest in this regard. In fact, given the current rate of development, a census should be carried out once in every 2 years. However, a Tree Authority source says the authority plans to propose an amendment to the Maharashtra Preservation of Trees Act (1975), so that the census need be carried out only once every 10 years. Such convenient measure shall provide impetus to developers who will believe that they can get away with anything.

The public needs to be convinced that the authorities shall back them up so that they will be more vigilant about illegal felling of trees

### THE LUNGS

Mumbai is the only metropolitan city in the world which boasts of a national park in the middle of one

of its busiest suburbs. However, the existence of this green space is being threatened by illegal construction activity, encroachment by slums and quarrying. Several companies carry out quarrying in the park which have led to the erosion of the land and have also affected the habitats of the animals. Quarrying also reduces the mineral content in soil which affects its water retention capacity and alters the course of natural water sources. The park is being hemmed in by all sides by unchecked development. With the entry of man into nature, nature has entered man's backyard in the form of leopards attacking people and homes. The National Park is a veritable treasure of various species of birds and animals. Besides, it is the green lung of the city whose strangulation would mean the end of the city. 85% of Mumbai's water supply comes from the Tansa and Vihar lakes which are located in the environs of the park. Destruction of the park would affect the water supply adversely.

The same can be said for the Aarey Milk Colony of Goregaon. This stretch of 4000 acres has been famous for its dairy farms and picnic spots; but its role in reducing the pollution levels of the city have hardly ever been acknowledged. This stretch of trees absorbs a large part of the vehicular pollution of the city. In spite of this, a proposal has been mooted to cut down these trees as a part of the construction of the Jogeshwari-Vikhroli link road. This shabby treatment of these two last surviving green spaces makes it evident that the city has yet to realize their importance in its scheme of things. Secondly, encroachment of slums is not being checked by authorities in both the places. Extra forces required to enforce such norms are not being deployed which is allowing valuable green space to go under illegal structures.

### THE LAND

According to international standards, the minimum amount of open space required per thousand persons is 4 acres; for Mumbai, it is merely 0.03 acres per 1000 people. An ideal way of correcting this anomaly is to prudently use the land available to us. 600 acres of mill land in Central Mumbai is the last chance for us to provide the city with any breathing space. However, of the 58 defunct mills, the National Textile Corporation has sold off 5 mills for Rs.2000 crore to various developers.

In 1991, mill-land owners were allowed to sell or develop their land giving two-thirds land to the city; one-third each for government housing and green space. This would mean that the city would possess 200 acres of breathing space. However, this reduced the lucrative prospects of this land and checked the proliferation of shopping malls and high-rise complexes. Owing to vested interests of the then Government itself, in 2001, the Development Control Regulation Rule (DCR) 58 (1) (b) was modified to

benefit the owners. They had to now give up two-thirds of only the 'open land' to the city. Furthermore, according to a clarification issued by the government in March 2003, this did not cover land under demolition of existing structures which in effect increased substantially the owners' share of land.

Such rulings have been passed only in favour of short-term benefits and have not tried to foresee future disasters. Rampant construction and 'development' cannot take place if the city cannot sustain it. Construction has to be accompanied with a proportionate increase in the supply of civic amenities like water, electricity, drainage, roads and parking facilities. There is already tremendous pressure on these amenities and further construction without augmenting their supply would lead to congestion and pollution. As mentioned earlier, often land is dereserved or taken over for construction for the purpose of slum dwellers' rehabilitation. However, the developers turn out to be the ultimate winners. The mill land can at least provide us with an opportunity to provide low-cost housing while maintaining some open space.

However, since the state itself stands to win in case the modified rules are applied, there is a total lack of government will in understanding that the city needs sustainable development than Shanghaisation.

### BUILDER-BUREAUCRAT-POLITICIAN NEXUS

Till now, we have examined several aspects of the environmental problems faced by Mumbai. However, the common thread that runs through all these various problems is the lack of government will and apathy in enforcing eco-friendly rules for short-term windfalls. Each of the above problems is the collective result of the nexus between builders, bureaucrats and politicians who have time and again exploited the city's land and its people for selfish gains. This exploitation takes place in numerous forms, some of which have been mentioned below.

All infrastructure projects with an environmental clearance are used to create more land so that this extra land can be allotted to builders and more money can be made. Through reclamation, land is created from wasteland near the sea. Then it is given the status of a no-development zone. However, since this 'no-development zone' is contiguous to development areas, small construction is allowed. Initially, smaller Floor Space Index (FSI) is offered ultimately ending in unlimited FSI through government legislation which paves the way for unlimited construction. Thus, more and more land is created from the sea, destroying all buffer zones of the city and leaving no room for the movement of seawater.

In a similar move, in order to have an opportunity to

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develop more land, urbanization of the Vasai-Virar and Bhayander belts was allowed. These important buffers which absorbed the impact of the sea were destroyed. Creation of infrastructure and housing is an important demand; however it has to account for the environment. A clear disregard for Mumbai's open spaces by politicians is evident from the fact that Manohar Joshi and Raj Thackeray jointly bought Kohinoor Mills no. 3 of 4.9 acres for Rs.4, 21, 00, 00, 000. Benefits derived from such deals overrides their public duty towards the city.

Another form of governmental exploitation of open spaces is the dereservation of plots earmarked for gardens and playgrounds within the city limits. . As Chief Minister, Sharad Pawar de-reserved 285 plots; Manohar Joshi 300 plots; and Narayan Rane, in his eight-month rule, de-reserved about 180 plots, one of which covered 660 acres (264 ha) in Mankhurd; Vilasrao Deshmukh continued the trend. Sushilkumar

## What our Brightest Youngsters think!

Shinde de-reserved 67 plots. All these put together would perhaps amount to almost 50 per cent of the space for amenities. On paper, the development plan's amenity spaces ratio is 0.2 acres per 1,000 people. Of this, 82 per cent is taken over by slums so that the actual ratio is 0.03 acres per 1,000 people. This is the lowest in the world. By Indian standards it should be 4 acres per 1,000 people. If you take international standards it is 12 to 14 acres per 1,000 people. The other metropolitan cities, Delhi, Chennai and Kolkata, have a ratio of about 4 acres each. The logic behind this idea is scary. When a plot is reserved, it has no commercial value since nothing can be built on it. Its price is zero. But when it is de-reserved, the price shoots up to the level of land price prevailing in the area. It is a major source of income for politicians. When more FSI is given on that plot its worth increases further. So with an investment of a lakh of rupees you can make Rs.20-50 crores.

## SOME SIGNS OF SANITY?

Solutions to environmental problems are tricky issues. There is no water-tight solution which can be implemented that can solve these problems easily. I would, in fact, in this section like to point out a few heartening indicators for Mumbai's environment whose recognition in itself is a solution to Mumbai's problems.

## MANGROVE PARKS

The western bank of the Thane Creek is the single largest mangrove belt in Mumbai. A substantial tract of this mangrove land is adjoining the Godrej & Boyce Township. Since 1985, The Soonabai Pirojsha Godrej Foundation has been maintaining these large tracts of quality mangroves in the city. This swathe of mangroves stretches across 1750 acres and is home to several species of birds, fish and even corals in some places. The marine life at this part of the coastline has been regenerated thanks to the Godrej Mangrove Park. In the aftermath of 26/7, Vikhroli witnessed minimal flooding owing to these mangroves. The Pirojsha Foundation also aims at spreading knowledge about the importance of mangroves especially among children. Its activities include-

- Nature trails in mangroves for all age groups
- Audio-visual shows on mangroves
- Poster exhibition on mangroves
- Mangrove Interpretation centre
- Tree planting drives
- Continuous monitoring of Vikhroli Mangroves
- Plantation programmes in areas other than in Pirojshanagar

The Sewri Mangrove Park was declared a protected area on January 15, 1996 by the Bombay Port Trust (BPT). This park consists of 15 acres of mangroves between the mudflats of Sewri and Trombay. Like the Godrej Mangrove Park, it preserves the stretches of mangroves.

## ENVIRONMENTAL ACTIVISM

Mumbai has always had its share of dedicated environmentalists and NGOs which have fought tirelessly to secure a future for the city by heading it off environmental suicide. The Bombay Natural History Society (BNHS) has been supporting the green movement in order to protect the distinct wildlife found in Mumbai. The Bombay Environmental Action Group (BEAG) has also been extremely active by opting for legal redressal of Mumbai's problems. Recently, they have succeeded in achieving two landmark rulings regarding mangroves and mill lands.

Debi Goenka of BEAG has consistently highlighted the bleak situation of Mumbai's environment. Bittu Sehgal, renowned environmentalist and the editor of Sanctuary magazine has played an important role in exposing the attack made on Mumbai's natural environment by various forces. Dr. Anahita Pundole also drew attention to the illegal hacking of trees for better visibility of hoardings through her PIL in the Bombay High Court in 2002.

Besides these activists, several local residents' associations have been formed which maintain a vigil in their areas for illegal hacking or encroachment. In several places, barren lands have been converted into public gardens.

Some organizations are trying to fight government-sponsored eco-un-friendly projects. Like the Maharashtra Machhimar Kruti Samiti are trying to oppose the Bandra-Worli sea-link'due to its adverse effect on the livelihood of fishermen in that area.

## HC ON MANGROVES

In a judgment delivered on October 6, 2005, the Bench of Chief Justice Dalveer Bhandari, and Justice Dr. D.Y. Chandrachud left no one in doubt when it said: "There shall be a total freeze on the destruction and cutting of mangroves in the entire State of Maharashtra." The order banned the dumping of debris in mangrove areas (a common underhand way to reclaim land) and forbade "any authority" from granting permission for development activity in them. The Bench said no applications for development should be entertained "regardless of the nature of ownership" of the land. It also banned construction within 50 metres of mangroves. The two Judges asked the Coastal Zone Management Authority (CZMA) to file monthly reports to the court. They also authorised the Principal Secretaries of the Forest, Revenue and Environment Departments to ensure compliance of the order.

The judgment was in response to a Public Interest Litigation petition filed last year by the Bombay Environmental Action Group (BEAG) "seeking urgent measures for the protection and preservation for the fast depleting mangrove forests" along the Maharashtra coast. In keeping with the spirit of people's action, the court directed the State government to assign the District Magistrate and the Deputy Commissioner of Police to act on complaints from the public.

As the first step towards saving this much-abused coastal vegetation, the court has asked for a study of mangroves using high-resolution satellite maps. Some maps made in 2005 by the Maharashtra Remote Sensing Application Centre were presented during the hearings. The court has asked for a more detailed

mapping of the Mumbai and Navi Mumbai areas and it expects the information to be transferred on to a cadastral or city survey map by April 2006.

The order also said that by next June the government would have to notify the mangroves it owned as "protected forests" and the privately owned ones as "forests". The final stage of handing over the government lands to the Forest Department would have to be completed by August 2006.

The Forest Department has been given the task of clearing debris from mangrove land and prosecuting those abusing such land. It will also have the responsibility of replanting mangroves in areas where the growth is less than 40 per cent.

Debi Goenka of the BEAG sees many advantages in the Forest Department being given the responsibility of managing mangroves. For one, it has its own guards, he says. He also says that once mangroves are notified as forestland, changing the land-use pattern will be difficult because of the strict guidelines set down by the Supreme Court.

While the terms of the High Court order are straightforward, they will not be easy to implement. Everything hinges on proving which is mangrove land and which is not. Satellite mapping is the only foolproof way of establishing the mangrove areas. At present there are satellite maps of the Maharashtra coastline for the years from 1989 to 1991 and for 1996, 2000 and 2005. The authorities and builders would be hoping that post-1998 maps are followed because that would imply the acceptance of the 1998 Coastal Zone Management Plan. Prior to 1998 there had been a construction boom, and implementing the "earlier plans" would have proved uncomfortable for builders. In fact, the Satellite Survey 2005 pointed out that there was 600 sq.km. of wetland in the State of Maharashtra mainly concentrated in Mumbai, Thane and Konkan. Of this, 257.11 sq.km. are mangroves of which 40 sq.km. are located in Mumbai.

Recent updates reveal that there is a 30% depletion of mangroves. In keeping with the court order, the Forestry Department issued a notification declaring mangroves on government land as 'protected forests' and those on private land as 'forests'. It has already missed the August 20, 2006 deadline set by the Court. This depletion of mangroves explains the dwindling catch in the Thane creek.

There is perhaps a double advantage in placing all the satellite maps before the court. It will help define clearly the mangrove areas and, through a comparison of the maps, also reveal the time period in which the mangroves were destroyed. For instance, between 1997 and 1998 about 3,400 square metres of mangrove in Malad, a north Mumbai suburb, was

reduced to 1,400 square metres. A gigantic mall came up on the 2,000 square metres that had been filled in rapidly by dumping debris.

THE court's order is sure to have far-reaching effects and has meant different things to different people. For the 1, 50, 000 residents of the Guzdar Scheme and Saraswat Colony, the monsoon season has been a nightmare for the last five years. The heavy rain and high tide invariably leave the areas under one metre of water. Worse, the nearby creek overflows into the apartment blocks, taking with it filth from the sewage system. This happens 12 to 15 times in a season. As a result, real estate prices on the Guzdar bund road fell to about Rs.5,000 a square foot from around Rs.10,000. Residents of the colony blame it on the destruction of the 25-acre (10-ha) mangrove forest to make space for illegal constructions.

Gautam Rao, chairman of the Guzdar Scheme Residents Trust, says the construction began in the late 1980s. By 2001, a government survey showed that there were 8,315 structures. All 25 acres of the mangrove had been wiped out. With the mangroves gone, the capacity of the land to absorb water has been greatly reduced. The mangroves and the sluice gates in the creek ensured minimum flooding or none at all during high tide or heavy rain. Now, discharging the excess water is at crucial issue. Rao says vote-bank politics ensured that Guzdar Scheme residents bore the brunt of the floods. "The municipality removed the sluice gates. There is no way we can prevent the flood waters from entering the colony."

A stringent implementation of this rule shall prove to be boon to Mumbai's mangroves and to its citizens which have to face flooding every monsoon owing to their destruction.

### HC ON MILL LANDS ISSUE

The Bombay High Court, in response to a public interest litigation filed by the BEAG, ordered that two-thirds of the mill lands being opened up for redevelopment must be reserved for open spaces and public housing. This October 17 ruling struck down on the 2001 amendment made to DCR 58 (1) (b) and its subsequent clarification in March 2003. It upheld the original 1991 sharing formula which had been devised when the mill lands were first opened for sale.

This ruling meant a huge victory to the green movement in Mumbai. The legal backing provided by the HC was a major boost. However, the mill owners moved the Supreme Court against this order and in March 2006 the Court upheld the sale and development of the NTC mills. However, a small ray of hope still exists as the builders are required to give up some land for the city.



**ALTERNATIVES TO PROJECTS LIKE BWSL**

The several environmental repercussions of large projects like BWSL have been stated on various occasions above. However, some viable solutions have to be found for the traffic congestion problem in Mumbai. The Mumbai Urban Transport Programme (MUTP) that is funded by the World Bank has certain projects under its authority. In 1994, the World Bank assigned W.S. Atkins the task to evaluate the various projects included in the MUTP-II framework and to formulate a Comprehensive Transport Plan for the Mumbai Metropolitan Region. The Atkins Report states that 'Economic analysis shows that the aggregate economic return is highest for a strategy with substantial investment in- the metropolitan railways system and modest investment in the road system along with demand management.' In the Atkins plan, 69% of expenditure is on railways, 9% is on buses and ferries and only 22% on highways, of which 2.7% consists of 'road-over and road-under bridges' to replace level crossings. This makes it clear that it would be more feasible and economical to spend more on improving the failing rail system than to spend crores on projects that have several negative effects.

**ON A PERSONAL NOTE**

In the past few years that I have taken an active interest in environmental issues of Mumbai, I have noticed that the level of awareness and concern among the common, educated people has begun to rise. Even before 26/7, people had realized that something disastrous was in the offing, just that they did not expect it to happen so soon. Now, they do not want to merely blame the government for the various violations of environmental laws but also make it accountable to them. They are ready to take up the reins in their hands and want to work with the environmentalists rather than having a few of them fighting for them. This, in my opinion, is the change in attitude that Mumbai needed. If the people of Mumbai push for change, the pressure will mount on the government, yielding desired changes. I mean to say that if the citizens co-operate show willingness to solve these problems by using the Right to Information

Act and other fundamental rights, the environmentalists shall receive the support that they need.

This, however, is a Utopian dream and it shall take a long period of time for it to materialize. Meanwhile, a start has been made in the right direction by environmental groups like BEAG and individuals like Debi Goenka and Bittu Sehgal. The law also fortunately seems to recognize the gravity of Mumbai's problems and in the recent past has passed many eco-friendly laws.

However, I feel these efforts need to be supplemented by the public of Mumbai. Few citizens' groups are trying to introduce concepts like garbage segregation, vermiculture and water harvesting techniques in their localities. However, these efforts are by and large isolated. This is due to two factors- public apathy and lack of government support to citizen initiatives. The first is the most difficult to address since the people have to cultivate a sense of civic duty which cannot be imposed upon them. On the other hand, the government is doing little to encourage citizen participation in civic affairs. Concepts like Advanced Locality Management (ALM) exist only on paper. In reality, citizen councils formed under this scheme require to co-ordinate with a civic official who rarely offers support. Nevertheless, the citizens need to realize that they have to keep fighting without relent if they have to save their city. The civic authorities have been too used to ignoring such issues and they have to be held accountable by vigilant citizens. Also, the all-empowering tool of the law needs to be made more pro-environmentalist. Presently, environment groups file public interest litigations (PILs) in the courts with all other groups. Provisions need to be made to expedite such cases since immediate judgment is most effective in such situations, given the authority and influence of the defendants. Green benches on the lines of the ones introduced in Kolkata in 1993 need to be increased in Mumbai.

In conclusion, I would like to say that the future existence of Mumbai depends upon her environmental conditions and any development plans for Mumbai without taking them into account would be futile and could spell doom for the city.

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