

# Sustainable Quality of Environment – A Study of Pune City

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**ABSTRACT:** Pune is a multi-layered civilisation unit - a hub of economic activities and a driver of the political machine's social revolution. Good environment desire and search for better lives have accelerated the lifestyle in Pune city. The least developed and developing cities are increasing the prime growth in Pune. Pune city is situated on the banks of two rivers, Mutha and Mula, with their confluence towards the northeast. Pune is situated in close proximity (50 km) to the biodiversity of Sahyadri Hills, also known as the Western Ghats.

**KEYWORDS:** Industry, Pollution, Waste Management.

## INTRODUCTION:

Many authorised and planned settlements have provided the inhabitants with necessary civic facilities. The collection and disposal of waste are a public service provision - the estimated amount of sanitation funds and their implementation efficiency vary widely. The public and private sectors are at risk due to the damage caused by activities that impose external costs.

The Sustainable Development Goals promote urban planning as one way to achieve sustainable development. In current conditions, there is an unpretentious claim to reassess the authority of the traditional and local craft, materials, and methodologies to address effectively healthy issues of residential, climatic, resources and especially issues relating to the reassessment in the context of identity and continuity, of socio-cultural patterns in support of vital communities. These standards also cover environmental issues, lifestyles, government bureaucratic procedures, and structural regulations in their legitimate administration<sup>3</sup>.

Pune city's climate is very relaxed throughout the year; during most winter sessions, summer temperatures drop moderately. There are many things to discuss concerning the structure of Pune city. The city's building structures always reflect the region/city climate. The structure of the building and the climate are very interconnected. It is seen that these structures of the building are very dependent on the city's climate.

With reports of diminishing agricultural production and pricing, a changing climate, contaminated air, water, and food, rising poverty and obesity, increasing crime and violence, etc., the new millennium is under stress. Thus, this research tries to analyse possible future scenarios for ecosystems to advise policymakers about the best scientific and technological options for sustainable development in the context of a global exercise. The principles for the planning, construction, development, management & improvement of urban areas were put forth by UN-Habitat's New Urban Agenda. The Urban local body has received plus the status of an Open Defecation Free city & the city's cleanliness has a three-star ranking.

## 1. VENTILATION SYSTEM:

Building structure in Pune city is airing & ventilation is a crucial topic when discussing a town's buildings with excellent ventilation for fresh air to keep the indoor air clear. Therefore, the administrative authorities are always on constant watch to keep pollution within the environment-free limits in Pune. As per Part VIII- Building Services Section, Lighting & Ventilation of the National Building Code of India, if natural lighting & ventilation are not there, then artificial lighting and mechanical ventilation be provided.

## 2. TRANSPORT:

Pune's Sustainable Transport Initiatives - Pedestrian Friendly Street, Pune Bicycle Plan, Public Bicycle Sharing System, Road Ambulance. The Urban local body has planned to adopt "Trenchless Technology" so that digging the roads for laying utilities can be reduced.

## 3. TEMPERATURE REGULATOR:

The building structures in the town should be shaped & designed to regulate indoor/house temperature using suitable materials, such as wood, concrete, or POP. The surface of the building and walls must be made of wood or other material which can control high or low temperatures if the outdoor temperature is higher or lower. The house's shape should also be so designed that it resists higher or lower temperatures. The surface is double-layered, like the outer double-layer wall or the rooftop. Alternatively, there may be an internal POP roof layer. . The Urban local body is actively promoting the adoption of Green Building initiatives in Pune. The Urban local body, Pune and Government offer an additional FAR (Floor Area Ratio) of 3%, 5%, and 7% for Green Buildings rated as Silver, Gold, and Platinum.

## 4. LIGHTING:

Intelligent Lighting for Smart & Sustainable cities – Street lighting improves citizen security & well-being. It will reduce light pollution as LEDs will be set up & fear of crime will be lesser. CCTVs & wireless remote control allow the lighting experience to be tailored.

## 5. URBAN FORESTRY:

Under the Joint Forest Management project, protection and conservation measures have been taken on various hillocks/forests. The Forest Department and Urban local body, with the participation of local stakeholders, are jointly doing these projects. The

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<sup>3</sup> [www.surveyofindia.gov.in](http://www.surveyofindia.gov.in)

development of forest land will be helpful to the urban area through Groundwater recharge, Soil conservation, Biodiversity conservation, regulation of climate, and Carbon sequestering (Pollution Control). The urban local body had reserved Bio-diversity Parks to restore the local flora and fauna, produce carbon sinks, and create awareness about nature conversation. Pune city will be taking the 'People's Biodiversity Register' for which Biodiversity Committee will be formed.<sup>4</sup>

#### **6. AIR QUALITY:**

Pune currently has 15 air pollution monitoring stations operated by Government Pollution Control Board & IITM, and even Pune maintains environmental monitoring stations. Government vehicles are taxed based on the Bombay Motor Vehicle Tax Act 1958 provisions. The law bans industries from releasing any air pollutants more than the limits the State Pollution Control Board has laid down (Act, 1981). If they do, the person in charge of the establishment has to immediately notify the State Pollution Control Board (Act, 1981). They have to pay for any corrective measures that the agencies undertake to reduce the impact of such harmful emissions (Act, 1981) as per the polluter pays principle.

#### **7. SLUDGE AND SOLID WASTE:**

Sewage sludge and animal waste are used as fertilisers in India and are among the primary heavy metal sources in groundwater. Home sludge and solid waste are high in Cu, Pb, Ni, Zn, Cr, Cd, and Mn. The Urban local body sewage treatment plants are working efficiently. In addition, municipal solid waste generation in Pune is amongst the highest at 1600-1700 tons/day. The Mula & Mutha rivers have been faced with severe pollution issues by sewage and solid waste. For which issues has Urban local body initiated the river development project where it envisages keeping the river clean and making it pollution-free, reducing flooding risks. As per UDCPR – 2017 Section 36, it is mandatory for housing, complexes, commercial establishments, hostels, and hospitals whose built-up area is more than 4000 sq.m or more to have a solid waste management system. Partnership projects are run by an Urban local body for a zero garbage ward model and offer a solution for eco-friendly Ganesha immersion.

#### **8. URBANISATION EFFECT ON WATER QUALITY:**

Urban local body is planning to set up Automatic Meter Reading (AMR) system throughout the city. Urban local body is also planning to set up Hydraulic modelling and GIS Mapping. Use consumer data in Hydraulic modelling, water audit, and demand-supply analysis. According to the Water Supply and Sewerage departments of Urban Local Bodies, only 71% of the total generated sewerage in the city is treated. As per the City Sanitation Plan, 2012, a shifting trend was observed during Festivals like Ganesh Utsav celebrations, where manuals/ idols are immersed at immersion tanks constructed at various places in the city by the Urban local body. The Urban local body has planned on reviving the riverfront in the heart of the city. Clear river stretches, gardening around river areas, building dams, reducing floods, enhancing rivers' connectivity, and cycling routes along the riverfront promenades are some of the specifications of the River Rejuvenation Project.

An agreement was signed for the reduction of river pollution in Pune. It provides for constructing new Sewage Treatment Plants, GIS Mapping of sewerage facilities, and the augmentation of 4 Intermediate Pumping Stations. Construction of 24 Community Toilets in slum areas to check open defecation along river banks. The objective is to improve water quality & river ecology as well as stop pollution of the Mula- Mutha river.

The Urban local body has decided to launch mobile toilets exclusively for women. These toilets would be designed by modifying PMPML buses that are no more in use for commuting purposes.

#### **9. ECO-HOUSING CONCEPT- PUNE CITY:**

The urban local body gives tax rebates to housing projects having rainwater harvesting schemes. It has adopted the Eco Housing scheme in which green buildings are promoted. The "Eco-Housing certification programme" was launched by the urban local body in 2005 with technical assistance from the United States Agency for International Development (USAID), which calls for compliance with set assessment parameters which have been Residential, 31.6% Transport, 18.7% Commercial, 9.5% HT Electricity, 24.1% Waste, 7.1% Industrial, 7.9% Others, 1.2% developed by the Science and Technology Park (STP), the University of Pune, International Institute for Energy Conservation (IIEC) and the Energy Resources Institute (TERI). The eight focus areas necessary for obtaining the certification include site planning, environment architecture, energy-efficient lighting, solar water heating, eco-friendly building material, water management, waste management and other innovative technologies taken by builders voluntarily.

Each area has been assigned points depending on the immediate impact on the environment and its relevance to local conditions. Based on the points achieved, the developer is given an eco-housing rating. The main aspects of eco-housing that the urban local body has planned to implement are Rainwater Harvesting, Solar Energy (Compulsory to all high-rise buildings and star hotels, Encouraging the use of solar systems for heating purposes on a wider scale), Recycling (Considered for centrally air-conditioned buildings Waste Water, Recycling Plant compulsory for townships & building (tenements >150)), Green Architecture (Fringe villages 15% of additional amenity space for layouts above 1 acre. Adopt climate, responsive design practices to achieve thermal comfort (NBC)), Ecofriendly building (Promote such aspect, conducting seminars and exhibitions Mandatory use of 25%, pozzolana material Blended Portland Cement (BPC)).

#### **10. ENERGY CONSERVATION:**

The urban local body has encouraged the use of Renewable Energy by giving an exemption of 5% property tax for Housing Societies that run any one of the projects below and a 10% tax exemption for those who implement any two of the projects below:

- 1) Vermicomposting Unit
- 2) Use of Solar Energy
- 3) Rain Water Harvesting.

As per the report of ESR, 2011, it was recorded that in the year 2010, 12,003 properties benefited from the scheme.

<sup>4</sup> [https://UrbanLocalBody.gov.in/informpdf/CDP/3\\_CDP\\_Environment\\_Disaster\\_Mgt\\_heritage\\_Vision.pdf](https://UrbanLocalBody.gov.in/informpdf/CDP/3_CDP_Environment_Disaster_Mgt_heritage_Vision.pdf)

Pune- Maximum Solar City- Awareness has been created to make solar energy usable throughout the city. Urban local body is ready to set up Rooftop Solar.

#### 11. GREENHOUSE GAS MITIGATION (GHG):

As per the draft report of the TERI study on the Carbon Inventory of Pune City, the maximum emission of CO<sub>2</sub> is from the residential (31.6%) due to the consumption of electricity and petroleum, followed by HT electricity, then the transport sector. These are the key areas which need to be reduced in CO<sub>2</sub> emission. Stringent rules to effectively implement the initiatives already taken by the Urban local body like Eco Housing Concept and preventive measures in abating pollution etc. The recommendations for reduction from the sectors must be followed through a monitoring mechanism and the Performance Index. Some of the recommendations may be implemented, including the Carbon Credit Certification to reduce GHG emissions at the city level include technology improvements, which include: public transportation systems and solar streetlights; policies, such as the implementation of building codes and recycling requirements; and Other voluntary actions, including awareness campaigns and recognition programs. For sectors such as transport, it is important to recognise that combining interventions is more successful than individual interventions. Monitoring of Environmental Management Plans (EMPs) for various proposed projects in Pune City.

#### 12. EXISTING ENVIRONMENTAL REGULATIONS – PUNE CITY

The Environment Protection Act of 1986 is one measure taken by the Government of India. This act empowers the Central Government to establish authorities to prevent environmental pollution in all its forms and tackle specific environmental problems peculiar to different parts of the country.

As per the Twelfth schedule (Article 243 W) clause 8 of the Constitution of India, all Municipal Corporations must protect the environment & promotion ecological aspects. Thus as a regulatory and controlling authority for the development of the cities, Municipal Corporations have to play a major role in this scenario.

The Government Pollution Control Board (MPCB) implements a range of environmental legislation in the state of Government. The MPCB functions under the administrative control of the Environment Department of the Government of Government. It is mainly responsible for the following:

- Water (Prevention and Control of Pollution) Act, 1974,
- Air (Prevention and Control of Pollution) Act, 1981,
- Water (Cess) Act, 1977

Some of the provisions under the Environmental (Protection) Act, 1986 and the rules framed under this like:

- Biomedical Waste (M&H) Rules, 1998,
- Hazardous Waste (M&H) Rules, 2000,
- Municipal Solid Waste Rules, 2000 etc.

The other regulations governing the solid wastes generated in the city are as follows:

- The Batteries (Management and Handling) Rules, 2001. The Recycled Plastics Manufacture and Usage Rules, 1999 (as amended subsequently)
- The Government Plastic Carry Bags (Manufacture and Usage) Rules 2006. For all three rules, the implementation levels need to be considerably increased.
- C&D waste should not be mixed with MSW for disposal. The urban local body generates approximately 250 MT per day of C&D waste from various sources. District administration has already allocated 2 acres of land at Wagholi, Pune, for C&D waste processing.
- The Urban local body has sanctioned the setting up of a plant to the process used sanitary napkins and diapers at Uruli. The capacity of this plant will be eight metric tonnes per day.
- Similarly, there is no prevailing regulation for Electronic Waste (E-waste), and no management guidelines have been specified.

According to Unified Development Control And Promotion Regulations For Government State, an Environmental clearance certificate shall be submitted for the project as may be prescribed by the Ministry of Environment from time to time.

#### 13. NON-GOVERNMENTAL ORGANISATION:

Sustainable development is the focus of civil organisations. Urban planning, sustainable agriculture, the environment, and urban transportation are their primary areas of interest. These organisations have been leading in addressing the important problems in their primary focus area. They have effectively intervened in any loopholes in policies at the local, regional and national levels.

#### OVERVIEW:

The Urban local body makes many developments to make Pune city with the best sustainable environmental quality with a few of the actions mentioned below<sup>5</sup>:

- The Urban local body has embraced end-to-end automation and waste collection and management monitoring with a cutting-edge mobile/web application to improve bottom-level waste management and recycling mechanisms.
- For incorporating more facilities at existing landfill sites, new technological equipment, and projects taken up by the Municipal authorities.
- Adequate human resources, lighting facilities, gas release provision, and on-site weighing facilities have been encouraged through various incentives and awards for SWM and sanitation in 2015, and many more.
- The Urban local body has made solid waste treatment plants and provisions for separating or estimating solid waste through one of the key project partners launched a cleanliness campaign. It has helped treat waste generated by the drain, homes for slaughter, construction, or waste. The cleanliness in the city is improving as the waste disposal frequency rate is increasing daily.
- The Urban local body uses cutting-edge technologies like GPS, GSM, RFID, M2M, IOT Sensors, and innovative Mobile and web application to improve and smoothen ground-level mechanisms for waste collection and efficient processing and recycling of waste.

<sup>5</sup> <https://www.UrbanLocalBody.gov.in/en/swm>

Many organisations and private enterprises have been authorised by the urban local body to collect, reuse, recycle and channel e-waste (Authorisation letter) according to the Government's rules for dealing with hazardous waste (e-waste flier). Seemingly harmless batteries, mobile phones, chargers, etc., pose a grave danger to the environment and people when improperly disposed of. Collection bins can be set up in schools, campuses, offices, shopping malls, etc.

The citizens also have the facility to register a complaint about their environmental concerns to Municipal Authorities for nuisance in Municipal Areas.

**CONCLUSION:**

The above analysis shows that the quality of the environment in Pune city continues unabated and is being stopped or reversed through the abovementioned projects and schemes. The predominant lesson is that a new lifestyle, new ways of living, housing, and a new social structure with divergent civic and social needs have been experienced throughout human history. The steady shift from agriculture and rural to industrial and urban economies has created various civic, social, and economic changes in Pune city. Thus, it has enabled residents to become fully aware of civic life's modern facilities and benefits.

The Air (Prevention and Control of Pollution) Act, 1981, Compensatory Afforestation Fund Act, 2016, The Energy Conservation Act, 2001 etc., have been enacted by the Indian Parliament. The need for protection & conservation of the environment & sustainable use, these enactments look up its regulation and control. These Acts establish regulatory bodies and set up regulatory authorities and tribunals to overview environmental-related issues and concerns. The effective implementation of these legislations is to be done by the respective executing authorities.