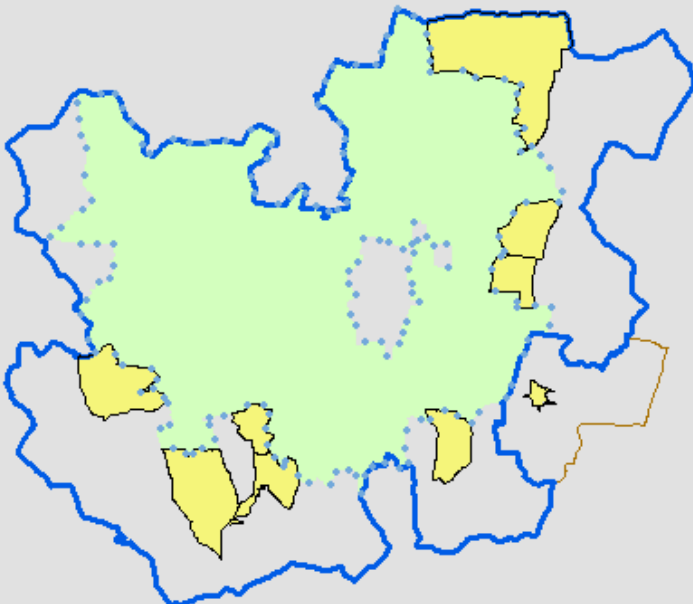




**Report on
Draft Development Plan
of
Pune Municipal Corporation
(Extended Limit 09 Villages)
2025-2045**



**Published under section 26 (1)
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**DRAFT DEVELOPMENT PLAN OF
PUNE MUNICIPAL CORPORATION
(EXTENDED LIMIT 09 VILLAGES)
2025-2045**

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**Draft Development Plan of Pune Municipal Corporation
(Extended Limit 09 Villages)**

&

Assistant Director of Town Planning, Pune Branch, Pune

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LIST OF ABBREVIATIONS

DP – Development Plan
ELU – Existing Land Use
PLU – Proposed Land Use
RP – Regional Plan
PMR – Pune Metropolitan Region
PMRDA – Pune Metropolitan Region Development Authority
PMC – Pune Municipal Corporation
PCMC – Pimpri Chinchwad Municipal Corporation
ULB – Urban Local Body
M RTP Act – Maharashtra Regional and Town Planning Act, 1966
BPMC Act – Bombay Provincial Municipal Corporations Act, 1949
TPS – Town Planning Scheme
NTDA – New Town Development Authority
ETS – Electronic Total Station
GNSS – Global Navigation Satellite System
GPS – Global Positioning System
UTM – Universal Transverse Mercator
IDF – Intensity-Duration-Frequency
STP – Sewage Treatment Plant
MLD – Million Litres per Day
TMC – Thousand Million Cubic Feet
ESR – Elevated Service Reservoir
NRDWP – National Rural Drinking Water Programme
SCADA – Supervisory Control and Data Acquisition
GIS – Geographic Information System
CMP – Comprehensive Mobility Plan
TOD – Transit-Oriented Development
NMT – Non-Motorized Transport
NUTP – National Urban Transport Policy
IRC – Indian Roads Congress
UTTIPEC – Unified Traffic and Transportation Infrastructure (Planning & Engineering) Centre
MCGM – Municipal Corporation of Greater Mumbai
NMMC – Navi Mumbai Municipal Corporation
H THS – Hill Top – Hill Slope

MoEFCC – Ministry of Environment, Forest and Climate Change
NPCA – National Plan for Conservation of Aquatic Ecosystems
SWM – Solid Waste Management
MSW – Municipal Solid Waste
LEED – Leadership in Energy and Environmental Design
GRIHA – Green Rating for Integrated Habitat Assessment
IGBC – Indian Green Building Council
GIPE – Gokhale Institute of Politics and Economics
NDA – National Defence Academy
FTII – Film and Television Institute of India
NCL – National Chemical Laboratory
NIV – National Institute of Virology
URDPFI – Urban and Regional Development Plans Formulation and Implementation
Guidelines
NUHM – National Urban Health Mission
NBC – National Building Code
MMC Act – Maharashtra Municipal Corporation Act
SWM Rules – Solid Waste Management Rules, 2016
BARC – Bhabha Atomic Research Centre
UDCPR – Unified Development Control and Promotion Regulations, 2020
APMC – Agricultural Produce Market Committee
PS – Primary School
HS – High School
PHC – Primary Health Centre
PG/CPG – Play Ground / Children’s Play Ground
G/PK – Garden / Park
FSI – Floor Space Index
EWS – Economically Weaker Section
LIG – Low Income Group
GSR – Ground Service Reservoir
ZP – Zilha Parishad
MTPD – Metric Tonne Per Day
RDF – Refuse Derived Fuel
MRF – Material Recovery Facility
GoM – Government of Maharashtra
UT – Uttam Nagar

RK – Room-Kitchen
MIG – Middle Income Group
HIG – High Income Group
EMI – Equated Monthly Installment
RR – Ready Reckoner
ITI – Industrial Training Institute
FAR – Floor Area Ratio
TDR – Transferable Development Rights
SEZ – Special Economic Zone
ITES – Information Technology Enabled Services
PPP – Public-Private Partnership
CBD – Central Business District
CDP – Comprehensive Development Plan
R&R – Rehabilitation & Resettlement
BRTS – Bus Rapid Transit System
CAPEX – Capital Expenditure
RESCO – Renewable Energy Service Company
MW – Megawatt
LULC – Land Use Land Cover
GHG – Greenhouse Gases
HFC – Hydrofluorocarbons
PFC – Perfluorocarbons
SF₆ – Sulphur Hexafluoride
NF₃ – Nitrogen Trifluoride
CSCAF – Climate Smart Cities Assessment Framework
GCOM – Global Covenant of Mayors for Climate & Energy
LARR – Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
RFCTLARR Act – Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
SOR – Schedule of Rates
RCC – Reservation Credit Certificate
CAA – Constitutional Amendment Act
DPDC – District Planning and Development Committee

CHAPTER 1 : PUNE CITY AND ITS REGIONAL SETTINGS

Introduction

The historical city of Pune is situated at the confluence of the Mula and Mutha rivers. Strategically located in Western Maharashtra, it lies at an almost equal distance from other major cities and district headquarters in Western and Southern Maharashtra, such as Mumbai, Thane, Alibaug, Nashik, Kolhapur, and Solapur. Pune has long been a center of attraction due to its excellent accessibility, pleasant year-round climate, world-class educational institutions, abundant natural resources, and diverse job opportunities. Its proximity to Mumbai, the financial capital of India, has further opened numerous avenues for growth and development.

The city is home to renowned research institutes, rapidly expanding industries, and thriving IT hubs. Tracing the history and major milestones of Pune's development provides valuable insights into its growth patterns and the defining characteristics of its expansion, including in the newly merged nine villages within its planning area. Additionally, examining the influence of climatology and the city's regional setting offers a deeper understanding of how these factors have shaped Pune's overall growth trajectory. The following sections present information on these aspects and their impact on the city's development.

1.1 History of Pune

The city of Pune has a history spanning nearly twelve hundred years. The Pataleshwar cave temple on Jangali Maharaj Road stands as evidence of its ancient origins. Over the centuries, this region came under the rule of the Traikutakas, Rashtrakutas, Chalukyas, Shilaharas, and Yadavas. In the later period, the Mughals and the Adilshahi dynasty-controlled Pune until the rise of the Marathas. Historical records also mention Pune by various names, including *Punyavishay*, *Punakwadi*, *Punnak*, and *Punyapur*.

Kasba Peth, earlier known as Kasbe Pune, was the earliest settlement in the city. Gradually, other neighborhoods developed around it, such as Shaniwar Peth, Somwar Peth, and Raviwar Peth. Shri Shahaji Raje Bhosale, father of Chhatrapati Shivaji Maharaj, was granted the *jagir* of Pune. Chhatrapati Shivaji Maharaj, the founder of the Maratha Empire, spent his childhood here with his mother, Rajmata Jijau, at the Lal Mahal

Chhatrapati Shahu Maharaj, the successor of Chhatrapati Shivaji Maharaj and Sambhaji Maharaj, appointed Shri Balaji Vishwanath as the Peshwa of the Maratha Empire, establishing Pune as the seat of the Peshwas. His successor, Shrimant Bajirao-I, significantly expanded the city. During his reign, the iconic Shaniwar Wada was built on the banks of the Mutha River as the official residence of the Peshwas.

In 1750, during the reign of Bajirao Peshwa I (1740-1761), two water reservoirs were constructed at Katraj, about seven kilometers from the city. An underground aqueduct system, designed as an arched tunnel located two to three meters below the ground, was built to carry water from the Katraj reservoirs to Shaniwar Wada. The tunnel measured

approximately 80 cm in width and about two meters in height, allowing a person to walk through it comfortably along its entire length.

According to available records, a total of four major aqueducts were constructed during the Peshwa period. The following table summarizes the details of Pune’s water supply system in that era-

Table 1.1 Details of aqueducts built earlier

Sr. No	Name	Built By	Built Year	Daily supply in gallons	Source	Distance / Direction from Pune (Approx)
1	Katraj	Balaji Bajirao	1750	6,50,000	2 dams in Katraj	6.5 km/ South
2	Chaudhari	Rupram Chaudhari	Post 1790	50,000	Springs	11 km/ Southwest
3	Fadnavis	Nana Fadnavis	1790	1,00,000	Well in Narhe - Ambegaon	9.5 km/ South
4	Raste	Sardar Raste	Post 1790	50,000	Spring	11 km/ Southwest

(Source: ISSN 2347 – 5463 Heritage: Journal of Multidisciplinary Studies in Archaeology 4: 2016)

In 1818, after the annexation of the Maratha Empire, the British established the Khadki Cantonment on the north bank of the Mutha River, to the north-east of Pune. Several defence establishments were set up here, including the Ammunition Factory, Ordnance Factory, Army Workshop, and HEMRL. The Mumbai–Pune railway line became operational in 1856, further strengthening connectivity. To meet the increasing water demand of Pune and the Cantonment, the Khadakwasla Dam was constructed in 1880.

During the late 19th and early 20th centuries, many reputed educational institutions were founded in Pune, such as Deccan College, Bhandarkar Institute, Gokhale Institute, College of Engineering Pune, Fergusson College, Brihan Maharashtra College of Commerce, B.J. Medical College, Wadia College, Sir Parshurambhau College, and the Bharat Itihas Sanshodhak Mandal.

After India’s independence in 1947, Pune witnessed rapid growth and gradually transformed into a modern city. The education sector expanded further with the establishment of the University of Pune (now ‘Savitribai Phule Pune University’) in 1949, the National Chemical Laboratory in 1950, the National Institute of Virology in 1952, and the National Defence Academy in 1955. Today, the city hosts several national-level defence and research establishments, along with many reputed private institutions and universities.

Pune, known as the cultural capital of Maharashtra, lives up to its reputation with world-renowned institutions such as Bharat Gayan Samaj, Gandharva Mahavidyalaya, and the Film and Television Institute of India. It has also nurtured many stalwarts in the fields of

art, culture, and heritage. The city's cultural ecosystem remains vibrant, with a year-round calendar of art exhibitions, film festivals, theatre productions, literary festivals, street plays, music concerts, workshops, and other cultural activities. Pune also houses several museums of significance, including the Aga Khan Palace Museum, Raja Dinkar Kelkar Museum, Mahatma Phule Museum, and Vishrambaug Wada Museum.

Once known as the “city of bicycles” and the “city of pensioners,” Pune has now evolved into a modern and dynamic metropolis. It is celebrated as a hub of education, IT, culture, literature, and food, while also establishing itself as a growing economic centre making a mark on the global map

1.2 Industrial and Economic Development of Pune

Since the 1950s and 1960s, the Pune region has developed strong industrial roots with manufacturing, automobile, glass, sugar, and forging industries. Over time, it has expanded into a major industrial hub, attracting several multinational companies in both the automotive and information technology sectors.

The Hinjewadi IT Park, established by the Government of Maharashtra in 2003, marked a turning point in Pune's IT growth. In recent years, new IT hubs have also come up in Kharadi, Magarpatta, Kalyani Nagar, Bopodi, and other areas. The city is also home to the Serum Institute of India, the world's fifth-largest vaccine producer by volume. Another key initiative, the Pune Food Cluster Development Project, supported by the World Bank, has promoted the growth of fruit and vegetable processing industries in and around the city.

The Maharashtra Industrial Development Corporation (MIDC) has played a key role by developing major industrial areas along important corridors such as Mumbai-Pune (Pimpri-Chinchwad), Pune-Nashik (Chakan-Bhosari), Pune-Ahilyanagar (Ranjangaon), Pune-Satara (Shirwal), Pune-Solapur (Hadapsar), and Pune-Mangaon (Pirangut). In addition, private industrial estates have also contributed to the region's industrial growth. Connectivity has further boosted development. The Yashwantrao Chavan Expressway, India's first six-lane concrete, high-speed tolled expressway, has become the main growth corridor linking Pune with Mumbai.

Today, Pune supplies skilled manpower on a large scale, supporting both domestic and global industries and strengthening its position as a leading growth centre.

1.3 Regional Setting, Geographical Conditions and Climatology of Pune City & the Nine Villages

Pune city serves as the headquarters of Pune District as well as the Pune Metropolitan Region, and functions as the main growth centre of the region. It is located in the western part of the Deccan Plateau, on the leeward side of the Western Ghats. The city lies to the southeast of Mumbai, the state capital of Maharashtra, at a distance of approximately 160 km. Geographically, Pune is positioned at 18.32° N latitude and 73.51° E longitude, with an average elevation of 560 metres above mean sea level. The city is situated at the confluence of the Mula and Mutha rivers, both flowing west to east. The Ram River joins the Mula at Baner, while the Indrayani River touches the city boundary near the northeast corner of Lohgaon village. The highest point within the jurisdiction of the Pune Municipal Corporation is at Yewalewadi, with an altitude of 1,014 metres.

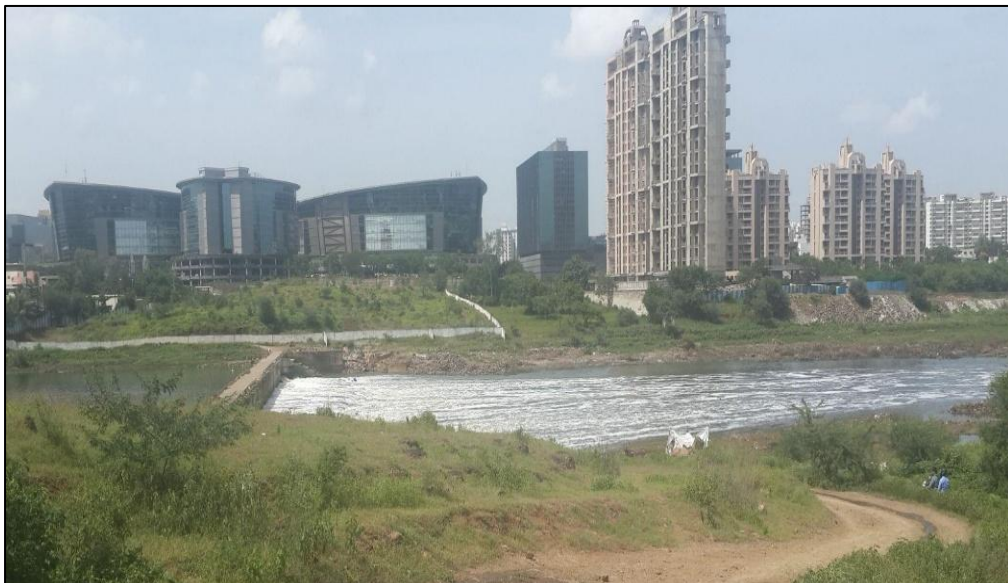
Pune and its surrounding region are ringed by a chain of hills stretching from the west to the south, with several outcrops visible within the city itself. Prominent among these are Pachgaon Parvati, Hanuman Tekdi, Vetat Tekdi, Panchavati Hills, Ram Tekdi, and Tukai Tekdi. The city's topography is broadly saucer-shaped. With the recent expansion of the PMC limits, the municipal boundary has extended up to the hills of Dive Ghat.

The nine newly merged villages are located in the urban fringe. Among these, Ambegaon Khurd and Dhayari contain significant hill tracts, while the remaining villages are largely characterised by flatter terrain. Natural streams are found across most of the villages, with the Mutha River flowing along Shivane, Shivane-Uttamnagar, and Mundhwa-Keshavnagar, while the Indrayani River runs along the boundary of Lohgaon.

Figure 1.1 Southern Hills- Ambegaon Khurd



Figure 1.2 Mula Mutha River at Mundhwa



The latitude, longitude describing the regional location of the nine villages along with the highest and lowest altitude are described in the following table.

Table 1.2 Highest and lowest altitude in nine villages

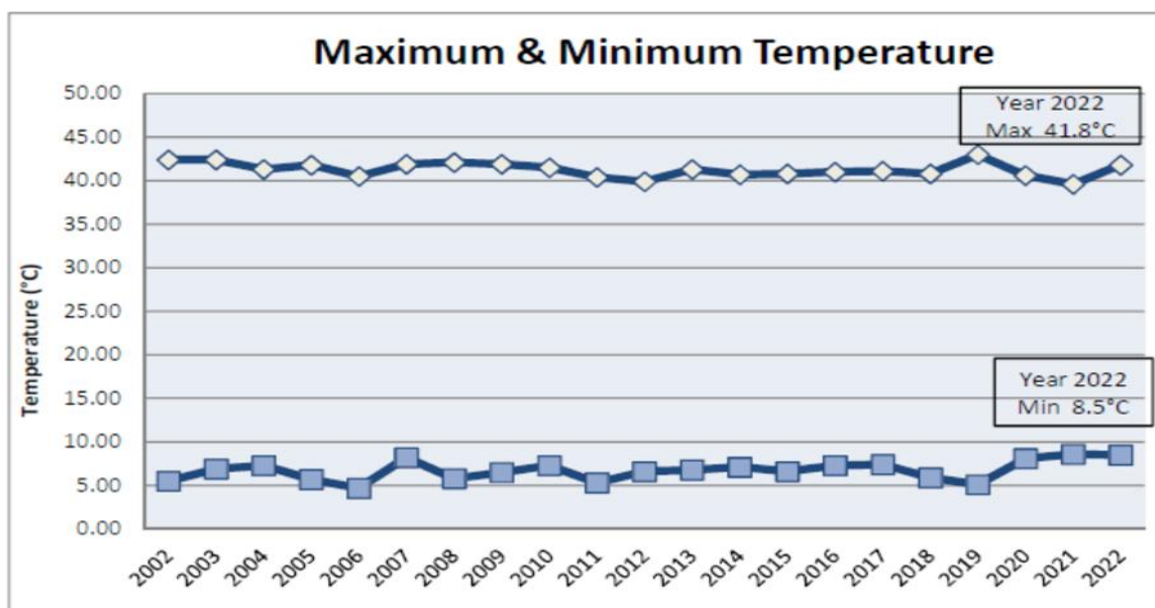
Sr. No	Village	Latitude	Longitude	Altitude(meter)	
				Highest	Lowest
1	Lohgaon	18°37'7.608"N	73°55'3.074"E	705	550
2	Mundhwa	18°31'25.016"N	73°57'9.436"E	560	530
3	Hadapsar	18°30'34.227"N	73°56'48.438"E	560	550
4	Undri	18°26'2.437"N	73°54'52.049"E	675	610
5	Ambegaon Budruk	18°27'40.372"N	73°50'29.482"E	665	585
6	Ambegaon Khurd	18°25'47.556"N	73°51'6.289"E	815	625
7	Dhayari	18°24'18.45"N	73°49'16.084"E	975	585
8	Shivane & Shivane (Entire Uttam Nagar)	18°29'0.178"N	73°45'56.859"E	750	550

1.3.1 Climate

Pune experiences three main seasons - summer, monsoon, and winter. The monsoon generally begins in early June, bringing moderate to heavy rainfall. Winter, from mid-November to mid-February, is marked by cool nights and pleasantly warm days. A short spring season from mid-February to March offers clear skies, comfortable days, and cool nights, making it the most pleasant time of the year. Summer extends from early April to late May, with comparatively higher temperatures.

1.3.2 Temperature

The city maintains a generally moderate temperature in the range of 20°C to 30°C for most of the year.

Figure 1.3 Maximum and minimum temperature for past 20 years

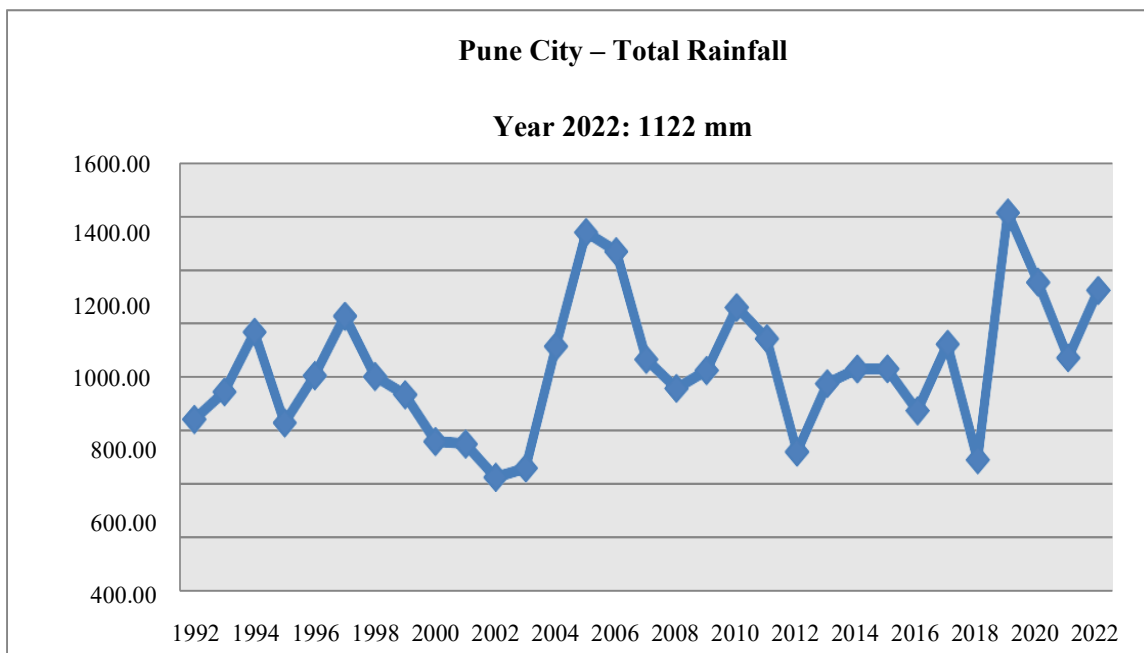
(Source: Environmental Status Report 2022-2023, PMC)

However, during peak summer, the temperature may rise up to around 40°C, while in winter it can drop to nearly 7°C. The highest temperature in Pune in the year 2022 is 41.8 °C on 29 April and a minimum of 8.5°C on 25 January.

1.3.3 Rainfall

Rainfall is the primary source of water for rivers, lakes, and aquifers in the region. Pune district has 20 rainfall stations, including two in the city (Pune Observatory and Wanawadi-AFMC). The city receives moderate rainfall, mainly from June to October under the southwest monsoon, with July being the wettest month. IMD records show that the lowest rainfall occurred in 2002, while the highest was recorded in 2019.

Figure 1.4 Rainfall (mm) for past 30 years



(Source: Environmental Status Report 2022-2023, PMC)

1.3.4 Relative Humidity

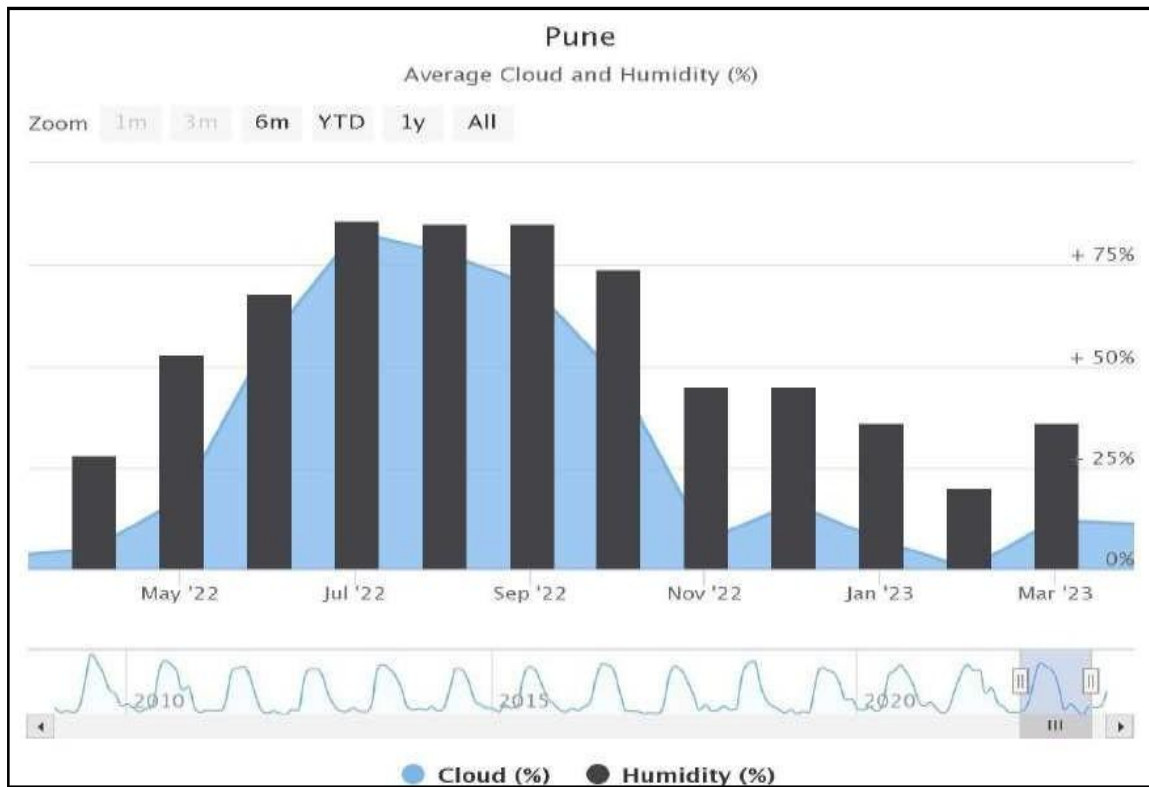
Humidity in the region depends on the surrounding temperature. Relative humidity indicates the amount of moisture present in the air.

Table 1.3 Relative humidity status of Pune city, 2021

Months	Relative Humidity (%)	Interpretation
January	56	Humid (50-75%)
February	46	Dry (25-50%)
March	36	
April	36	

May	48	
June	70	Humid (50-75%)
July	79	Very Humid (75-100%)
August	82	
September	78	
October	64	Humid (50-75%)
November	58	
December	58	

Figure 1.5 Average cloud cover and relative humidity (%) in Pune city (2022-2023)

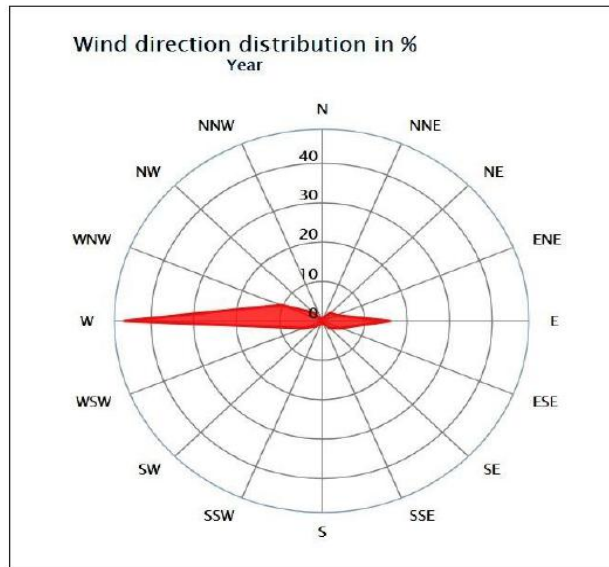


(Source: WorldWeatherOnline.com)

1.3.5 Wind

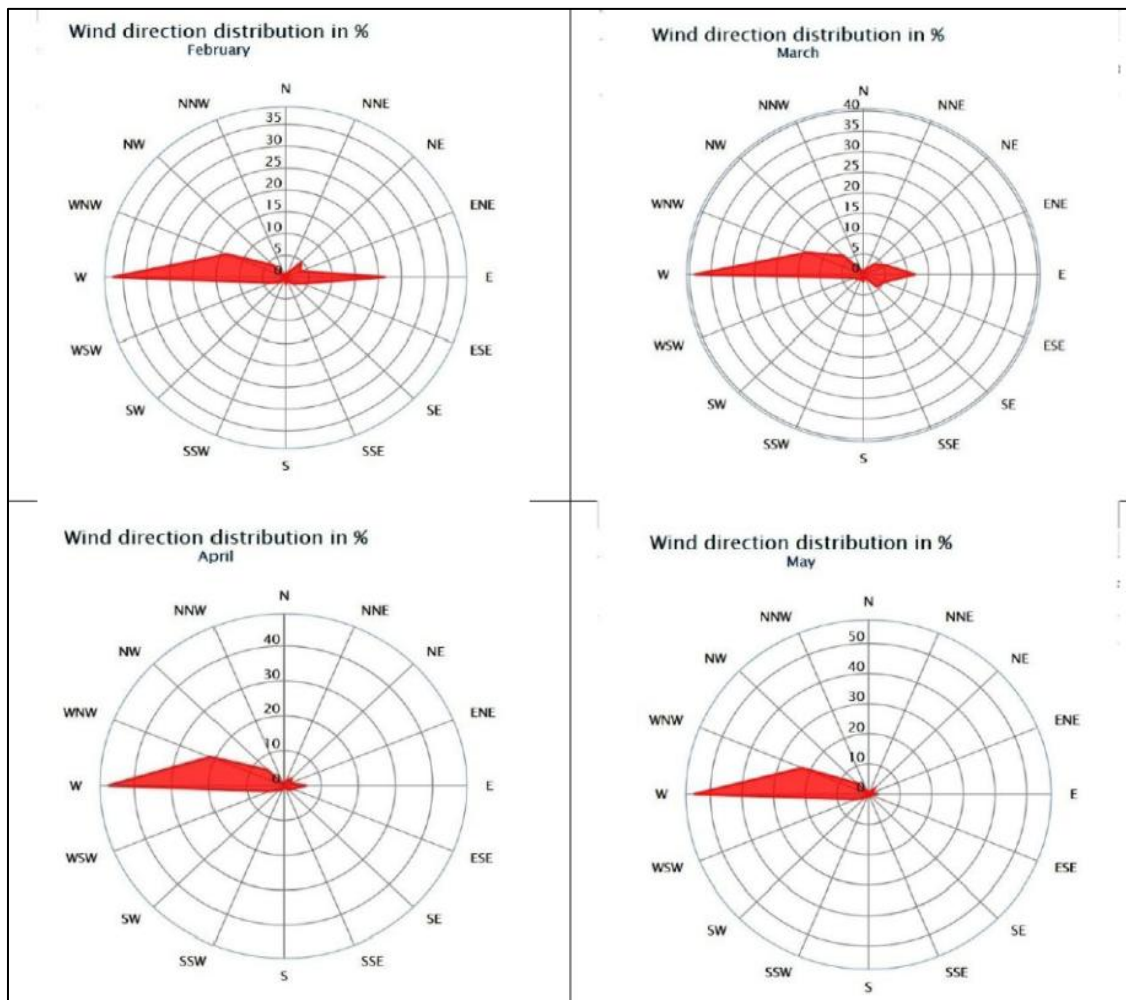
“Wind Rose Diagram” is a graphical representation showing the direction, frequency, and speed of wind at a particular location over a given period. It is commonly used in the planning and design of airport runways, to study sea breezes, to assess air pollution dispersion, and by architects and planners for building orientation and urban design.

Figure 1.6 Wind rose diagram-annual wind speed and direction, Pune (km/h)



(Source: Environmental Status Report 2021-2022, PMC)

Figure 1.7 Wind rose diagram during summer



(Source: Environmental Status Report 2021-2022, PMC)

Figure 1.8 Wind rose diagram during monsoon

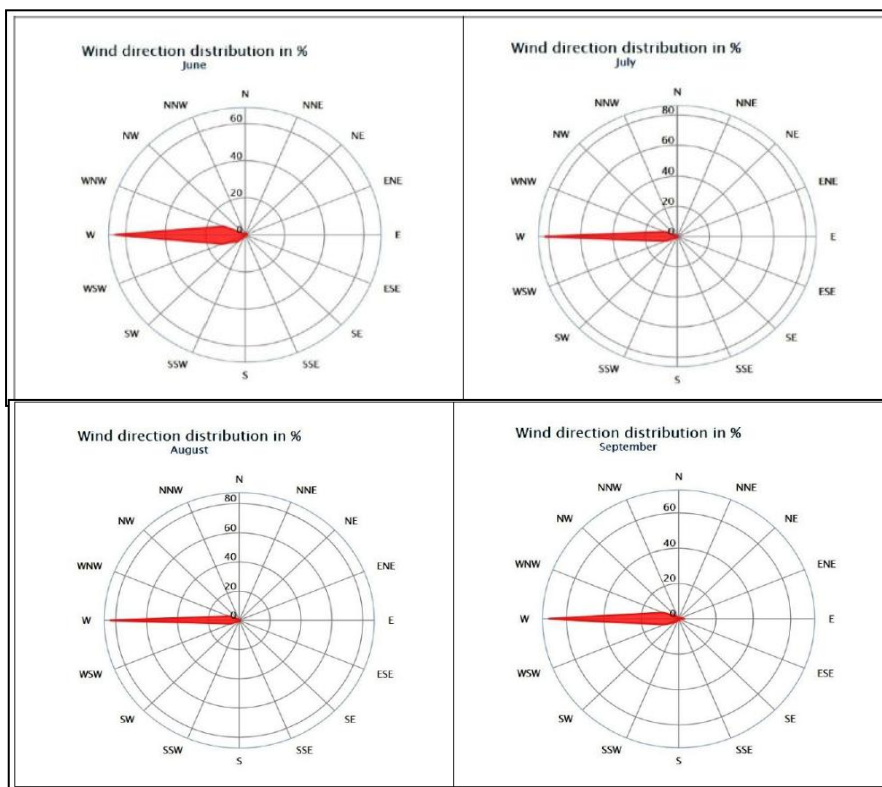
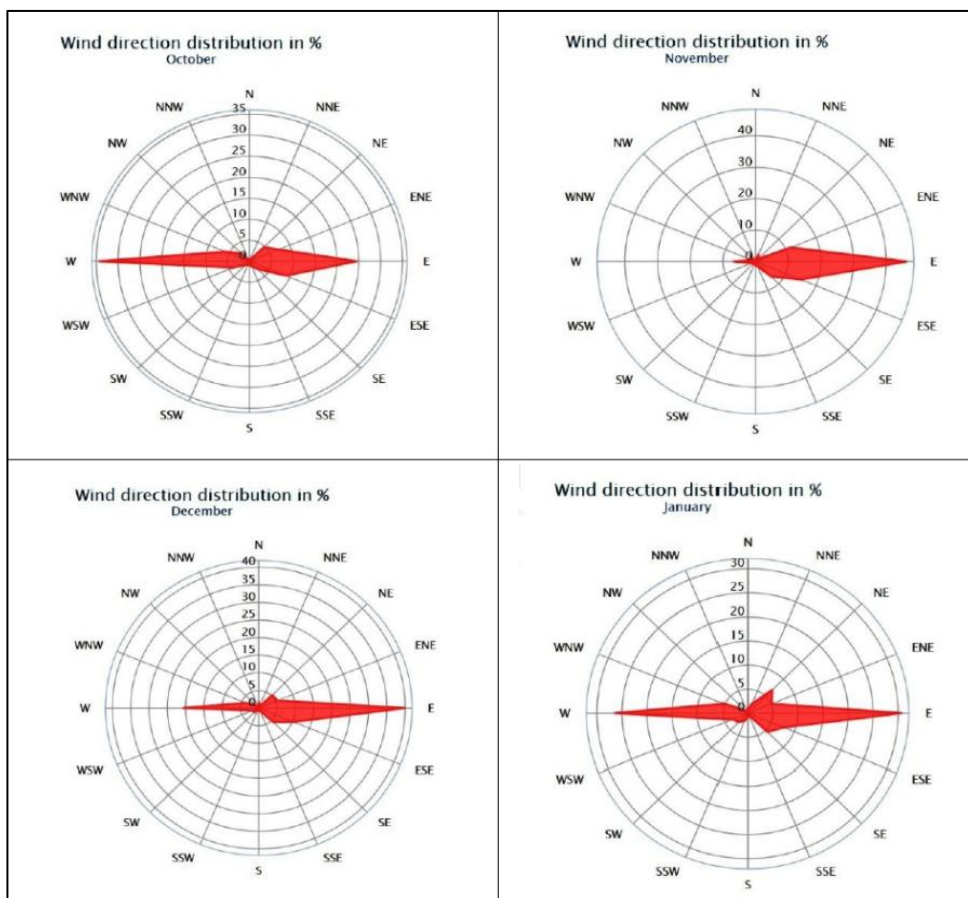


Figure 1.9 Wind rose diagram during winter



(Source: Environmental Status Report 2021-2022, PMC)

The climatology of Pune city also reflects the prevailing environmental conditions of the newly merged nine villages.

1.4 Planning and Administrative Details of Nine Villages prior to merger into PMC limit

The Pune Metropolitan Region (PMR) mainly comprises areas under Pune Municipal Corporation, Pimpri Chinchwad Municipal Corporation, Talegaon and Alandi Municipal Councils, Pune, Khadki and Dehu Road Cantonments, and 129 villages.

The first Regional Plan (RP) (1970–91) for the Pune Metropolitan Region comprised areas around Pune city, Haveli Tehsil (including the newly merged nine villages), and parts of Mawal, Mulshi, and Khed Tehsils. The RP was published on 04/03/1970 and subsequently sanctioned by the Government in February 1976. It was later revised, and the Draft Regional Plan for the Pune Metropolitan Region and the remaining part of Pune District was published in 1993 and sanctioned in November 1997, to come into force thereafter. Two municipal corporations, seven municipal councils, three cantonment boards, and one Nagar Panchayat have statutory plans either in effect or under process as per the relevant provisions of the MRTP Act, 1966, and are excluded from the RP.

The nine villages were under the ambit of separate individual Gram Panchayats, before their merger into the jurisdiction of PMC. The following list shows the Gram Panchayats of the nine villages:

- | | |
|------------------------------------|-------------------------------------|
| 1. Lohgaon (Remaining) | 2. Mundhwa (Remaining Keshav Nagar) |
| 3. Hadapsar (Entire Sadesatranali) | 4. Undri (Remaining) |
| 5. Ambegaon Budruk (Remaining) | 6. Ambegaon Khurd (Remaining) |
| 7. Dhayari (Remaining) | 8. Shivane |
| 9. Shivane (Entire Uttam Nagar) | |

(Note: 'Remaining' word indicates the area of that village which was not included in PMC limit earlier)

Apart from these nine Gram Panchayats of respective villages, the Gram Panchayat of New Kopare was located in Shivane owing to the earlier rehabilitation of residents of Kopare village in S. No. 18, 19 and 103 of Shivane, after it was submerged under the backwaters of Khadakwasla Dam. Eventually, residents of Kopare village rehabilitated in part of Shivane were allotted land in Warje village, which is already under the jurisdiction of PMC. However, some rehabilitated residents still occupy the aforementioned part of Shivane. The New Kopare Gram Panchayat was dissolved, and the area under New Kopare village was included in the PMC limit with the merger of 23 villages into the PMC limit on 30/06/2021.

CHAPTER 2 : EARLIER PLANNING EFFORTS

Introduction

The Development Plan (DP) of a city is formulated to establish scientific and rational policies that address both the functional requirements of the city and the aspirations of its citizens over a horizon of 20-25 years. However, such plans are often criticized for failing to keep pace with rapid urban growth and for being unable to adapt to the evolving development needs of society. Consequently, a significant gap has emerged between the targets set in the plan and the actual on-ground development. Furthermore, disparities are frequently observed between the proposals outlined in the DP and the real development occurring, particularly in peri-urban areas at the city's periphery.

Successive Development Plans are more effective when they incorporate the following:

- i) A review of earlier planning initiatives within the planning area and its surrounding fringe areas.
- ii) Study of the impact of surrounding planning areas or fringe areas on the development of physical and social infrastructure.
- iii) An assessment of the implementation status of proposals from previous DPs.
- iv) Identification of the challenges and constraints faced during implementation.

This chapter provides a brief overview of the earlier planning efforts undertaken for Pune city and its region.

2.1 Earlier statutory provisions regarding Development Plans

Under the Bombay Town Planning Act of 1915, local authorities were authorized to prepare Town Planning Schemes to improve designated areas within their jurisdiction. Later, provisions under Chapter XVI of the Bombay Provincial Municipal Corporations (BPMC) Act, 1949 empowered the Municipal Commissioner to undertake improvement schemes in any part of the city, subject to prior approval from the State Government. These schemes included the rearrangement and reconstruction of streets and buildings, as well as the construction of new structures such as roads and bridges. Additionally, Section 210 of Chapter XIV of the BMC Act, 1949 granted the Municipal Commissioner the authority to prescribe necessary street lines.

2.2 Town Planning Schemes

In accordance with the Bombay Town Planning Act, 1915, the Pune City Municipality initiated the preparation of Town Planning Schemes (TPS) to guide the growth of the expanding town. The first scheme, TPS No. 1, was finalized in 1931. Subsequently, seven more schemes were prepared and finalized in various parts of the city, covering a total area of approximately 2,078 hectares (20.78 sq. km). The details of these schemes are provided below.

Table 2.1 Town planning scheme in Pune city

Sr.No.	Name of town planning scheme	Area (ha)
1	TPS No.1(Bhamburda)	545.60
2	TPS Suburban No.1	19.20
3	TPS No.2 (Somwar Peth, Mangalwar Peth)	20.66
4	TPS Yerawada	162.80
5	Hadapsar Industrial TPS No.1	11.40
6	Hadapsar Industrial TPS No.2	146.00
7	TPS Sangamwadi	452.40
8	TPS No.3 Parvati	720.00

In addition to the town planning schemes mentioned above, the Pune Municipal Corporation (PMC) implemented several road development initiatives to improve connectivity. However, despite the construction of new roads and road-widening projects, the old city areas of Pune remained highly congested. To address this, the Municipality exercised its authority under Section 210 of the Bombay Provincial Municipal Corporations Act, 1949 (now referred to as the Maharashtra Municipal Corporation Act), prescribing regular street lines to regulate building alignments within the old PMC limits.

2.3 Master Plan 1952 for the city

The Pune Municipal Corporation (PMC) was established on 15 February 1950, and the preparation of a Master Plan was initiated soon after its formation. A Draft Master Plan for Greater Poona was first prepared by the Corporation in 1952. This plan was approved, with certain modifications, through Resolution No. 76 dated 27 April 1955. The plan covered an area of 107.43 sq. km and was designed for a projected population of 485,485.

2.4 Development Plan 1966

Although a Master Plan for Poona had already been prepared in 1952, the State Government, through its letter No. TPC/1257/36339M dated 23 September 1957, directed that a new Development Plan be prepared in accordance with the provisions of the Bombay Town Planning Act, 1915. Following these instructions, the preparation of the Development Plan was undertaken. This plan was largely based on the 1952 Master Plan, with certain modifications. The work was completed in 1964, and the plan was sanctioned-after incorporating several amendments-by the State Government through Urban

Development and Public Health Department Notification No. TPS-1365-14, dated 7 July 1966, to come into effect from 15 August 1966.

2.5 Development Plan 1987

As per Section 38 of the Maharashtra Regional and Town Planning (MRTP) Act, 1966, a Development Plan (DP) must be revised once every ten years (currently twenty years) from the date it comes into force. Accordingly, the revision of Pune's DP, which had become due in 1976, was initiated when the State Government declared its intention to revise the plan on 15 March 1976 under Section 23 of the MRTP Act, 1966.

After completing the procedures prescribed under the Act, the draft revised DP was submitted to the State Government in 1982 under Section 30. Following scrutiny and modifications suggested by the Government, the first revised Development Plan of Pune was sanctioned through Government Notification, Urban Development Department No. TPS-1884/1377/Cr-220/84/(iii) UD-7, dated 5 January 1987.

2.6 Micro Plan

Several land parcels shown as agriculture in the Development Plan 1987, were recognized for urban development, over a period of time. Micro plans were sanctioned by State Government for these areas viz. Ghorpadi S.No. 46-54, 60-75, Hadapsar S.No. 106A, 77-82, 133-137, 152, 256, 269, 156-164, 207-211, 266, 267, Hingane S. No. 1-16, 20, 51, 53 vide notification TPS- 1899 / 606 / CR- 139/99/UD-13 Dtd 27/06/2000 and Ghorpadi S.No.36,37,38,40 vide notification TPS- 1804 / 1747 / CR - 108/06/UD-13 Dated 23/02/2007.

2.7 Regional Plan 1997

As discussed in the earlier chapter, the Regional Plan, 1997 is in force for the Pune Metropolitan Area (which includes newly merged 9 villages), till the Development Plan for the same comes into force after sanctioning. As per MRTP Act 1966 Section 27 it is emphasized that the provisions of the Regional Plan need to be considered while preparation of the Development Plan. Hence at this juncture it will be appropriate to look into all aspects of the Regional Plan including the objectives and proposals affecting the planning area.

2.7.1 Extent of Regional Plan 1997

Certain areas within the Pune Metropolitan Region (PMR) fall under the jurisdiction of other administrative bodies that function as planning authorities in accordance with the Maharashtra Regional and Town Planning (MRTP) Act, 1966. These include two municipal corporations-Pune Municipal Corporation (PMC) and Pimpri-Chinchwad Municipal Corporation (PCMC)-along with seven municipal councils, three cantonment boards, and one nagar panchayat. As these bodies have their own statutory plans, they are excluded from the Regional Plan. However, areas under the Maharashtra Industrial Development Corporation (MIDC), where Master Plans have been prepared for locations such as Chakan, Ranjangaon, Hinjawadi, and Talegaon, continue to form part of the Regional Plan.

2.7.2 Division of Pune Region in the RP 1997

According to the Regional Plan, 1997, the Pune Region is broadly divided into three sub-regions:

- i) Pune Metropolitan Area
- ii) Western Ghat Area
- iii) The remaining Eastern & Central part of the region

Pune Region is further divided into 8 Fringe Areas (Sector A-H) and 3 Growth Centers (Sector I, J, K) and 5 Peripheral Towns (Sector L, M, N-O-R, P, Q).

Prior to inclusion of nine villages in the limits of Pune Municipal Corporation, these villages were classified under different Sectors of sanctioned Regional Plan, 1997 for Pune District.

Pune Metropolitan Area: 8 sectors of the Pune Metropolitan Region in Regional Plan:

Table 2.2 Division of the Pune Metropolitan Region

Sector	Area	Area in Ha
A	Dehu, Talawade, Chikhali, Moshi, Dudulgaon	5029.35
B	Kiwale, Ravet, Mamurdi, Punavale, Tathawade, Wakad, Hinjewadi	4234.33
C	Baner, Balewadi, Mahalunge, Sus	2735.35
D	Bavdhan (Bk&Kh), Kothrud, Warje, Shivane, Kondhave- Dhavade	4375.35
E	Hingne (Kh), Wadgaon (Bk&Kh), Wadgaon-Dhayari, Narhe, Nanded, Kirkatwadi, Khadakwasla	4076.44
F	Ambegaon (Bk&Kh), Dhankawadi, Katraj, Kondhave (Kh& Bk)	5595.35
G	Undri, Pisoli, Mohammadwadi, Hadapsar, Phursungi, Manjari (Bk), Mundhwa, Uruli Devachi	9965.79
H	Wagholi, Wadgaon-sheri, Kharadi, Dighi, Kalas, Dhanori, Bopkhel, Charholi (Bk), Lohgaon	12597.59
Total		48609.55

(Source: Regional Planning Report)

Among the newly added nine villages, to PMC limit, Shivane and Shivane (Entire Uttam Nagar) come under D sector, Dhayari is in sector E. Ambegaon Kh and Ambegaon Bk are in sectors E and F respectively, while Mundhwa (Remaining Keshavnagar), Hadapsar (Entire Sadesataranali), Undri are in sector G and Lohgaon (Remaining) is part of sector H of Regional Plan, 1997 of Pune district.

While planning for these villages one must consider the strategies framed in the Regional Plan, 1997 to address problems peculiar to the region as briefed under:

Identification of Problems in PMR

- i) Higher growth in population
- ii) Lopsided industrial growth in western corridor
- iii) Shortfall of road width to cater the traffic
- iv) Unprecedented growth in private auto vehicles
- v) Deteriorated environmental quality

Planning Strategies for Pune Metropolitan Area

According to the problems identified, policies were framed in the Regional Plan and strategies were laid down to ensure proper implementation and to achieve the desired objectives. The strategies are as follows:

- i) **Population Distribution and Amenities:** The distribution of population and public amenities was based on the proposed settlement hierarchy and optimum travel distance norms. For the year 2011, the projected population was estimated as 21 lakh for PMC, 12 lakh for PCMC, and 2.65 lakh for the cantonments. The total PMR population was projected at 15.7 lakh, comprising 8 fringe village clusters (10.75 lakh), 4 growth centres (2.25 lakh), and 79 rural areas (2.7 lakh).
- ii) **Sectoral Division of Villages:** Analysis of existing land use, settlement patterns, and growth rates indicated that major growth occurred in 53 villages around PMC and PCMC. These villages were regrouped into 8 sectors (fringe areas) along arterial roads and highways, considering administrative boundaries and natural features.
- iii) **Residential Development:** Residential areas were planned at a gross residential density of 125-150 persons per hectare. To increase the availability of land for housing and to discourage illegal conversion of agricultural lands, most of the developable lands, excluding protected areas, were designated under residential zoning.

2.7.3 Impact of Regional Plan 1997

The Regional Plan of 1997 was formulated with the objective of promoting balanced regional development and ensuring the optimum use of available resources. A key aim was to reduce the urbanisation pressure on the Pune agglomeration, which includes PMC, PCMC, and the surrounding fringe villages. To achieve these objectives, specific policies and proposals were framed for the Pune Metropolitan Area.

Salient proposals of Regional Plan, 1997:

- i) Designation of Protected Zones, including forests, hill tops and hill slopes (slope >1:5), lake catchments, defence areas, and perennial agricultural lands.
- ii) Regional transport proposals such as the South-Eastern and North-Eastern bypasses (90m wide ring road), a railway line along the North-Eastern bypass, a Western Expressway (90m wide) from Somatane Phata to Shirwal, a ring road outside the corporation limits, quadrupling of the Lonavala-Pune railway, and the upgrading of the Pune-Daund railway.
- iii) Integration of six sectors into PMC and PCMC, and establishment of six new municipal councils for groups of fringe villages.

The implementation of RP 1997, along with subsequent modifications, provided some relief to the region by enabling guided, planned, and more equitable development. Several recommendations were accepted by the State Government—for instance, highly urbanised fringe villages were merged into the limits of PMC and PCMC.

In the absence of a sanctioned Development Plan for the newly merged 9 villages, the provisions of RP 1997, with modifications, continue to remain in force. Many of these have also been incorporated into the Draft DP, along with additional provisions for civic amenities, infrastructure, and micro-level planning.

2.7.4 Modifications in Regional Plan, 1997 after Sanctioning

The Regional Plan was sanctioned vide Government Notification No. TPS/1895/227/CR 26/15/UD-13 dated 25.11.1997 and came into force from 10.02.1998. As per the provisions of Section 20 of the MRTP Act, 1966, modifications to the sanctioned Regional Plan were carried out as and when required. These modifications primarily included conversion of zones and alterations to the road network to accommodate development needs. Vide Government Notification No. TPS/1812/844/CR 182/12/UD-13 dated 07.09.2013, a revised road network within 10 km outside the limits of PMC and PCMC was sanctioned.

2.8 The Development Plan, 2017

The Development Plan for the old Pune City area was revised for the second time under Section 38 of the MRTP Act, 1966, in 2007. The Revised DP was sanctioned vide Government Notification No. TPS-1815/209/CR-69/15/DP Pune/Sanction/UD-13 dated 05.01.2017 and 17.02.2018. The Development Control and Promotional Regulations, 2017 were also sanctioned vide Notification No. TPS-1815/209/CR-69/15/DP Pune/Sanction/UD-13 dated 05.01.2017.

2.9 Development plan for the Merged 23 Villages (1997 Merger)

On 11.09.1997, 38 villages were merged into the limits of Pune Municipal Corporation. In 2001, 15 villages were fully demerged and 5 villages were partly demerged. The remaining 23 villages covered an area of 100.06 sq. km. The draft DP for these 23 villages was submitted to the State Government on 31.12.2005. The State Government accorded sanction in stages vide notifications dated 17.05.2008, 18.09.2008, 02.03.2012, 04.04.2012, 30.08.2013, 13.02.2014, and 05.08.2015.

Additionally, Yewalewadi village was merged into PMC limits vide Notification No. PMC-3012/233/CR-375/UD-22 dated 21.12.2012. A draft DP for Yewalewadi was prepared by PMC and submitted to the State Government for sanction on 12.10.2018.

2.10 Development Plan for Recently merged 23 villages

Another 23 villages were merged into PMC limits vide Government Notification No. PMC-2020/C.R.322/UD-22 dated 30.06.2021. PMRDA, the Special Planning Authority for these areas, prepared and published the Draft Development Plan for the 23 newly merged villages along with the remaining villages in the Pune Metropolitan Region on 30.07.2021.

2.11 Implementation of earlier Development Plans for the city

Planners emphasize sustainable planning for a better future. However, the complexity of urban systems makes it challenging to evaluate the influence of development plans, as implementation often occurs in a piecemeal manner.

Learning from the poor implementation of earlier development plans—primarily due to paucity of funds—new tools were introduced under the DP sanctioned in 1997 for the erstwhile PMC limits. These tools included Accommodation Reservation and Transferable Development Rights (TDRs). While these mechanisms did provide momentum to DP implementation, the outcomes fell short of expectations. The following table presents an account of the overall implementation of earlier Development Plans in Pune City.

Table 2.3 The overall implementation of earlier Development Plans in Pune city

Development Plan (Yr of sanction)	No	Fully Developed	Partially Developed	% age of implementation
Old PMC Limit (2017)	791	148	36	23 %
23 villages included in 1997 (2008-15)	805	65	21	11 %

(Source: Implementation status as on 31.03.2024)

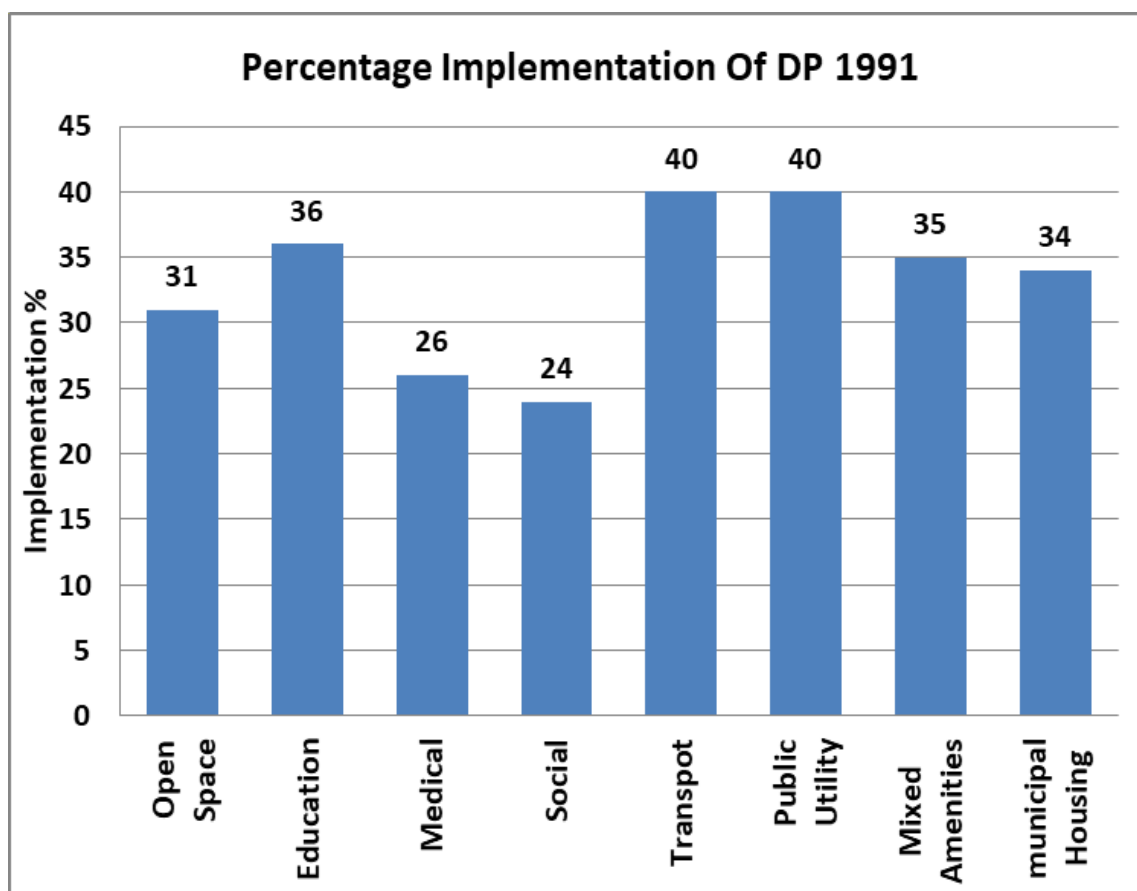
2.12 Implementation of earlier Development Plans for other cities

Data on the implementation of Development Plans (DPs) has been provided by the Brihanmumbai Municipal Corporation (BMC) for Greater Mumbai and the Navi Mumbai Municipal Corporation (NMMC) for Navi Mumbai. (Statistical data on the implementation of earlier DPs for other major cities in Maharashtra is not available.)

2.12.1 Municipal Corporation of Greater Mumbai

Summary of implementation of DP for Greater Bombay approved in 1991:

Figure 2.1 Percent implementation of DP 1991 in MCGM



(Source : BMC Development Plan Report for Development Plan 2034)

The assessment of the implementation status of reservations under DP 1991 indicates that only 25% to 40% of reservations were implemented in Greater Mumbai. The highest implementation was observed in Transport and Public Utility proposals, while the lowest was in Social Amenities. Most reservations were executed through implementation tools such as Accommodation Reservation and Transferable Development Rights (TDR), as noted in the report.

2.12.1. Navi Mumbai Municipal corporation (NMMC)

The State Government appointed CIDCO as the New Town Development Authority (NTDA) in 1971 for preparing the Development Plan of Navi Mumbai, covering 95 villages. CIDCO prepared a comprehensive DP for the area, delineating land use zones such as Residential, Commercial, Industrial, Recreational, Public and Semi-Public, Public Utility, and Traffic and Transportation.

In 1992, 44 villages were incorporated into NMMC, of which 29 revenue villages formed part of CIDCO's sanctioned DP. Subsequently, NMMC prepared a Draft DP for the same area for the period 2018-2038, which was approved by the State Government in **2022**. The DP report provides a summary of the implementation status of the earlier Development Plan prepared by CIDCO, as outlined below.

Table 2.4 Implementation of earlier Development Plan (By CIDCO) for NMMC area

Sr. No.	Category of Reservation	Total Reservation	Physically Developed	Not developed	% Of Developed Reservations
1	Recreational	605	231	374	38
2	PSP	279	47	232	17
3	Public Utility	217	40	177	18
4	Traffic and Transportation	112	46	66	41
5	Commercial	328	46	282	14
6	Residential	2	1	1	50
	Total	1543	411	1132	27

The implementation status of reservations of the earlier Development Plan reveals that 27% of the reservations have been implemented in the NMMC area, with the maximum implementation observed in Residential Reservations, followed by Traffic and Transport proposals and Recreational Reservations, while the minimum implementation is recorded in Commercial Reservations. Public Transport Optimization.

2.13 Hurdles in Implementation of Development Plans

From the statistics, it is evident that both the sanctioned Development Plans for Pune City- i.e., for the old PMC limits as well as for the 23 merged villages- have been only partially implemented. The major reasons attributed to the non-implementation of Development Plans can be summarized as follows:

- Rising land values in urban areas
- Paucity of funds
- Limited manpower with the ULBs
- Lack of Public Participation
- Constraints in the use of other modes of implementation
- Unauthorized Development and encroachment on Government Lands.

To address these hurdles and ensure timely and effective implementation of Development Plans, various tools and mechanisms have been devised over time. Appropriate provisions have been incorporated in the relevant Acts and Regulations to provide a legal framework for these implementation modes. These avenues for implementation are elaborated in detail in the chapter on “Implementation of Development Plan” in this report.

CHAPTER 3 : COLLECTION AND ANALYSIS OF DATA

Introduction

Data collection forms a critical component of the planning process. The information represented in the Existing Land Use map and Base map provides the foundation for preparing the Proposed Land Use map. Analysis of the collected data generates insights into the characteristics of the planning area, its growth potential, development trends, population, and infrastructure requirements. Broadly, data can be categorized into primary and secondary sources depending on the method of collection and relevance.

3.1 Collection of Primary Data

Primary data refers to information gathered first-hand by the investigator through surveys and direct observations. In planning, it generally includes details of land use, traffic and transportation, housing, and socio-economic and demographic features. For the Development Plan, primary data for the nine villages was collected through demographic, socio-economic and housing surveys, traffic and transportation surveys, water body and groundwater studies, and through inputs received from stakeholders, public meetings, and concerned departments.

3.1.1 Total Station Survey

Given the congested nature of urban pockets within the nine villages, a detailed Electronic Total Station (ETS) survey was conducted during 2018–19. This survey mapped existing features such as roads, power lines, towers, property boundaries, compound walls, fences, plots, public and semi-public buildings, commercial and industrial areas, water bodies, and significant vegetation. The findings highlighted challenges such as narrow lanes, high density, inadequate amenities, lack of marginal open spaces, and violations of permissible FSI, all of which pose constraints for providing essential civic services.

3.1.2 Attribute Survey

In addition to the ETS data, a separate attribute survey was carried out to record the existing land use of the planning area. This included detailed classification of structures and land parcels into residential, commercial, industrial, public and semi-public, government, and public utility uses. Data was collected in a standardized format and comprehensive information on educational, healthcare, and industrial establishments was documented in separate formats.

3.1.3 Demographic, socio- economic and housing Survey

Socio-economic and demographic characteristics, population and status of housing, structures, residential & non-residential density, etc. help in projecting future population and requirements of infrastructure developments pertinent to the planning area. Census of India conducted in 2011 covered newly merged nine villages as a part of the rural region of Pune district. However the population data after that is not available. Hence Gokhale Institute of Politics and Economics, Pune (GIPE) was appointed to carry out Demographic, Socio-economic and Housing Survey in the planning area. ‘Probability Proportional to Size

(PPS)' technique was used for conducting a sample survey in the planning area, with sample size approximately 10% of total households in nine villages i.e. around 3,484.

i) Demographic Survey

A demographic sample survey was conducted in nine villages to collect data on population size, household structure, density, social subgroups, and key demographic characteristics such as age distribution, dependency ratio, sex ratio, marital status, occupation, and migration patterns. Based on this information and subsequent analysis, the Gokhale Institute of Politics and Economics (GIPE) submitted a report that included population projections, projected age and sex distribution, and other parameters essential for formulating Development Plan proposals.

ii) Socio-Economic Survey

For the socio-economic assessment of the newly merged nine villages, data was obtained through household surveys, physical observations in the planning area, and structured public meetings with stakeholders. The information collected captured socio-economic conditions, demographic characteristics, as well as residents' perceptions of development, aspirations, and preferences. The GIPE report on this survey provided suggestive development models, priority focus areas for each village, and recommendations contextualized to their scale and extent.

iii) Housing Survey

The housing survey collected detailed information on the condition of existing housing stock, availability of physical infrastructure, housing typologies, size, tenure, amenities, and facilities. It also included data on fire safety, housing market trends, and affordability. Based on these findings, the report offered recommendations such as strategies aligned with central and state housing policies, approaches for affordable housing provision, retrofitting measures, capital improvement programs, and policy suggestions including enhanced FSI norms for EWS and LIG housing.

3.1.4 Survey of Water Bodies in planning area

Water bodies in urban areas serve multiple functions such as water supply, irrigation, landscaping, fishing, eco-tourism, and micro-climate regulation. The nine newly merged villages contain several nallas, wells, lakes, and percolation tanks. Major rivers in the area include the Mutha and Mula-Mutha, flowing near Shivane and Mundhwa–Keshav Nagar respectively, while the Indrayani River marks the northeastern boundary of Lohgaon.

The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued an advisory on the conservation and restoration of water bodies in urban areas, while the National Plan for Conservation of Aquatic Ecosystems (NPCA) provides guidelines and action plans for lake conservation. In line with these directives, PriMove Infrastructure Development Consultants Pvt. Ltd. was appointed to prepare a Storm Water Master Plan covering the planning area. The study involved collecting data on natural streams, their courses, outfalls, carrying capacity, flood-prone locations, and encroachments through

detailed topographical surveys using Total Station. Village maps, regional planning maps, toposheets, and historical rainfall records were also analyzed. The data was used to develop Intensity-Duration-Frequency (IDF) curves, assess runoff, and evaluate possibilities for increasing stream carrying capacities. Recommendations included design specifications for streams, measures to prevent stagnation, proposals for nalla improvements, culvert designs, and block costing of stormwater management components.

Additionally, the earlier ETS survey recorded detailed information on water bodies such as lakes, wells, canals, streams, and percolation tanks, including their location, features, and extent. This database provided the foundation for formulating conservation and restoration proposals for water bodies in the Development Plan.

3.1.5 Ground Water

Pune's hydrogeology and its expanding urban footprint highlight the urgent need for focused urban water policies. Over-extraction and contamination have significantly increased the vulnerability of groundwater resources.

The Pune Municipal Corporation (PMC) has initiated groundwater governance measures aimed at ensuring judicious use, revival, and replenishment of aquifers. ACWADAM, an NGO specializing in groundwater research and conservation, working on behalf of the Pune Groundwater Cell (PGWC) in PMC, undertook geological mapping and aquifer characterization based on available data. Following surveys in the nine newly merged villages, Dhayari Gaon-Tale, Harantale in Lohgaon, and Shivane Uttamnagar (APMC) were identified for the Shallow Aquifer Recharge Pilot Project under AMRUT 2.0.

3.1.6 Traffic and Transportation

The latest Comprehensive Mobility Plan (CMP), prepared in 2018 for a 20-year horizon, covers the Pune Metropolitan Region (PMR) spread across 2,172 sq. km., including PMC, PCMC, and three Cantonment Boards. For the preparation of the Development Plan for the nine newly merged villages, data relevant to these areas was referred to from CMP 2018. Its recommendations regarding the mass transport network, ring road, transit-oriented development (TOD), mobility corridors, road connectivity, non-motorized transport (NMT), transport hubs, pedestrian priority measures, road widening, flyovers, underpasses, bus depots and terminals, parking, and related policies have been duly considered.

3.1.7 Public Participation Meetings and Interaction with Stakeholders

Pre-scheduled public meetings were organized by the Gokhale Institute of Politics and Economics in each of the nine villages to understand residents' perceptions about existing amenities, along with their aspirations and expectations from the proposed Development Plan. These consultations also helped identify and prioritize local needs. In addition, meetings were held with relevant government departments and agencies operating in the planning area to understand their requirements regarding infrastructure, land, and facilities.

3.2 Collection of Secondary Data

In addition to primary surveys, data from government records, earlier surveys, sanctioned development and regional plans, guidelines, manuals, research studies, and reports were reviewed for preparing the Existing Land Use (ELU) map. Secondary data, being information originally collected for another purpose but later repurposed, provided valuable inputs. For the nine newly merged villages, important secondary sources included demographic records, infrastructure inventories, previous planning documents, and technical studies relevant to the area.

3.2.1 Administrative Boundaries

Boundaries of nine villages, survey numbers, TPS, forests, ITPs, sanctioned DPs, Gaothan/Wadis, restricted zones (bomb dumps, defence, airports), and red/blue lines of rivers were referred.

3.2.2 Census

Earlier census data published by the Registrar General and Census Commissioner, India, under the Ministry of Home Affairs, Government of India, for Pune city were referred. The *“Report on the Population Projections for India and States 2011-2036”* by the Technical Group on Population Projections, under the National Commission on Population, Ministry of Health and Family Welfare, was also considered.

3.2.3 Hill Top- Hill Slope

The sanctioned Regional Plan was referred for the extent of the Hill Top Hill Slope (HTHS) zone. Slope analysis was carried out based on contour surveys to identify land with slopes steeper than 1:5, apart from the HTHS areas shown in the Regional Plan.

3.2.4 Forest

Information regarding revenue survey numbers under declared forests was obtained from the Office of the Deputy Conservator of Forests. The area shown as forest in the sanctioned Regional Plan was also referred.

3.2.5 Irrigation

The planning area includes Jambhulwadi Lake, percolation tanks at Undri, and canals of Khadakwasla Dam passing through Hadapsar village, which fall under the jurisdiction of the Irrigation Department. Details of these irrigation projects, along with prohibited zones (Blue Line) and restricted zones (Red Line) of the Mutha, Mula–Mutha, and Indrayani rivers, were obtained from the department.

3.2.6 Government Assets

Details of lands and buildings owned by central, state, and semi-government authorities, including revenue numbers, area, and present status, were collected from the concerned departments and revenue records.

3.2.7 PCMC and PMRDA Development Plan

The Development Plan of PCMC and the Draft Development Plan and report for the Pune Metropolitan Region prepared by PMRDA were referred for information regarding common planning boundaries, adjoining areas, and proposed road connectivity.

3.2.8 Notified Highways and Roads

Details of National Highways, State Highways, Major District Roads, and the Ring Road relevant to the nine villages were obtained from NHAI, PWD, Government of Maharashtra, and PMRDA.

3.2.9 Railway

The Pune-Solapur rail line passing through Hadapsar was verified from available revenue maps.

3.2.10 Metro

The planning area has four proposed metro-rail routes: Alandi-Chakan-Wagholi along the proposed 65 m Ring Road, Hinjewadi–Wagholi, Vanaz-Ramwadi–Wagholi, and Swargate-Hadapsar-Fursungi. PMRDA and Maha-Metro are the respective planning and development authorities.

The Comprehensive Mobility Plan, 2018 for the Pune Metropolitan Region was referred for information. At present, the following routes are being prioritized under Maha-Metro: (1) Ramwadi–Wagholi, (2) Hadapsar–Kharadi, and (3) Swargate–Hadapsar

3.2.11 Bullet Train

The proposed Mumbai–Hyderabad High-Speed Rail Corridor (Bullet Train) passes through Lohagaon in the planning area. Most of the alignment overlaps with the 65 m Ring Road being developed by PMRDA.

3.2.12 Pune- Nashik Semi High-Speed Railway

The proposed 235 km long Pune–Nashik Semi High-Speed Double Broad-Gauge Rail line passes through the planning area. This project, to be developed by the Maharashtra Rail Infrastructure Development Corporation Ltd. (a joint venture of the Government of Maharashtra and the Ministry of Railways), aims to cover the Pune–Nashik distance in 1 hour 45 minutes.

3.2.13 Infrastructural Projects and Services of PMC

The infrastructural projects undertaken by PMC in the nine villages include roads, water supply, and sanitation projects, some of which are funded under JICA, AMRUT, Smart City, and the 15th Finance Commission. Detailed Project Reports for these projects were referred for data required during planning.

i) Water Supply

Following dams cater to the water demand of Pune City, out of the total cumulative capacity of the dams, 31.72 TMC (Thousand Million Cubic Feet) of water is usable

Table 3.1 Dams and Their Capacities

Sr.No.	Name	Total Capacity
1.	Khadakwasla dam	3.03 TMC
2.	Temghar dam	3.72 TMC
3.	Panshet dam	10.96 TMC
4.	Varasgaon dam	13.25 TMC
5.	Bhama Askhed	8 TMC
Total		38.96 TMC

(Source: Environment Status Report 2021-2022 PMC)

The water from these dams is treated at various treatment plants, as listed below.

Table 3.2 Water Treatment Plants in Pune City

Sr. No.	Water treatment Plant	Location	Capacity of plant (M.L.D.)	Method of Processing
1.	Parvati	Sinhagad Road	450	Conventional
			500	Unconventional
2.	Pune Cantonment	Pune Cantonment Area	100	Conventional
3.	Wadgaon	Sinhagad Road	250	Conventional
4.	Warje	Warje	382	Conventional
5.	Old Holkar Bridge	Holkar Bridge	20	Conventional
6.	New Holkar Bridge	Holkar Bridge	40	Conventional
7.	Wagholi	Wagholi	26	-
Total			1768	

ii) Sewage

Maharashtra Industrial Policy, and proposed logistics hubs near Kedgaon and Shendi are expected to boost freight activity. The city is also being considered for a new SEZ (Special Economic Zone) proposal under the Make in India mission, which will further accelerate industrialization and employment opportunities.

Table 3.3 Sewage Treatment Plants in Pune with Their Capacity

Sr.No.	Sewage Treatment Plant	Total Capacity (MLD)
1.	Bhairoba Sewage Treatment Plant	130
2.	Erandwane Sewage Treatment Plant	50
3.	Tanajiwadi Sewage Treatment Plant	17
4.	Bopodi Sewage Treatment Plant	18
5.	Mundhwa Sewage Treatment Plant	45
6.	Vithalwadi Sewage Treatment Plant	32
7.	Naidu (New) Sewage Treatment Plant	115
8.	Baner Sewage Treatment Plant	30
9.	Kharadi Sewage Treatment Plant	40
10.	Naidu (Old) Sewage Treatment Plant	90
	Total	567

For augmenting the present sewage treatment capacity and to prevent the discharge of untreated sewage into the rivers of the city, the Central Government has approved funds of ₹990.26 crore under the *National River Conservation Scheme*. The sanctioned works include the construction of sewage treatment plants at 11 locations, development of GIS and SCADA systems, along with other related improvements. The details of these 11 sewage treatment plants are provided in the following table.

Table 3.4 Sewage treatment plants under National River Conservation Scheme

Sr. No	Sewage treatment plant in the city	Waste water treatment plant Capacity (MLD)	Sr. No	Sewage treatment plant in the city	Waste water treatment plant Capacity (MLD)
1.	Botanical Garden	10	7.	Tanaji Wadi	15
2.	Baner	25	8.	Naidu	127
3.	Warje	28	9.	Dhanori	33
4.	Wadgaon	26	10.	Bhairoba	75
5.	Mundhwa	20	11.	Fish Seed Center	7
6.	Kharadi	30			
	Total Capacity			396 (MLD)	

It also includes the laying of 450 mm to 1600 mm diameter sewers to connect open drains to the nearest sewage treatment plant, along with the development of large-diameter trunk lines in nine villages as per the Transmission Master Plan. The city area is divided into

various Drainage Districts (Zones) based on topography. Pune Municipal Corporation will be the first corporation in Maharashtra to implement gamma radiation treatment on sludge from sewage treatment plants, using 500 KCI COBALT-60. For this purpose, the radioactive element will be provided by Bhabha Atomic Research Centre free of cost for three years. Through this radiation process, harmful pathogens (bacteria) in the sludge are completely destroyed, while beneficial micro-organisms are retained to enhance soil fertility. The treated sludge is proposed to be utilized as an organic fertilizer.

iii) Solid Waste Management

A solid waste processing site with a capacity of 180 MTPD dry waste processing, is located in villages Uruli Devachi and Fursungi, where a major part of solid waste collected from the Pune City area is processed and disposed of.

Table 3.5 Details of Uruli Devachi and Fursungi Garbage Processing Plant

Total Area	163 Acres (Land was identified Collector of Pune district in 1989)
Area used for waste processing	45 Acre
Area under Actual Waste / Legacy Waste	93 Acre
Area under buffer zone and roads	18 Acre
Operational Capacity of the Dry waste Processing Plant	180 MTPD
Remediation Technique	Scientific Capping & Bio- Mining as per Rule MSW-2016

(Source: Solid Waste Management Department, PMC)

Apart from this major facility, there are some decentralized garbage processing plants located all over the city.

3.2.14 Infrastructural Projects and Services of other Govt. Establishments

Information regarding infrastructural projects and services such as Water Treatment Plants, ESRs and water supply systems, power transmission and distribution, and high-pressure petroleum product pipelines was obtained from the respective authorities, viz. Maharashtra Jeevan Pradhikaran, MSETCL, MSEDCL, and HPCL.

3.2.15 Health and Education facilities

Information regarding existing government facilities such as schools, dispensaries, and hospitals was collected from the concerned authorities.

3.2.16 Mining/Quarry

Details regarding the location, area, survey numbers, and quarrying period were obtained from the District Mining Officer, Collectorate, Pune.

3.2.17 Environmental Data

The Environment Status Report 2022–2023 published by PMC was referred to for data regarding the status of the environment, ecosystems, climatological parameters, biodiversity, and services provided in the city.

3.2.18 Earlier Sanctioned Layouts

Details regarding earlier Integrated Township Projects, sanctioned layouts, and building permissions on individual plots were collected from the concerned competent authorities.

3.2.19 Restricted Zones

i) Airport Vicinity:

As per the powers conferred by section 3 and 7 of the Works of Defense Act 1903, Central Govt. has imposed restrictions upon use of the land in the vicinity of Indian Air Force Stations and installations. Restrictions are imposed on the height of the buildings in the area in the vicinity of Air Force station Lohgaon- Pune and NDA Airport at Shivane in the planning area, as elaborated in CCZM published by Airports Authority of India, on behalf of Ministry of Civil Aviation.

ii) Bomb dump

Restricted area is earmarked for 900 meters around the boundary of the bomb dump area at Lohgaon, where no building or structure shall be constructed, erected, or created, and no tree shall be planted.

iii) Flood Lines

Flood lines were earmarked by Irrigation Department, Govt. of Maharashtra, along the rivers as instructed through Govt. circular dated 02.09.1989 in view of regulating construction inside the flood lines to avoid dangers posed by flooding in future. The area between river bank and blue flood line is marked as a Prohibited Zone while area between blue flood line and red flood line is marked as a Restrictive Zone along the Rivers Mutha, Mula-Mutha and Indrayani in the planning area. The types of construction permitted in the prohibited and restrictive zones are further elaborated in UDCPR 2020.

3.2.20 Acts, Codes, Guidelines, Directives, Policies

3.3.20.1 URDPFI Guidelines, 2015: For promoting balanced and orderly regional and urban planning and development, “Urban and Regional Development Plans Formulation and Implementation Guidelines” were published by the Ministry of Urban Development; Govt. of India in 2015. It elaborates on all aspects of urban planning and development such as plan formulation, approach, sustainability, simplified planning techniques, infrastructure planning, resource mobilization for plan implementation and provisions of development

control and promotion regulations. The proposed development plan for nine villages has drawn guidance from these guidelines for planning and development purpose.

3.3.20.2 NUHM Guidelines: NUHM Guidelines for health facilities in urban areas such as urban public center, AYUSH center, Dispensary, UFWC, etc. were referred for assessing the needs of healthcare in the planning area.

3.3.20.3 Guidelines for Fire Services: Provisions in MMC act, 1949, NBC 2016, Maharashtra Fire Prevention Life Safety Act, 2006 and 2009 for fire stations, also Guidelines issued by Govt. of Maharashtra 29.09.1978 were referred to.

3.3.20.4 Solid Waste Management Act: Solid Waste Disposal Act 1965 (amended on 15.11.2021) and Solid Waste Management Rules 2016, lay down an environmentally sound manner of waste collection, storage, segregation, transportation, processing and disposal of Municipal Solid Waste, to minimize adverse impact on the environment. Also, the Central Pollution Control Board has issued guidelines on the provision of buffer zone around waste processing and disposal facilities in April 2017. Maharashtra Pollution Control Board emphasizes on adhering to provisions of SWM Rule 2016 in this regard. At present, Pune city generates around 2,000 MT of solid waste per day (approximately 500 gm per capita per day), while India as a whole generates around 62 million MT annually.

3.3.20.5 Bureau of Indian Standards (BIS): The erstwhile Indian Standards Institution (ISI) was established in 1947 (now Bureau of Indian Standards) with the objective of harmonious development of standardization activity in India. Under the Bureau of Indian Standards Act, 2016, Bureau establishes Indian Standards in relation to any article or process and amends, revises or cancels the standards so established as may be necessary. Standards are being followed.

3.3.20.6 NUTP, 2006: The National Urban Transport Policy (NUTP) was formulated by the Ministry of Urban Development in 2006. The objective of the National Urban Transport Policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, and recreation; and to “Bring about equitable use of road space with people and not vehicles as the focus”.

3.3.20.7 Indian Road Congress Guidelines: The Indian Road Congress (I.R.C.) was established by the Central Government in 1934 as per the recommendations of the Jayakar Committee, to provide a forum for regular pooling of experience and ideas on all matters affecting the construction and maintenance of roads in India. The I.R.C. works in close collaboration with the Ministry of Road Transport & Highways (MORT&H) and publishes journals, standard specifications and guidelines on various aspects of highway engineering.

3.3.20.8 UTTIPEC (Unified Traffic and Transportation Infrastructure Planning & Engineering Center) guidelines: The Unified Traffic and Transportation Infrastructure (Planning & Engineering) Center was set up in 2008 by Delhi Development Authority with a view to avoid transport planning pitfalls in the National Capital Territory of Delhi and to enhance mobility, reduce congestion and to promote traffic safety by adopting standard transport planning practices. It also enabled capacity building, enforcement measures, road safety audits, traffic engineering practices and improved traffic management by efficient

lane capacity and work zone management, utilities coordination and developing traffic culture. Due reference is taken of these provisions.

3.3.20.9 Motor Vehicles Act; 1988: The Motor Vehicles Act, 1988 is an act to consolidate and amend the law relating to motor vehicles. It regulates almost all aspects of road transport vehicles. Along with other matters it also provides detailed guidelines about traffic regulations.

3.3.20.10 Disabilities Act: The 'Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995', is a significant step in the direction to ensure equal opportunities for people with disabilities and their full participation in nation building. Along with other matters the Act also provides for creation of a barrier-free environment with improved accessibility and mobility for persons with disability.

3.3.20.11 Guidelines and Toolkits for Urban Transport Developments: The Guidelines and Toolkits for Urban Transport Development were prepared by a Technical Assistance on Urban Transport Strategy funded by the Asian Development Bank. These documents are used by decision makers and practitioners in states and municipal governments for urban transport development in medium-sized cities in India. The Guidelines and Toolkits focus on the planning process and policy options and serve more as checklists of available measures and the tasks required to solve urban transport problems, rather than providing technical guidelines for the development of detailed transport measures.

3.3.20.12 National Policy for Street Vending, 2009: National Policy For Street Vending, 2009, National Building Code, MRTP Act and The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act 2014, provide for protecting rights of urban street vendors and regulating street vending activities and expect an independent policy i.e., 'Hawker's Policy' for street vendors to be formulated at city level.

3.3.20.13 Hawker's Policy: The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act 2014, provides for protecting the rights of urban street vendors and regulating street vending activities. An independent policy i.e., 'Hawker's Policy' for street vendors in light of the Street Vendors Act, 2014 and the provisions of National Policy for Street Vending, 2009, National Building Code, and MRTP Act, was formulated with an objective of appropriate rehabilitation of street vendors along roads, small platform markets on vacant lands along the roads by making systematic plans. Pune Municipal Corporation has also set up a town vending committee under Section 22.

3.3.20.14 Study of Traffic and Transportation Policies and Strategies in Urban areas in India 2008: It proposes Street typology Design recommendations on layout, surface, level, cycle tracks, carriage way, parking, footpath, bus-stops and also Traffic calming measures, safety measures, street furniture, Multi Utility Zone (MUZ), Public Toilets etc.

In compliance with the provisions of aforementioned acts, guidelines, recommendations efforts were made to improve traffic and transportation conditions in Pune city.

3.3.20.15 Urban Street Design Guidelines 2016 (USDG): USDG Pune were formulated for specifying design guidelines with an aim of transforming streets into those prioritizing

for people and not for vehicles. The guidelines are in line with Indian Road Congress Guidelines, Motor Vehicles Act 1988, Disabilities Act, Guidelines and Toolkits for Urban Transport Developments, NUTP 2006, 12th Five Year Plan, National Mission on Substantial Habitats, UTTIPEC Guidelines, Study of Traffic and Transportation Policies and Strategies in Urban areas in India 2008. It proposes Street typology, Design recommendations on layout, surface, level, cycle tracks, carriage way, parking, footpath, bus-stops and also Traffic calming measures, safety measures, street furniture, Multi Utility Zone (MUZ), Public Toilets etc.

3.3.20.16 Parking Policy: The National Urban Transport Policy for India published by the Ministry of Urban Development; Govt. of India in 2006, expected Parking Policy to be framed at city level. PMC has worked out a Parking Policy on the basis of CMP of Pune, 2008 with an objective of achieving 80% of motorized trips by public transport by the year 2031. It also aims at achieving at least 50% reduction in total Vehicle Kilometer Traveled (VKT) by 2031 by creating an effective Parking Management System, transforming at least 10% of on-street parking spaces to public open spaces or NMT infrastructure by rationalization of parking spaces. The city is subdivided into multiple parking districts and formulated Off-street parking structures and On-street parking management. The legal provisions from MMC Act;1949, The Motor Vehicle Act 1988, The Maharashtra Motor Vehicle Act;1989 were referred to while framing the Public Parking Policy for Pune Municipal Corporation in 2018. PMC has approved parking policy vide General Body Resolution No. 1092, dated 23.03.2018, as per provision of MMC act 1949 section 243, whereby parking space per vehicle, parking charges along with period of parking, etc. are defined.

3.3.20.17 Comprehensive Bicycle Plan 2017 (CBP): Pune City boasts the status of first city in the country to have a Comprehensive Bicycle Plan. CBP with 824 km of cycle tracks and parking at 806 locations with a capacity of 14,000 bicycles was sanctioned by PMC on 14.12.2017. The plan is expected to be compatible with the guidelines of the Sustainable Habitat Mission. The cycle tracks are introduced on city roads in the form of rejuvenated existing cycle tracks, new dedicated cycle tracks along the roads, earmarked painted tracks on roads, Greenway Cycle Tracks and Composite Cycle Tracks with pedestrian ways. CBP is being extended progressively to include streets in newly merged areas in the PMC limit over the time. The Central Govt. directed the State Govt. to notify under the State T&CP Act for inclusion of CBP as a part of the Master Plan for the respective Local Planning area. CBP is being incorporated in Development Plans for the city with cycle tracks and parking lots. It is expected that the proposals of CBP will help in creation of appropriate institutional structures and directing investments for cycling improvement which will in turn support the policy of NMT and use of public transport.

3.3.20.18 Pedestrian Policy: For providing safe, adequate, usable, consistent and high-quality pedestrian infrastructure with equitable allocation of road space, “Pedestrian Policy” was formulated for Pune City. It is in conformation with relevant IRC guidelines, the STAC (Standing Technical Advisory Committee on Roads for PMC) report, Street Design Guidelines for Pune, Design of Urban Roads- Code of Practice, MoUD. Other policy guidelines such as National Urban Transport Policy, Standards for National Mission for Sustainable Habitats and CMP were also referred. The smart pedestrian streets were conceptualized having demarcated zones for vehicles, bicycles and pedestrians, commercial activities to ensure sustainable mobile ecosystem. Elaborate provisions were

made for specifications of Footpaths, At Grade Pedestrian Road crossings, Foot over Bridge and Pedestrian Subways in Walk Smart (Policy for Pedestrian Safety and Comfort, Pune city sanctioned vide GB resolution no.543, dated 23.08.2016).

3.3.20.19 National Mission on Substantial Habitats:- The National Mission for Sustainable Habitat which is a component of the National Action Plan for Climate Change, broadly covers the following aspects: Extension of the Energy Conservation Building Code - which addresses the design of new and large commercial buildings to optimize their energy demand; Better urban planning and modal shift to public transport - make long term transport plans to facilitate the growth of medium and small cities in such a way that ensures efficient and convenient public transport. The National Mission will include a major R&D programme, focusing on biochemical conversion, waste water use, sewage utilization and recycling options wherever possible.

3.3.20.20 Eco Housing: An Eco-house is an environmentally low-impact house which has low carbon footprint and low energy needs. The Eco-homes are evaluated in multiple ways pertaining to sustainability needs such as water conservation, recycling, reusing of materials, less pollution, energy conservation, etc. Agencies like GRIHA, IGBC, and LEED, empanelled by State/Central Govt., give ratings to the green buildings / Eco-homes. Provision has been made in UDCPR 2020 (clause 7.10) for incentive FSI ranging between 3-7% for green buildings based upon the ratings given by GRIHA/IGBC/LEED to the buildings.

- i) LEED (Leadership in Energy and Environmental Design):** LEED, a third-party green building certification programme for design, construction and operation of green buildings gives rating like Silver, Gold, Platinum in various categories like Building design and construction, Interior design and construction, Building operations and maintenance, Neighborhood development and also for cities and communities. The ratings are given over a scale of 110 points after assessing parameters (with different weightage) like integrative process, location & transportation, sustainable sites, water efficiency, energy & atmosphere, materials & resources, Indoor environment quality, innovation and regional priority.
- ii) GRIHA (Green Rating for Integrated Habitat Assessment):** GRIHA is a rating tool for green building evaluating its environmental performance over its entire life cycle. The ratings are given over a scale of 105 points after assessing parameters like sustainable site plan, construction management, energy optimization, occupant comfort, water management, solid waste management, sustainable building materials, life cycle costing, socio-economic strategies, performance metering & monitoring and innovation.
- iii) IGBC (Indian Green Building Council):** IGBC was formed by Confederation of Indian Industry (CII), as first rating programme developed in India exclusively for residential sector, in 2001. The council offers a wide array of services which include developing green buildings in conserving natural resources, new green building rating programs, certification services and green building training programs. It gives ratings in various categories: new buildings, existing buildings, homes, schools, factory buildings, townships, SEZs, landscapes, Mass Rapid Transit Systems. The ratings are given over a scale of 100 points after assessing parameters (with different weightage) like sustainable architecture & design, site selection & planning, water conservation, energy efficiency covering metering & monitoring,

building materials & resources, indoor environmental quality and innovation & development.

3.3.20.21 Disaster Management: The Ministry of Law and Justice, Govt. of India, has enacted the Disaster Management Act, 2005, which provides for institutional structures, minimum standards of relief measures, penalties for obstruction of authorities, offences against provisions of the Act, and failures to perform mandated duties, and also for various Disaster Management Authorities and their powers and functions, the National Disaster Response Force, and the National Disaster Mitigation Fund. The Pune Municipal Corporation has a dedicated Disaster Management Cell. A Disaster Management Plan for Pune was framed to make it a 'Disaster Resilient City' in terms of prevention and to prepare a strategy of preparedness and mitigation, to minimize losses to human life and property.

3.3 Analysis of Data

The inferences drawn from a detailed analysis of the compiled primary and secondary data provide an understanding of the existing conditions, emerging trends, and specific requirements of the planning area. This process assists in identifying, classifying, and correlating the collected information to derive meaningful insights, conclusions, policy directions, and design guidelines.

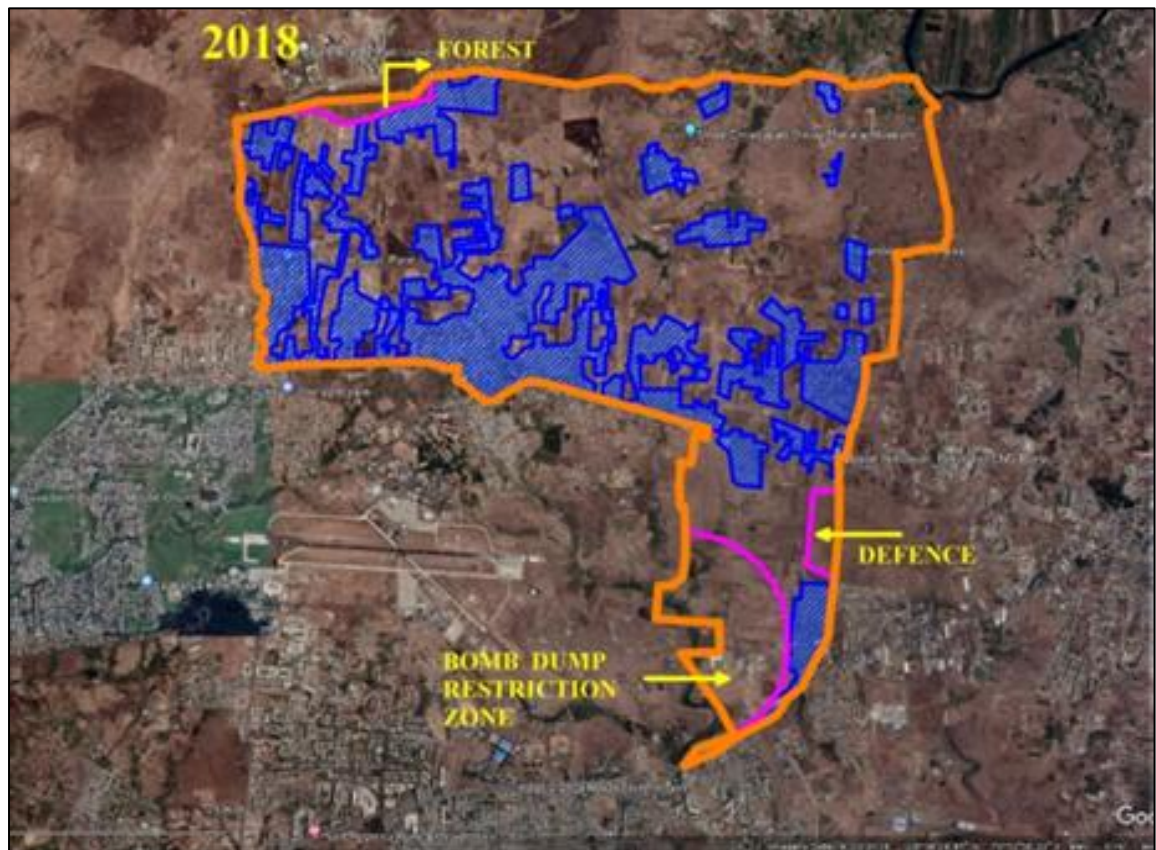
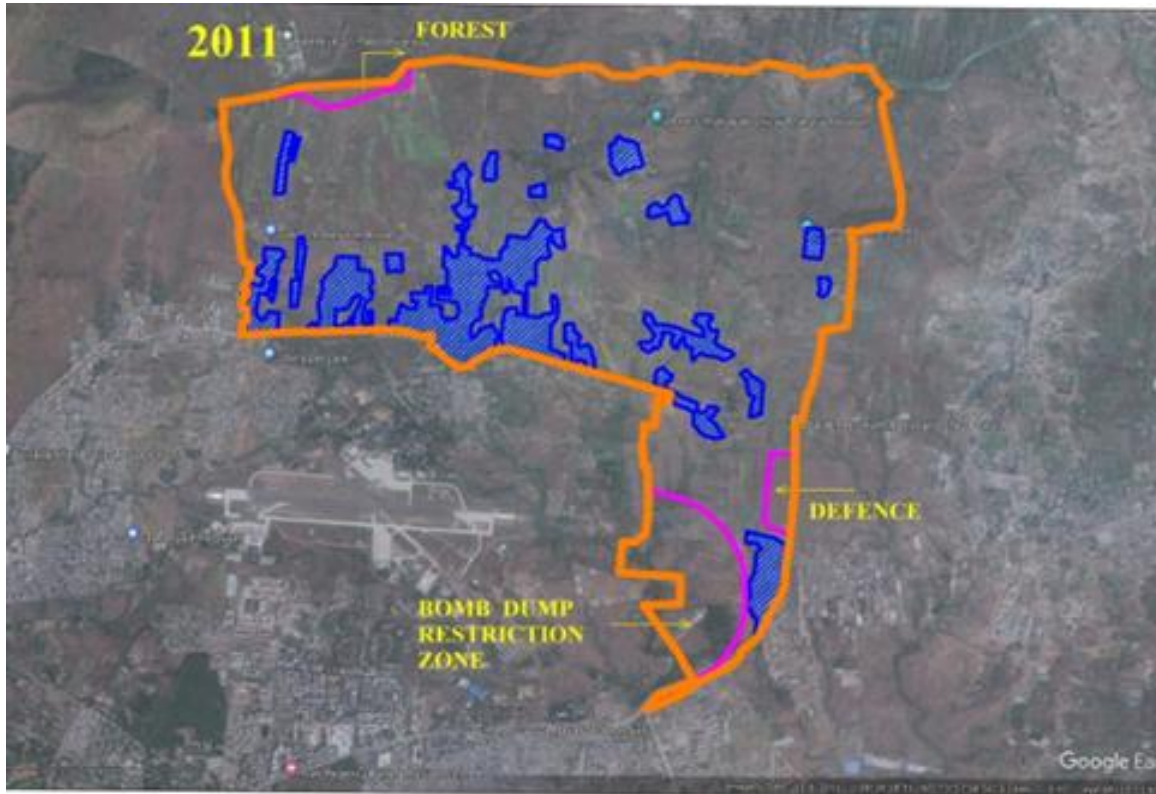
The analysis of both primary and secondary data reveals that each of the nine newly merged villages possesses distinct characteristics. These are reflected through growth patterns, development potential, topography, air quality, physical features, land use distribution across residential, commercial, industrial, and agricultural categories, presence of major establishments, availability of infrastructure and amenities, as well as socio-economic and demographic aspects such as household size, access to safe drinking water, and sanitation facilities. Collectively, these parameters define the quality of life of the residents and highlight the need for context-specific planning.

A comprehensive examination of the data was undertaken to draw inferences that form the basis of the Development Plan for the nine villages.

3.3.1 Growth of the Villages in Last 2 Decades

Being part of the urban fringe, all nine villages have witnessed rapid growth over the past two decades. This trend is illustrated in the following images.

Figure 3.1 Growth pattern of Lohgaon (2011, 2018, 2023)



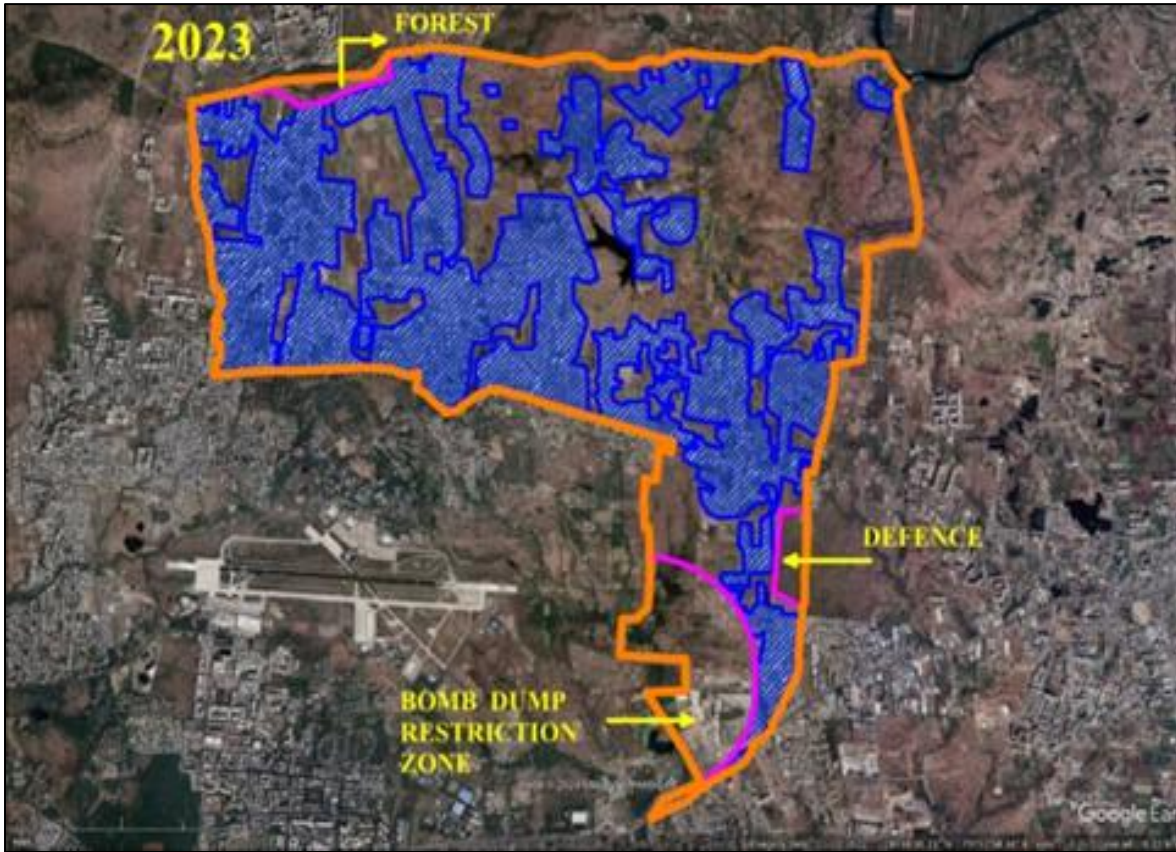


Figure 3.2 Growth pattern of Mundhwa (2011, 2018, 2023)

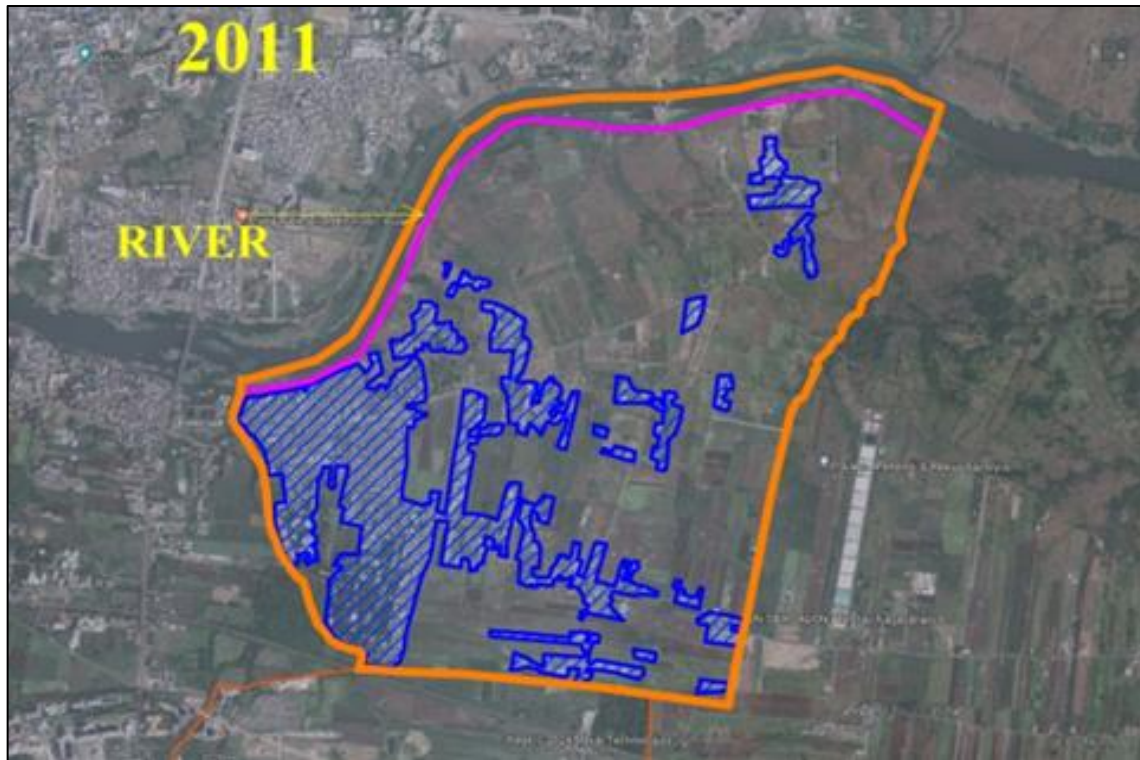
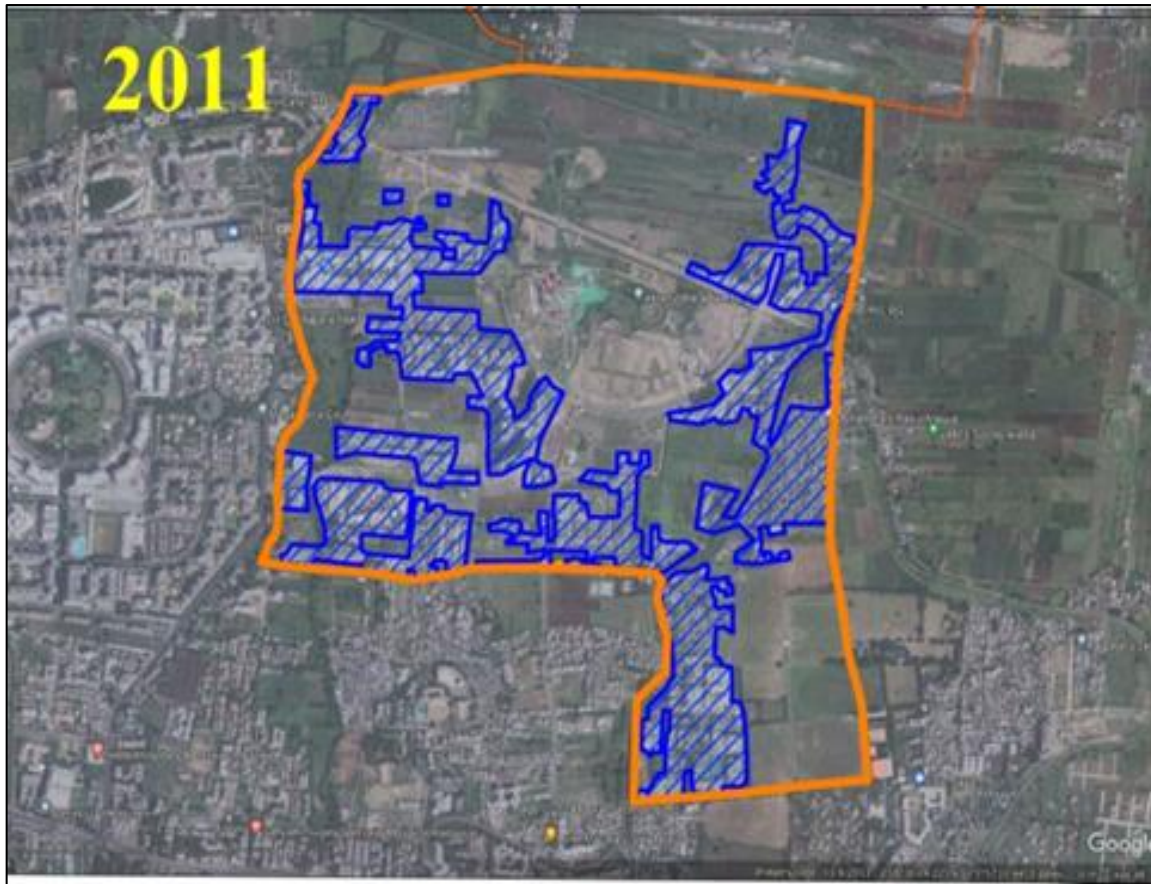




Figure 3.3 Growth pattern of Hadapsar (2011, 2018, 2023)



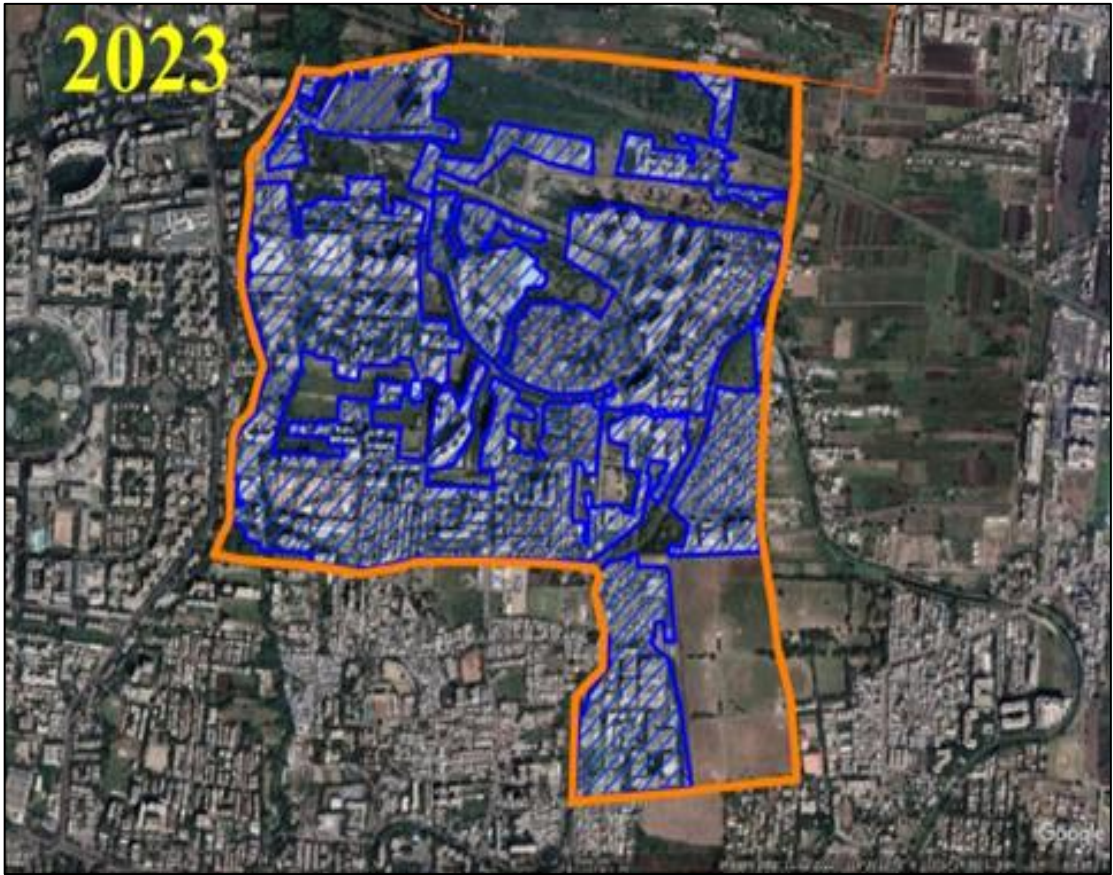
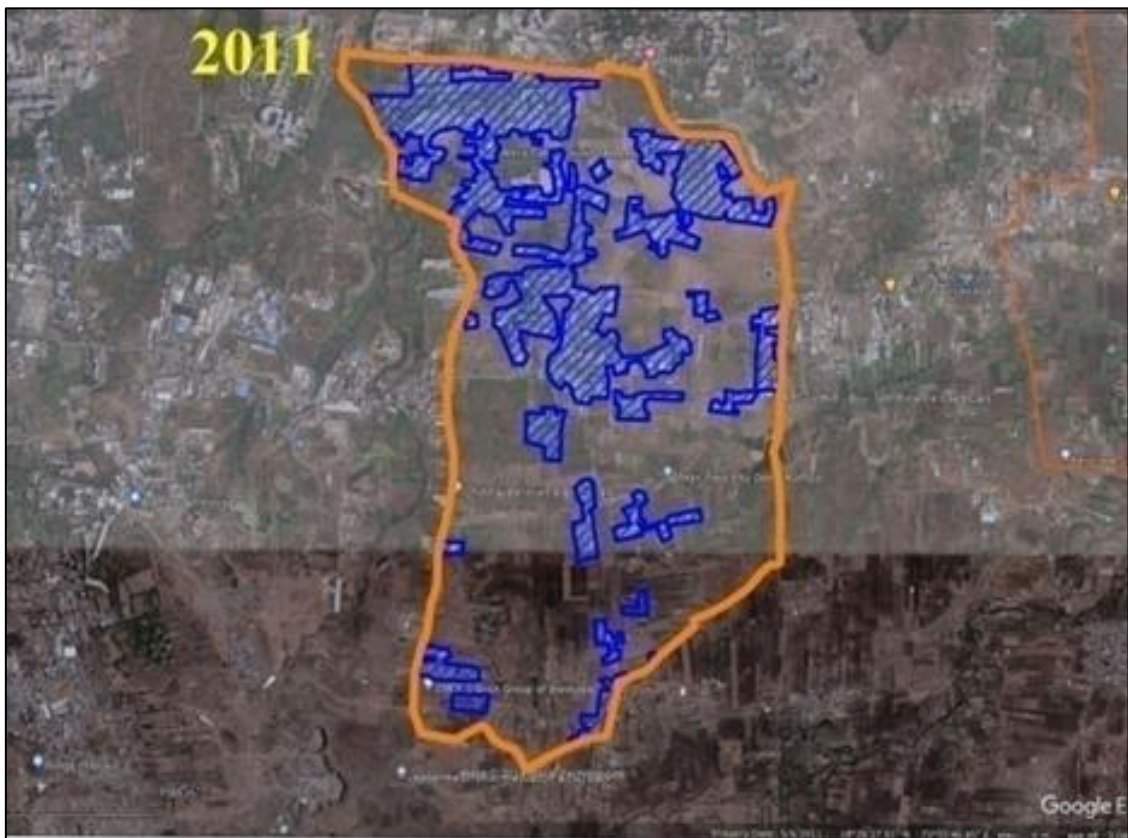


Figure 3.4 Growth pattern of Undri (2011, 2018, 2023)



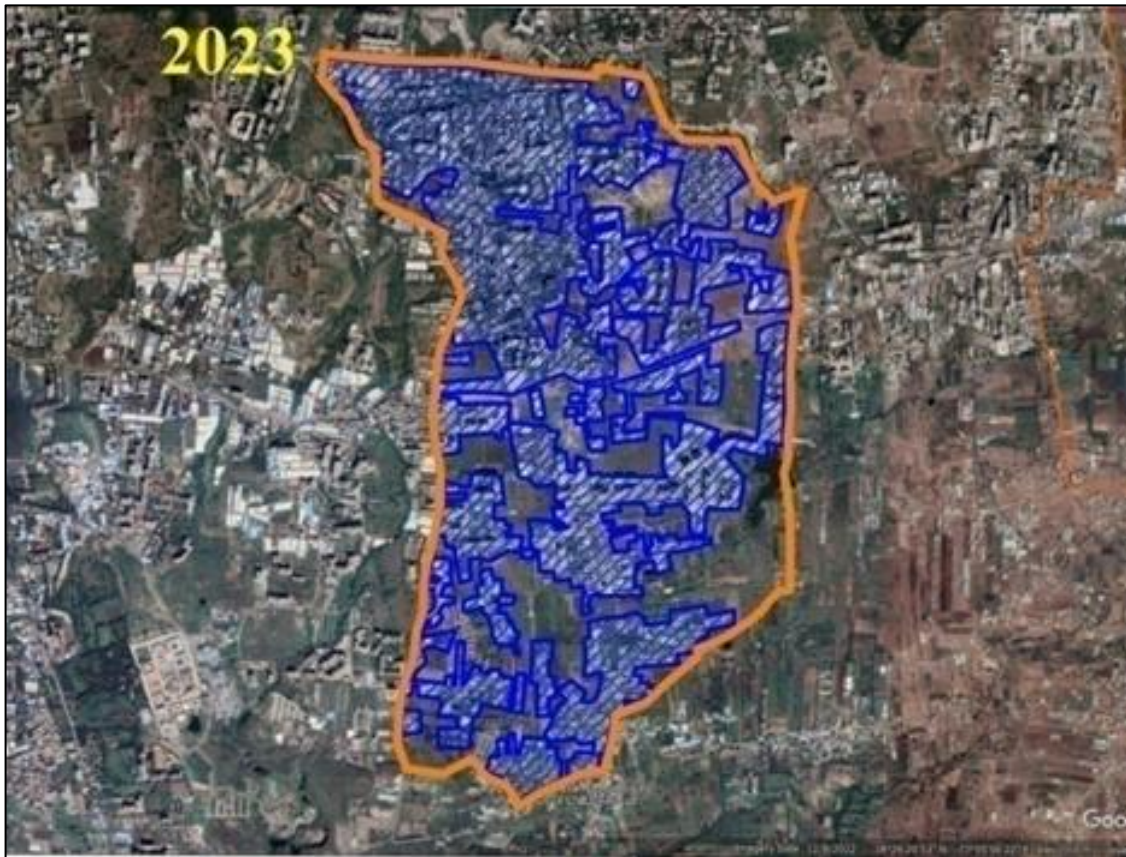
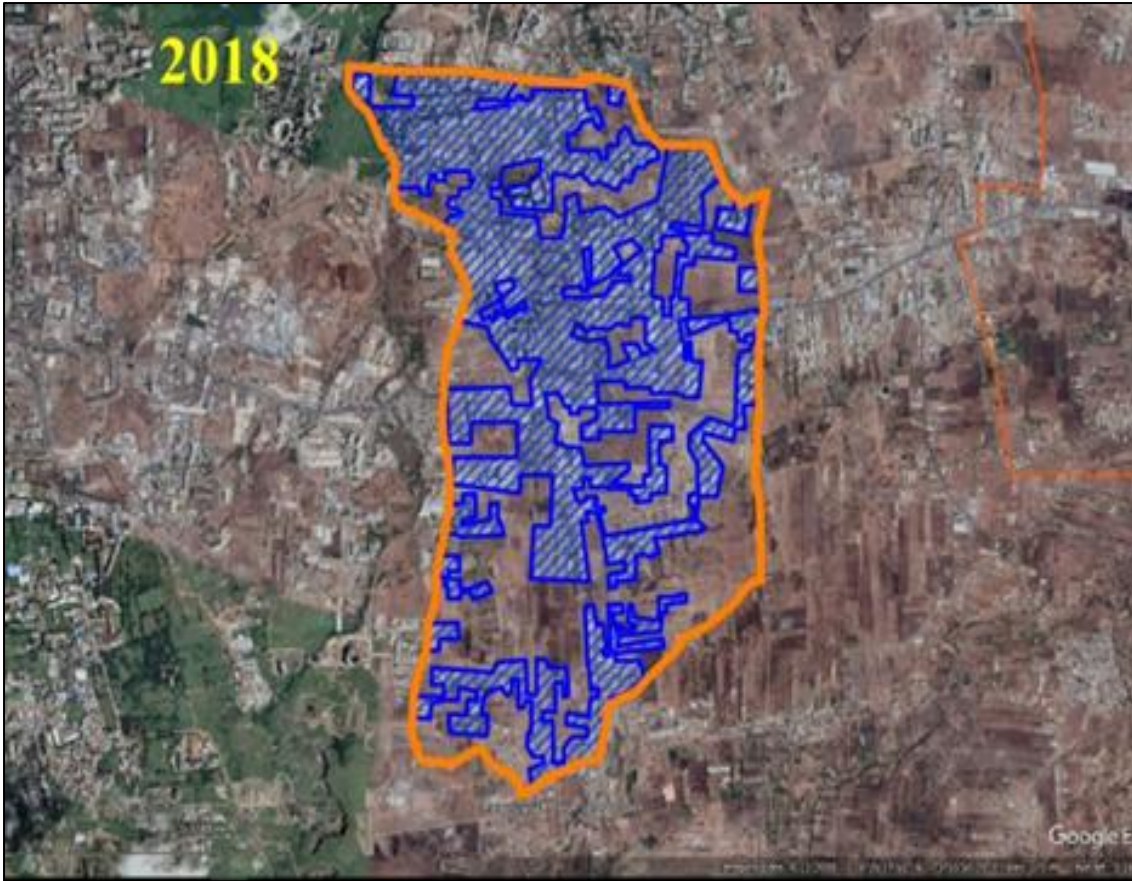


Figure 3.5 Growth pattern of Ambegaon Budruk (2011, 2018, 2023)

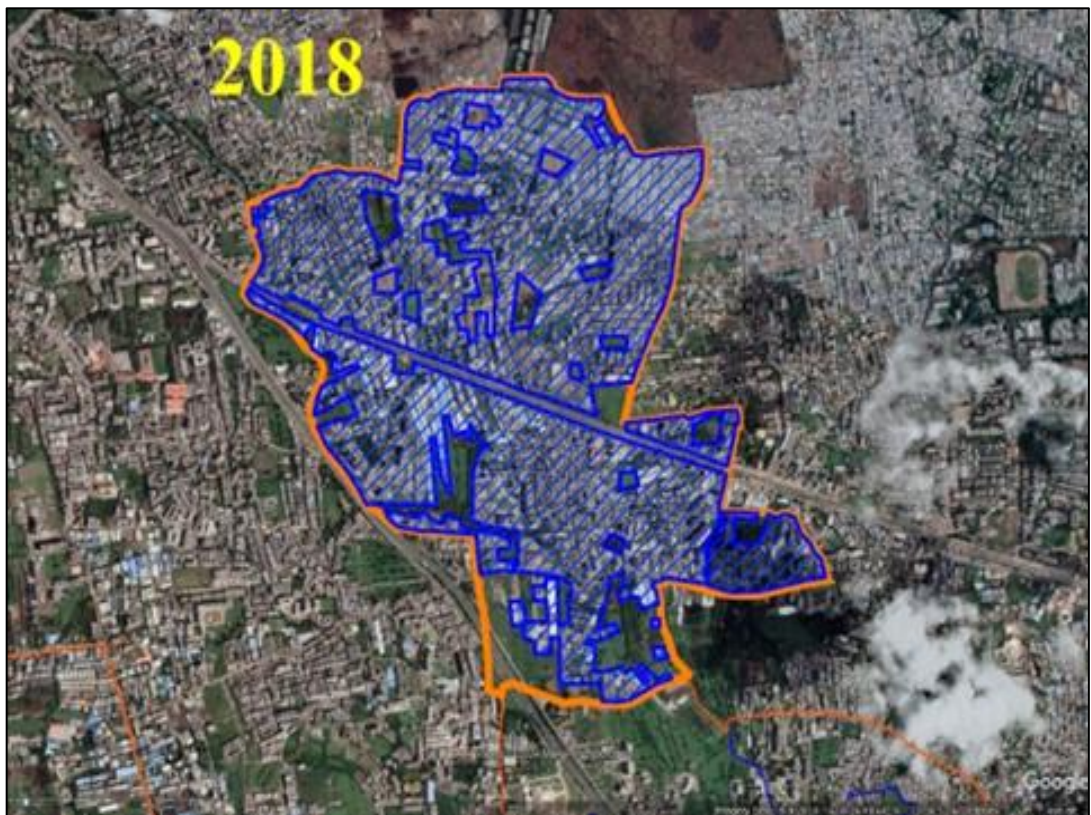
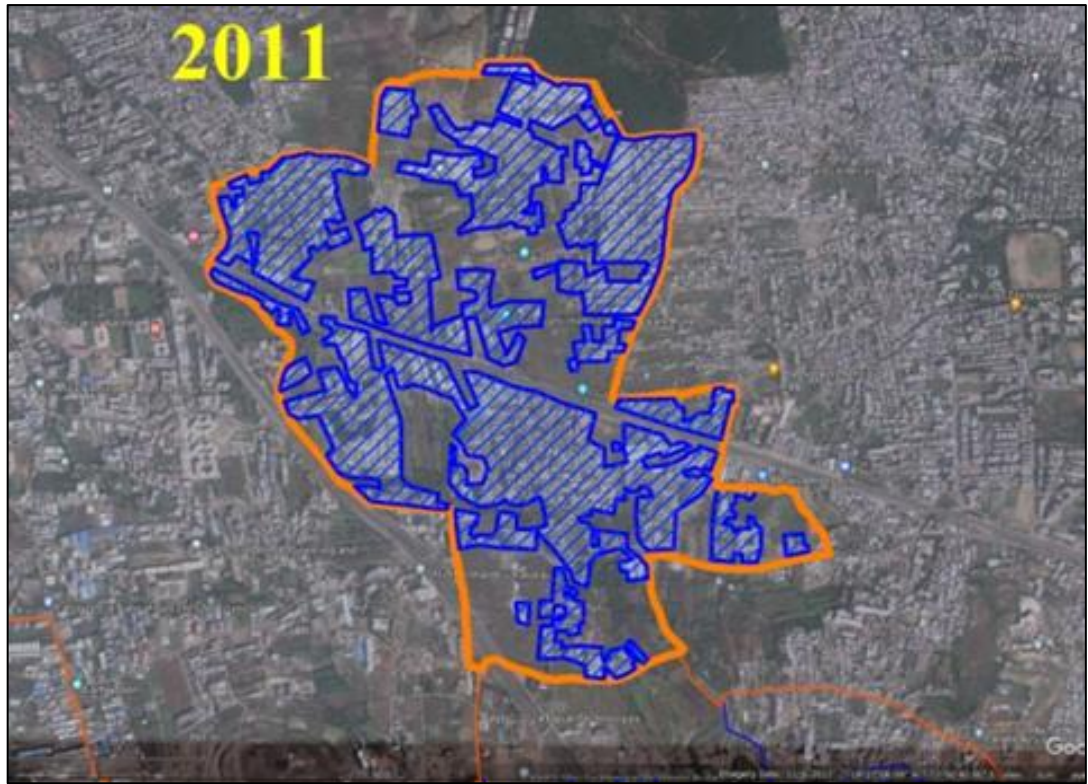
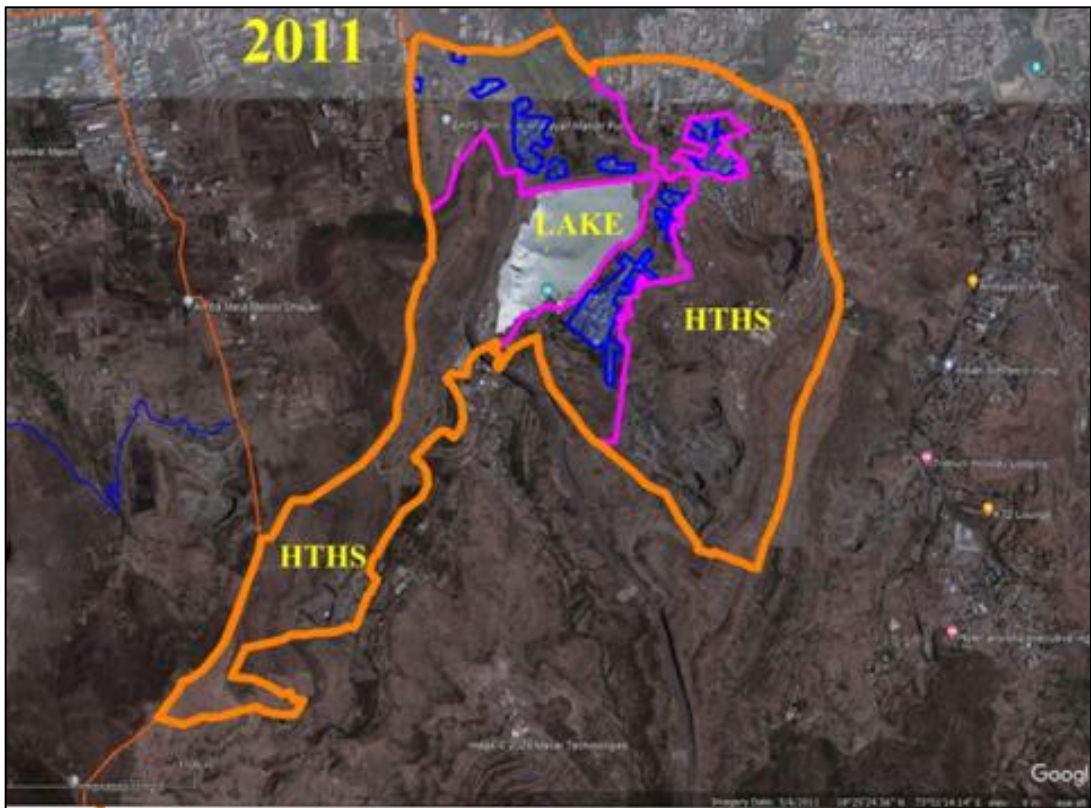




Figure 3.6 Growth pattern of Ambegaon Khurd (2011, 2018, 2023)



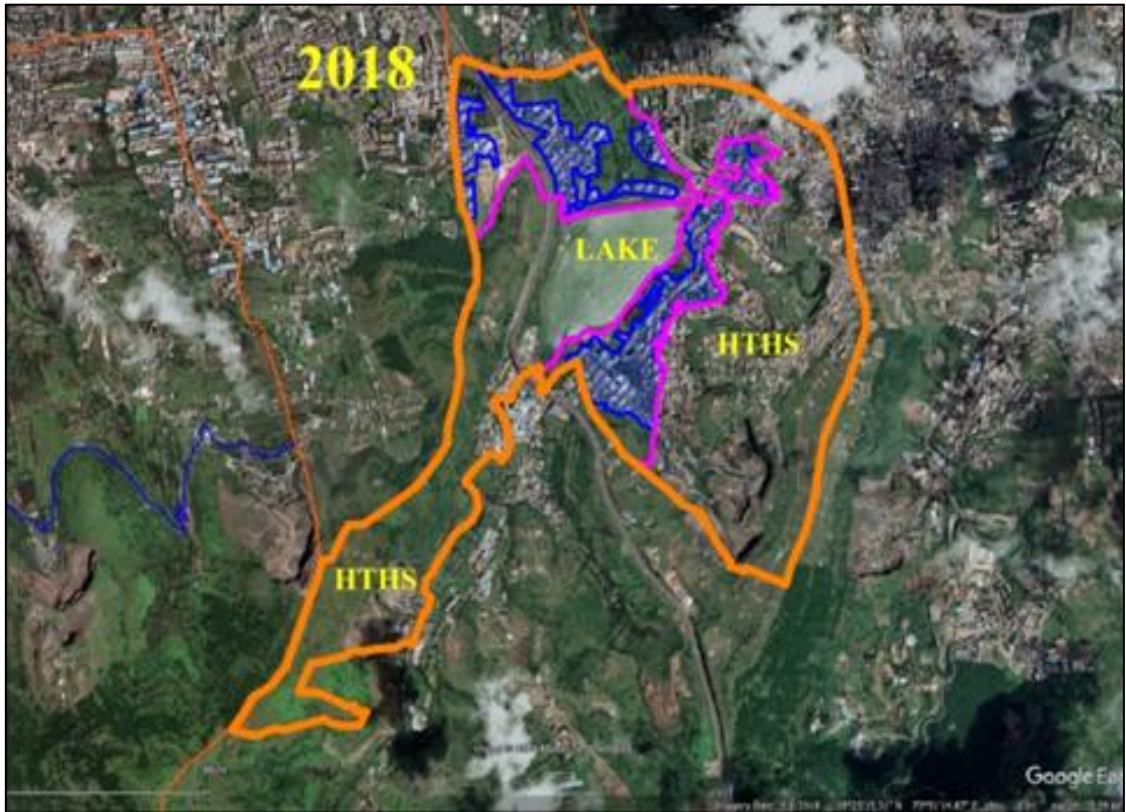


Figure 3.7 Growth pattern of Dhayari (2011, 2018, 2023)

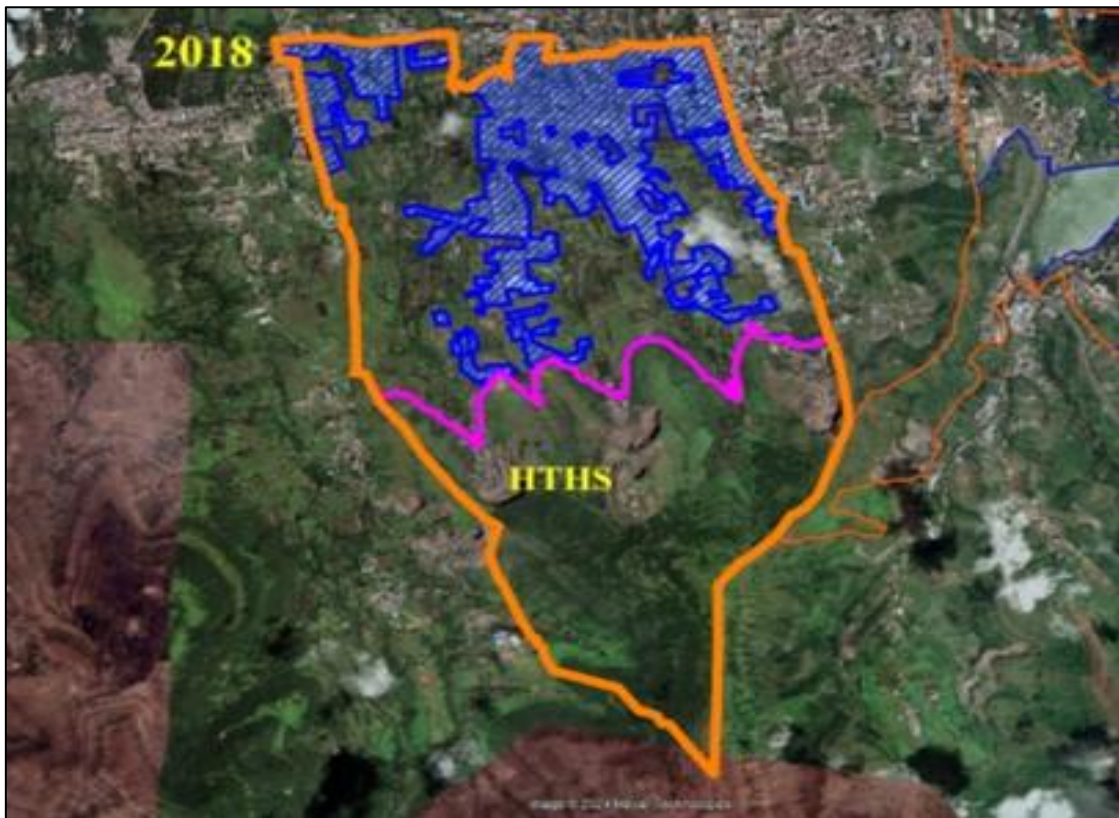
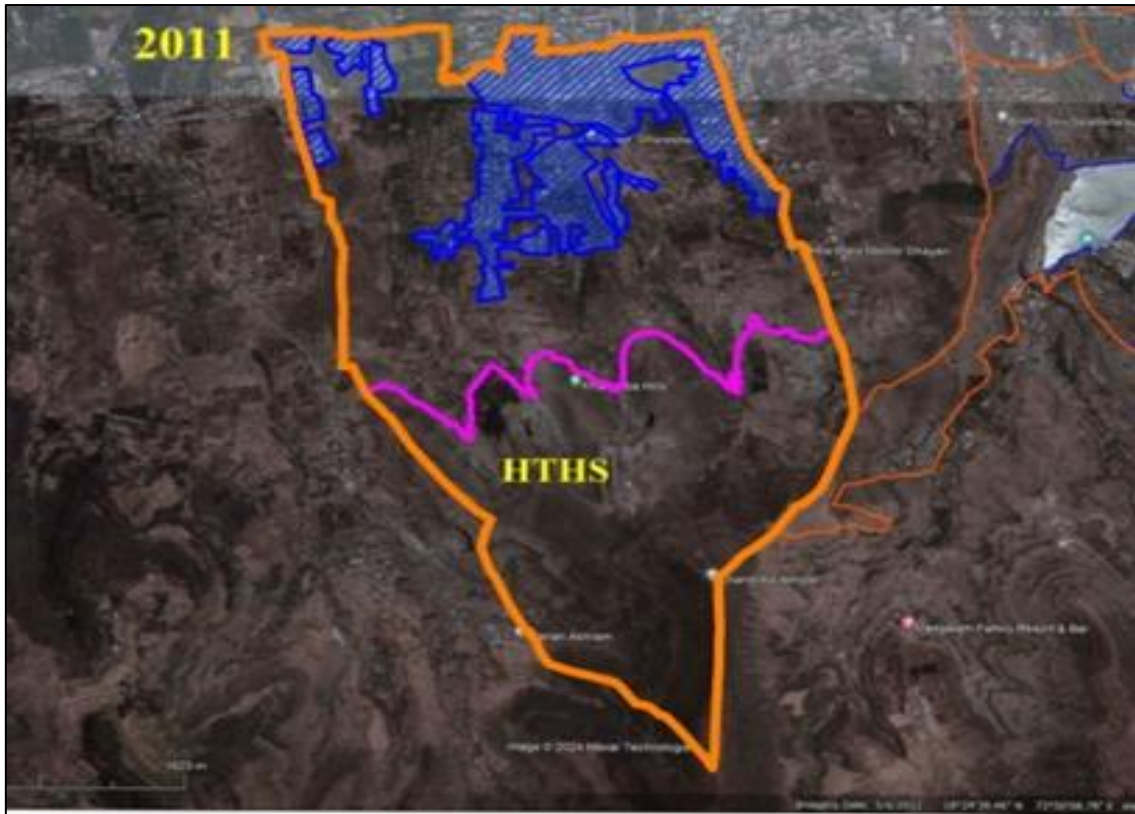
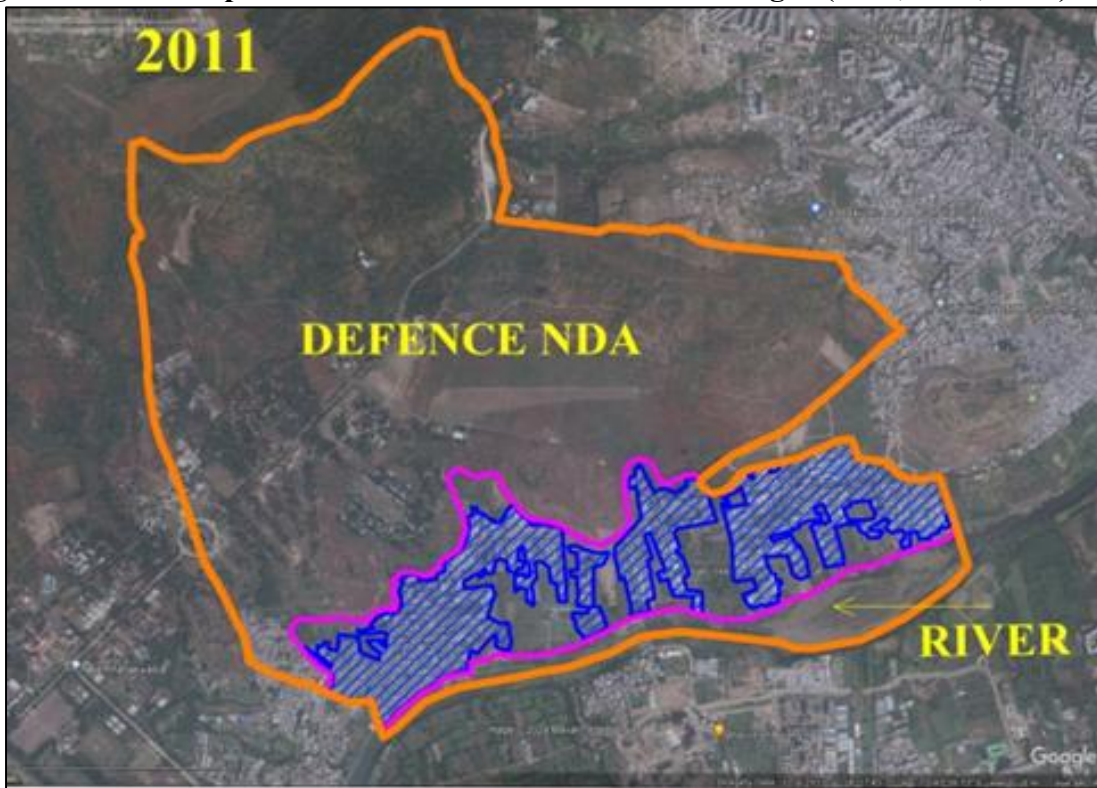
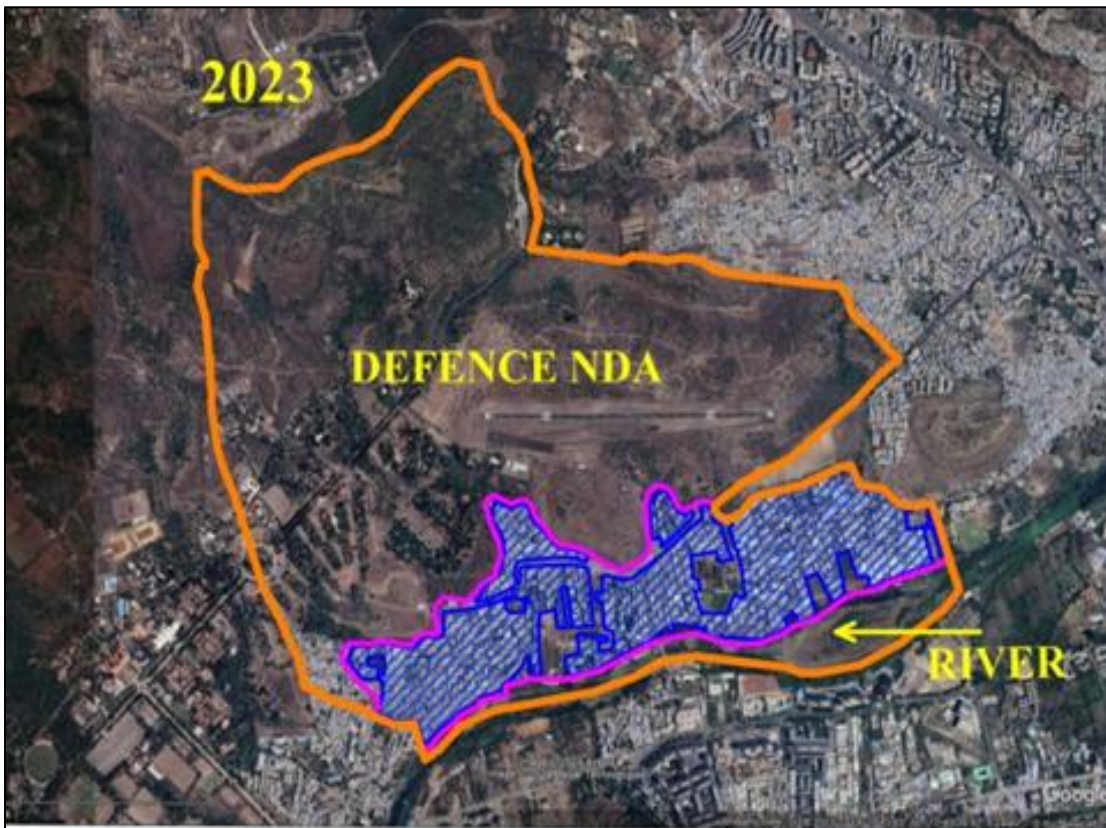
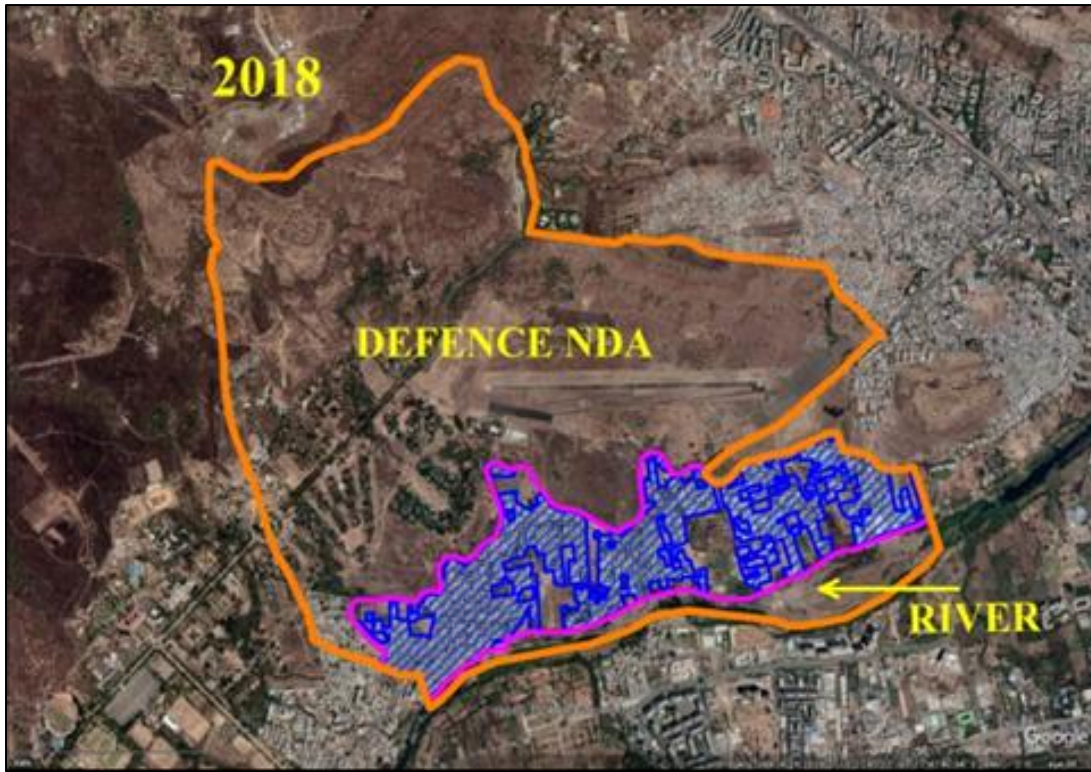




Figure 3.8 Growth pattern of Shivane & Shivane Uttam Nagar (2011, 2018, 2023)





3.3.2 Growth potential of villages

Based on the availability of resources, existing infrastructure, and proximity to the city, the nine villages are at varying stages of urbanization. Considering the potential for growth and spatial expansion, the villages have been categorized into three groups: low, medium, and high growth potential. This classification takes into account the availability of developable land and other resources. The calculation of developable area excludes land under water bodies, defense zones, forests, mines and quarries, and High Tension/Highway Safety (HTHS) zones. In contrast, it includes areas designated for residential, commercial, industrial, public and semi-public uses, transportation and traffic networks, services, and recreational facilities.

Table 3.6 Developable area in nine villages

Village Name	Total Area (ha)	Non-Developable area (ha)	Developable area (ha)	% of Developable area w.r.t Total Area
Lohgaon	1978.991	73.4977	1905.494	96.28
Mundhwa	467.108	35.569	431.539	92.39
Hadapsar	325.924	11.983	313.941	96.32
Undri	434.407	7.081	427.326	98.37
Ambegaon BK	247.360	4.567	242.793	98.15
Ambegaon KH	376.174	252.342	123.831	32.92
Dhayari	941.935	457.428	484.507	51.44
Shivane & Shivane (Entire Uttam Nagar)	779.188	602.387	176.801	22.69
Fursungi and Uruli Devachi Garbage Processing Plant	64.97	0	64.97	100
Total	5616.057	1444.855	4171.202	74.27

(Source: ELU Survey)

3.3.3 Topography

Contours are integral part of Existing Land Use map as per Govt. guidelines mentioned earlier. The contours of planning area provide crucial data about its terrain. The data was further used for slope analysis for identifying the areas apparently having slope steeper than 1:5 apart from HTHS in the Regional Plan. Mundhwa, Hadapsar, Undri, Ambegaon Budruk, Shivane have fairly flat terrain, with isolated hillocks in some of these villages. Hilly areas are on the North and North-East of village Lohgaon and on South of villages Dhayari, Ambegaon Khurd. Streams originating in the hilly areas traverse through these villages. Following contours maps show the terrain of the nine villages.

Map 3.1 Topographic map of Lohgaon

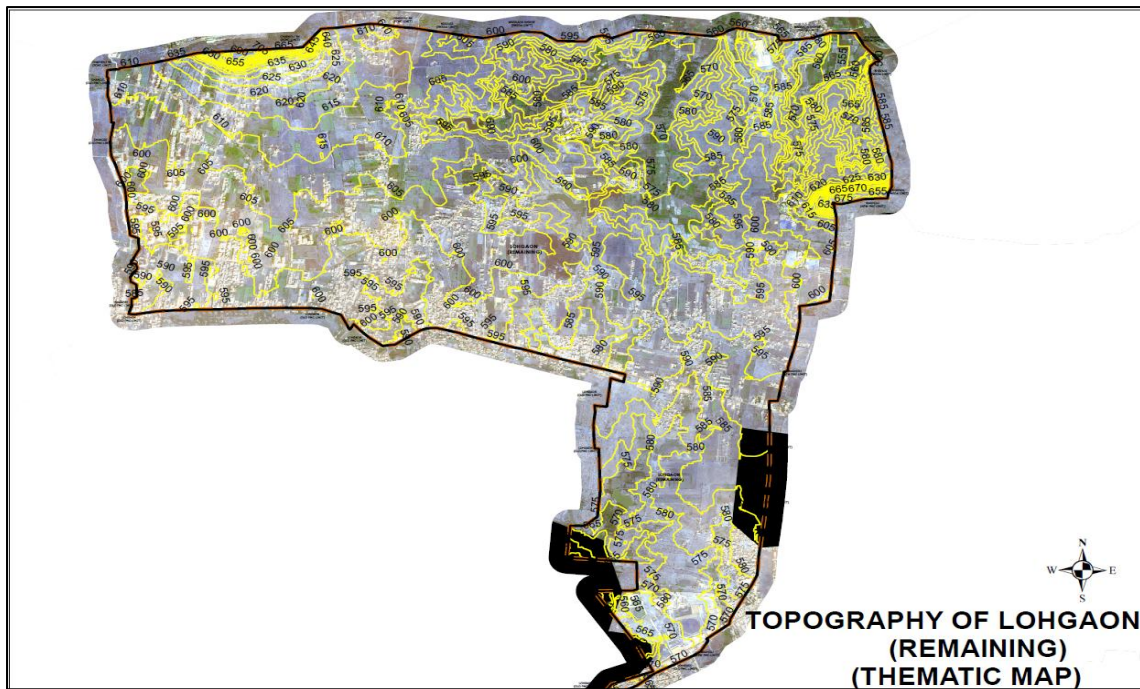
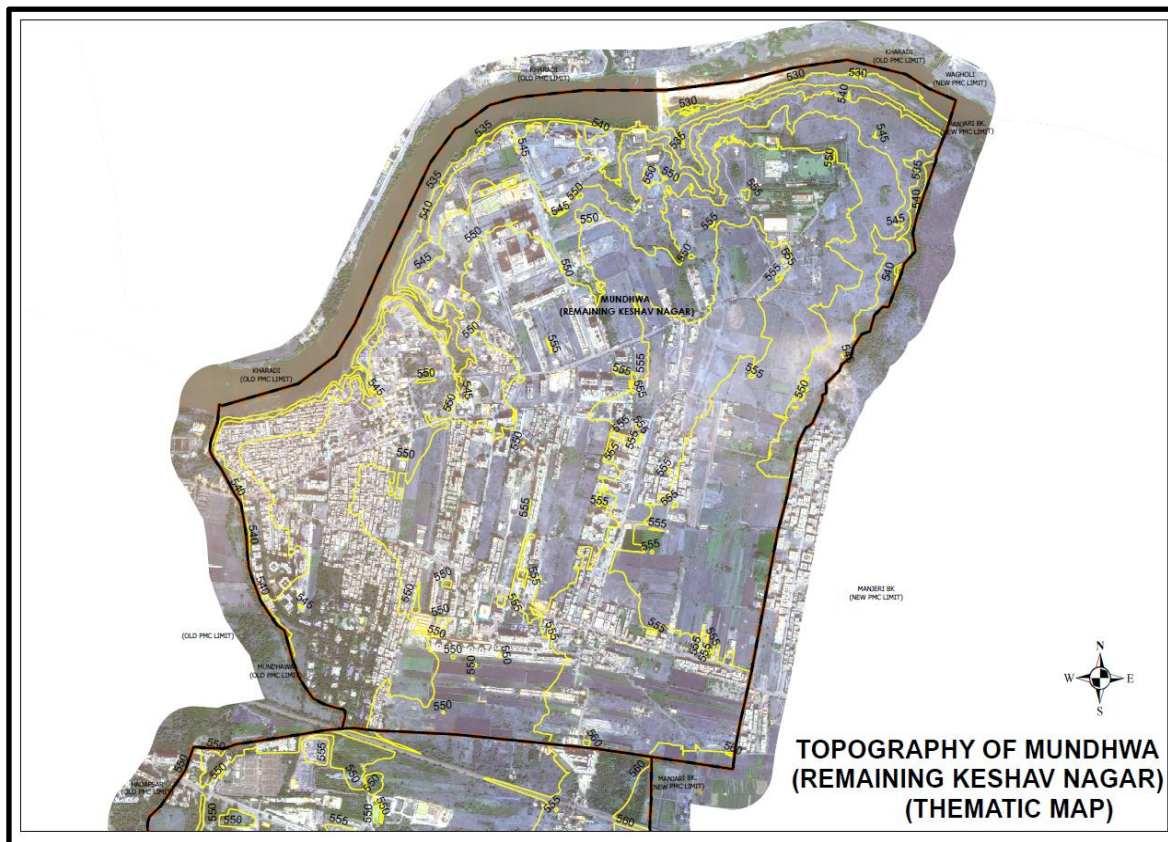


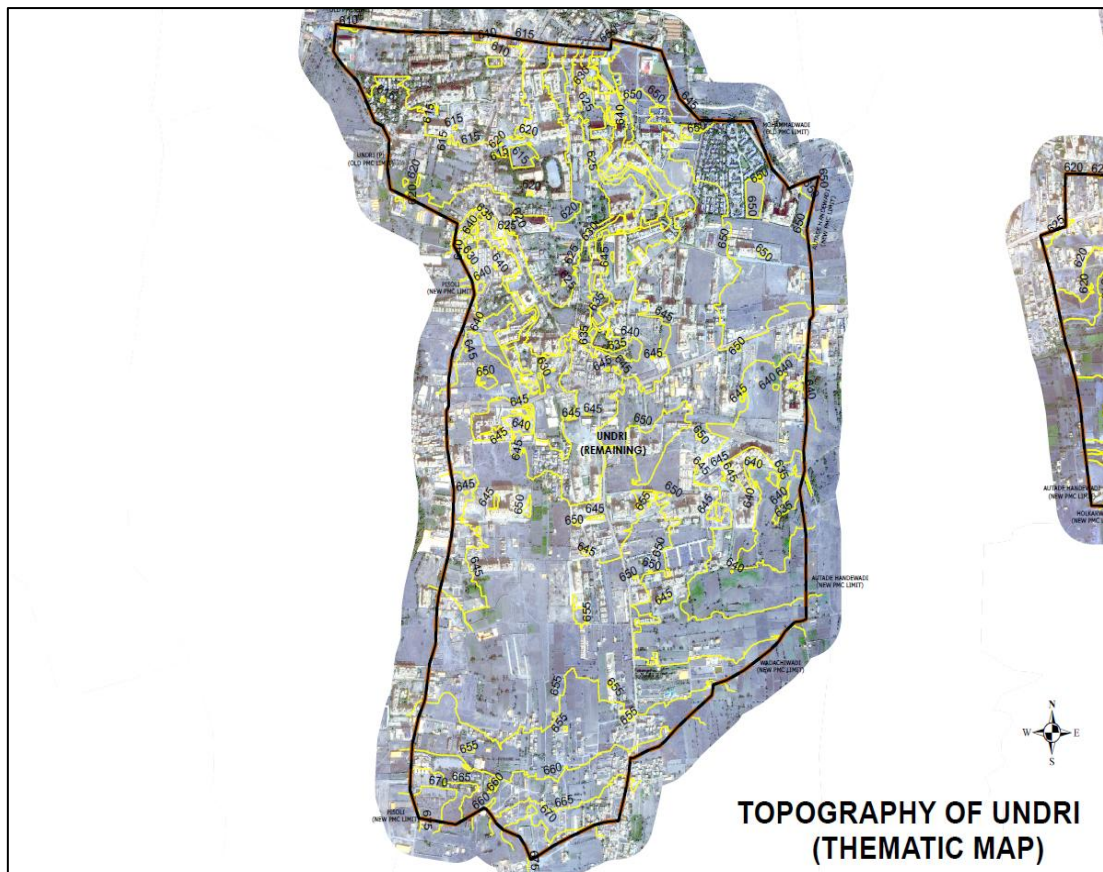
Figure 3.9 Topographic map of Mundhwa-Keshav Nagar



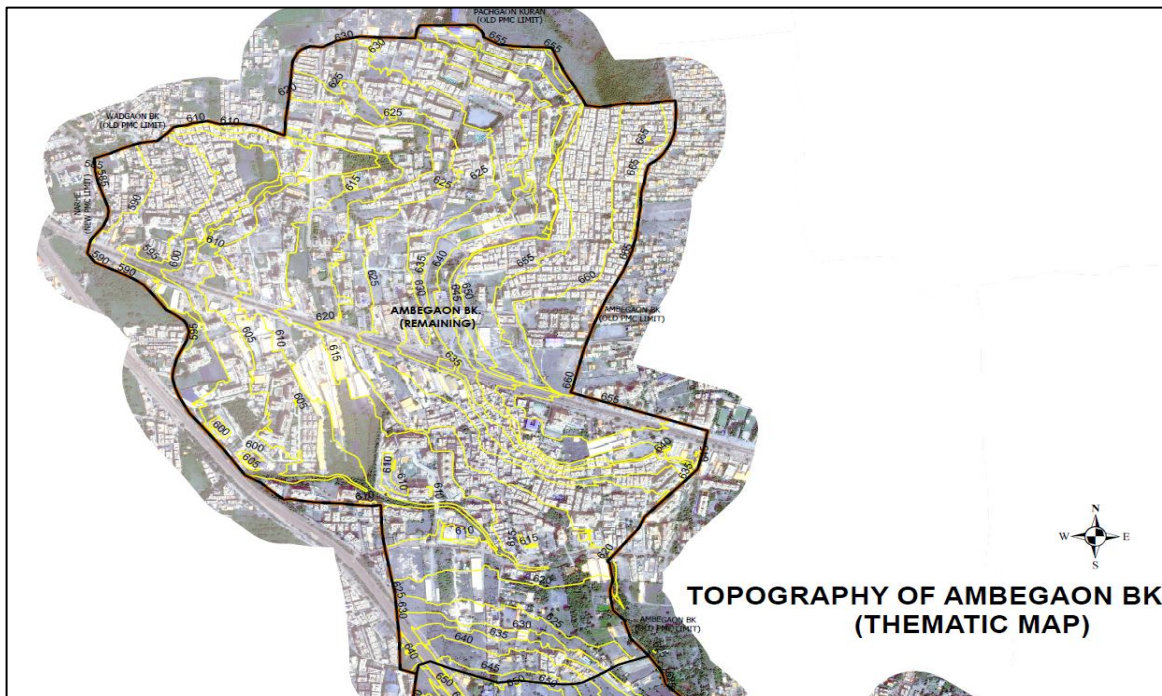
Map 3.2 Topographic map of Hadapsar-Sadesataranali



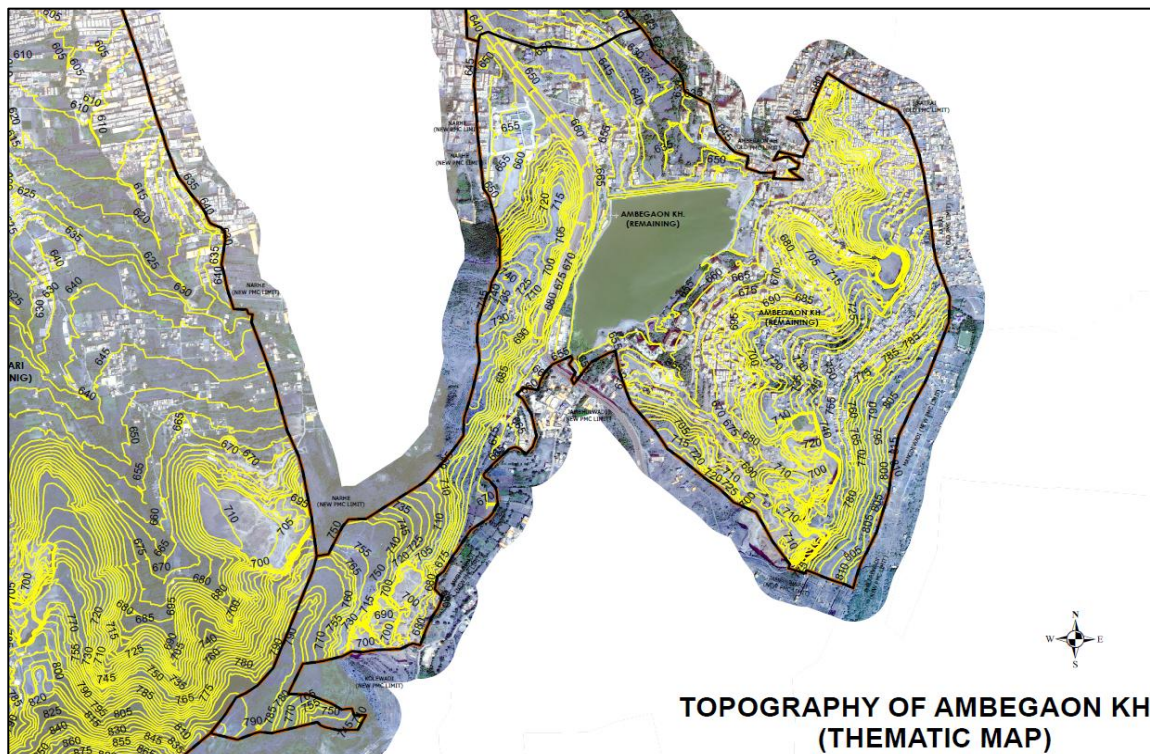
Map 3.3 Topographic map of Undri



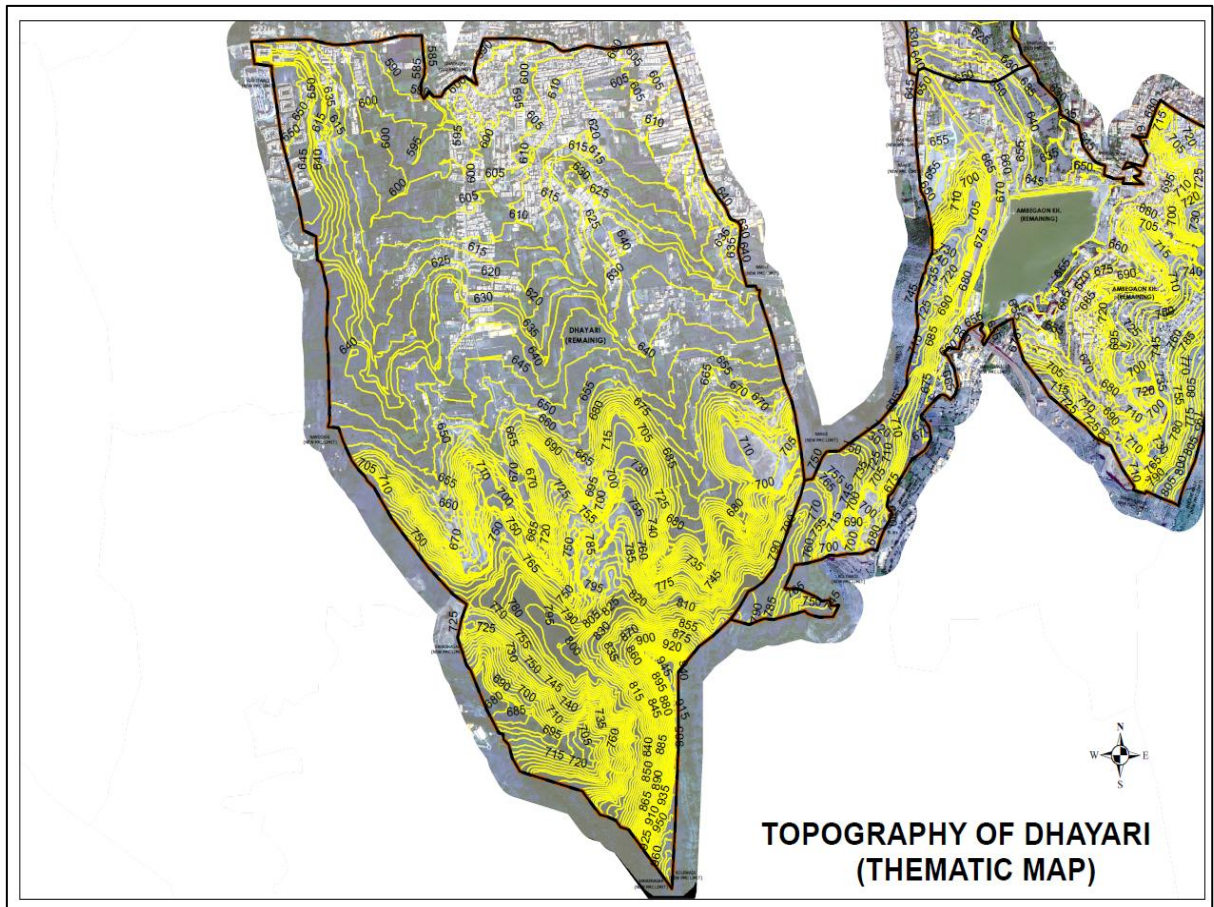
Map 3.4 Topographic map of Ambegaon Budruk



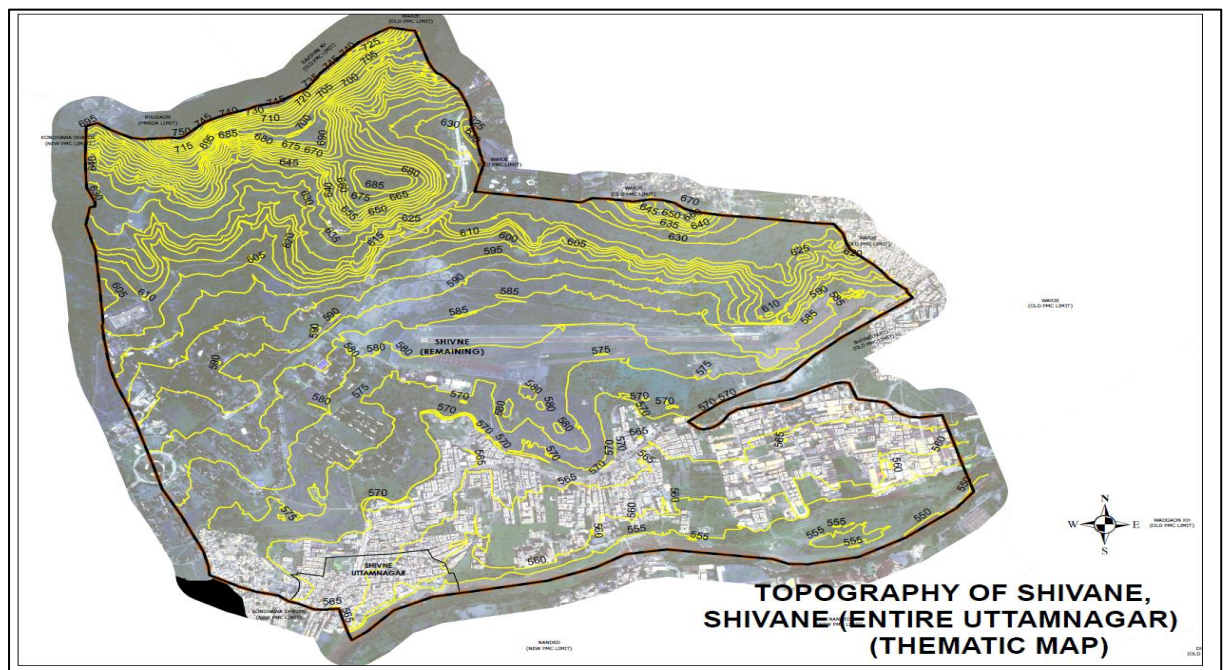
Map 3.5 Topographic map of Ambegaon Khurd



Map 3.6 Topographic map of Dhayari



Map 3.7 Topographic map of Shivane-Shivane Uttam Nagar



3.3.4 Land use pattern and area distribution

As per URDPFI:2015 Guidelines the recommended distribution of land use is as follows

Table 3.7 Land use distribution in metropolitan cities

Sr. No	Land Use Category	Percentage of developed area for Metropolitan cities
1.	Residential	36-38
2.	Commercial	5-6
3.	Industrial	7-8
4.	Public-Semipublic	10-12
5.	Recreational	14-16
6.	Transport & Communication	12-14

The data collected from the existing land use survey shows details of existing land use in nine villages. Table No 4.1 shows distribution of existing land use in nine villages. It is observed that the total developed area in the planning area is about 5616.057 ha while the developable area is 4171.202 ha. Efforts are made to earmark 40% of the developable area for future residential development, while that for other land uses vastly depends on the growth characteristics of individual villages.

3.3.5 Carrying capacity

Carrying capacity is defined as the ability that can absorb the population growth or physical development without considerable degradation or damage. The carrying capacities of these nine villages are assessed against applicable norms and standards for provision of basic services like water supply, sewerage, solid waste disposal in quantitative and qualitative terms. It can be stated in terms of development density and population density.

- i) **Development density** in terms of total built up area over relevant residential area.

Table 3.8 Development density in nine villages

Sr. No.	Village	Development Density
1	Lohgaon	1.18
2	Mundhwa	1.39
3	Hadapsar	1.88
4	Undri	1.58
5	Ambegaon Budruk	2.76
6	Ambegaon Khurd	2.14
7	Dhayari	2.34
8 & 9	Shivane and Shivane-Uttamnagar	3.65

(Source: ELU Survey & Population Data from Gokhale Inst.)

ii) **Population Density** indicates the number of people per ha of the planning area.

Table 3.9 Population density in nine villages

Sr. No.	Village	Population Density	
		Over Entire Area of Village (persons per Ha)	Over Developable area (persons per Ha)
1	Lohgaon	62	64
2	Mundhwa	146	158
3	Hadapsar	144	150
4	Undri	70	71
5	Ambegaon Budruk	274	279
6	Ambegaon Khurd	94	116
7	Dhayari	39	54
8 & 9	Shivane and Shivane-Uttamnagar	71	313

(Source: ELU Survey & Population Data from Gokhale Inst.)

3.3.6 Services

i) Sanitation

Most of the buildings in the nine villages are connected to sewers or have septic tanks. However current provisions for treatment of the sewage from these villages are insufficient. Hence from analysis of the available data working for required sewage treatment is done

As per sanitation DPR

Considered rate of water supply	150 lpcd
Sewage generation 80%	120 lpcd
Total Sewage (with 5% infiltration)	126 lpcd
Proposed decentralised STPs	5 Nos
Location and Capacity	Dhayari (21 MLD) Ambegaon Budruk (27 MLD) Lohgaon (13.5& 11 MLD) Mundhwa- Keshavnagar (19MLD)

Sewerage from Hadapsar (Sadesatranali) will be treated at Mundhwa STP. The sewerage from rest of the nine villages will be treated as per the outfall of sewerage network in the respective catchment area. e.g. sewerage from Undri will be treated at Manjri STP, while sewerage from Shivane and Shivane-Entire Uttamnagar will be treated at Warje.

ii) Water Supply

Water treatment plants by Maharashtra Jeevan Pradhikaran under NRDWP:

Location	Fursungi	Kondhwe Dhawde
For Villages	Fursungi & Uruli Devachi	Shivane & Shivane-Uttam Nagar
Plant Capacity	33MLD	6.5MLD

Apart from the water works catering to Shivane and Shivane-Uttam Nagar, capacity of water works required to cater to the rest of the villages is analyzed on the basis of a standard water supply of 150 lpcd based on the population of which worked out to be around 175 MLD.

3.3.7 Status of Infrastructure, Amenities, Facilities

The survey of the planning area revealed the following information regarding existing infrastructure and amenities.

Table 3.10 Status of education, health and recreational facilities

S. No	Village	PS	HS	PHC/D/ Clinic	H (Beds)	PG/CPG	G/PK
1	Lohgaon	16	8	52	8 (188)	1	-
2	Mundhwa	10	6	24	10 (21)	-	-
3	Hadapsar	8	5	18	4 (171)	-	2
4	Undri	8	8	35	2 (5)	-	-
5	Ambegaon Budruk	8	9	18	9	-	-
6	Ambegaon Khurd	4	-	9	-	-	-
7	Dhayari	8	7	42	3 (53)	2	-
8 & 9	Shivane and Shivane (Entire Uttam Nagar)	9	7	48	7 (110)	-	-

(Source: ELU Survey)

Out of total Healthcare facilities within the nine villages there are 7 Government Primary Health Care Centres, while 30% Educational facilities are provided by the Government.

Table 3.11 Status of road (no. of major roads)

Village	NH	SH	MDR	RP Roads	Ring Road
Lohgaon	-	1	1	3	1
Mundhwa	-	-	1	4	-
Hadapsar	-	-	-	5	-
Undri	2	1	2	4	-
Ambegaon Budruk	2	-	-	2	-
Ambegaon Khurd	1	-	-	1	1
Dhayari	-	-	-	5	1
Shivane and Shivane Uttam Nagar	-	1	-	-	1

(Source: ELU Survey)

Table 3.12 Current status of traffic and transportation

Village Name	Modes of Travel			Trip	
	NMT (%)	Private (%)	Public (%)	Length (km)	Time (min.)
Lohgaon	21.94	57.80	19.9	10.05	42
Mundhwa	24.56	52.20	23.3	7.06	38
Hadapsar	25.92	61.30	12.80	6.85	33
Undri	25.49	55.7	19.10	7.06	22
Ambegaon Bk	18.75	35.80	45.2	5.42	27
Ambegaon Kh	18.11	66.20	15.20	8.49	38
Dhayari	9.65	63.00	27.9	7.12	31
Shivane	22.9	55.6	21.2	7.96	32
Shivane- Uttam Nagar	82	53.2	38.6	4.99	24

(Source: Data from Socio-Economic survey by Gokhale Inst.)

3.3.8 Demographic and Socio-Economic Characters of villages

The demographic and socio-economic characteristics of a village reflect the overall status of its residents. Pictorial representations of these characteristics provide a clear overview, allowing for quick assessment of village profiles. Village-wise data on key demographic and socio-economic parameters, derived from a sample survey with a total sample size of 5,000, are illustrated using Octagonal Radar Charts, as detailed below-

- Total Income- ₹50,000/- considered as 100%.
- Safe Drinking Water- No. of Households receiving Safe Drinking Water in percentage.
- Sanitation available- No. of households having proper sanitation in percentage.
- Pucca House- No. of houses having Pucca Structures in percentage.
- Literacy- No. of Literate Persons in percentage.
- Distance Traveled for working- 30 km distance as 100%.
- Sex ratio- No. of Females per 1,000 Males as 100%.
- Household size- Household of 6 Persons as 100%.

Figure 3.10 Demographic and socio-economic characteristics of Lohgaon

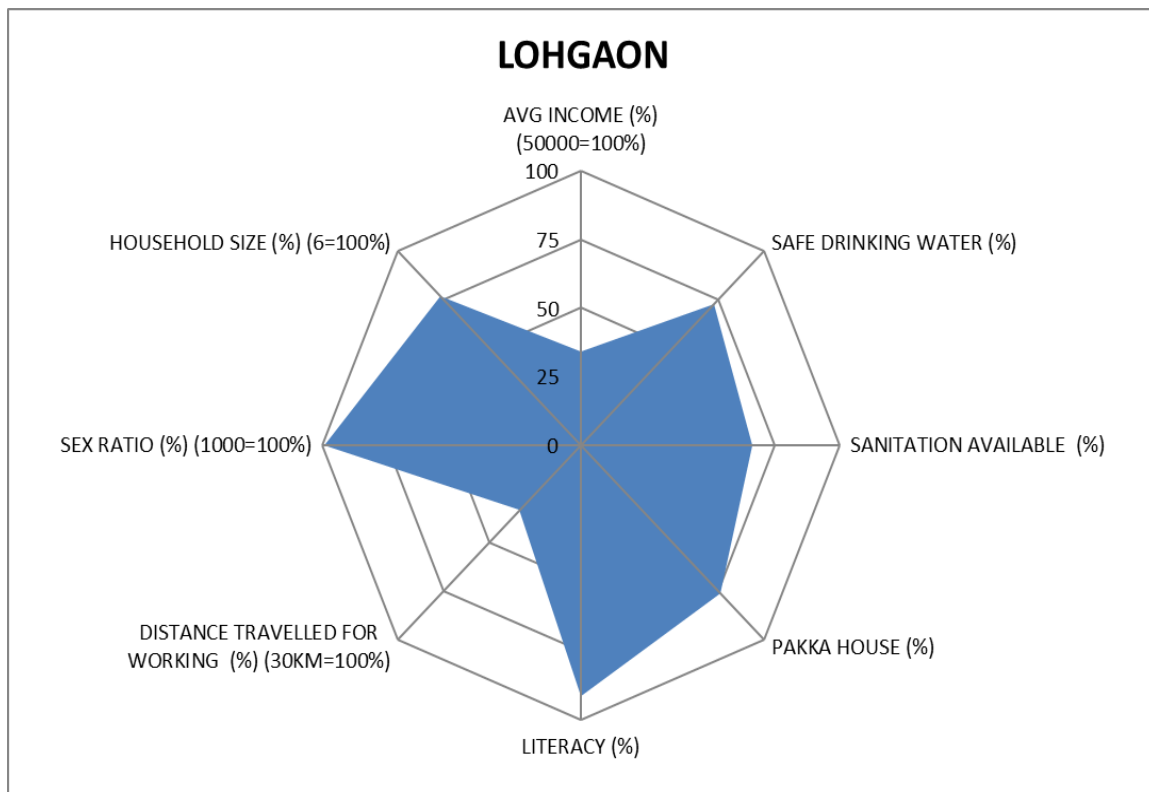


Figure 3.11 Demographic and socio-economic characteristics of Mundhwa

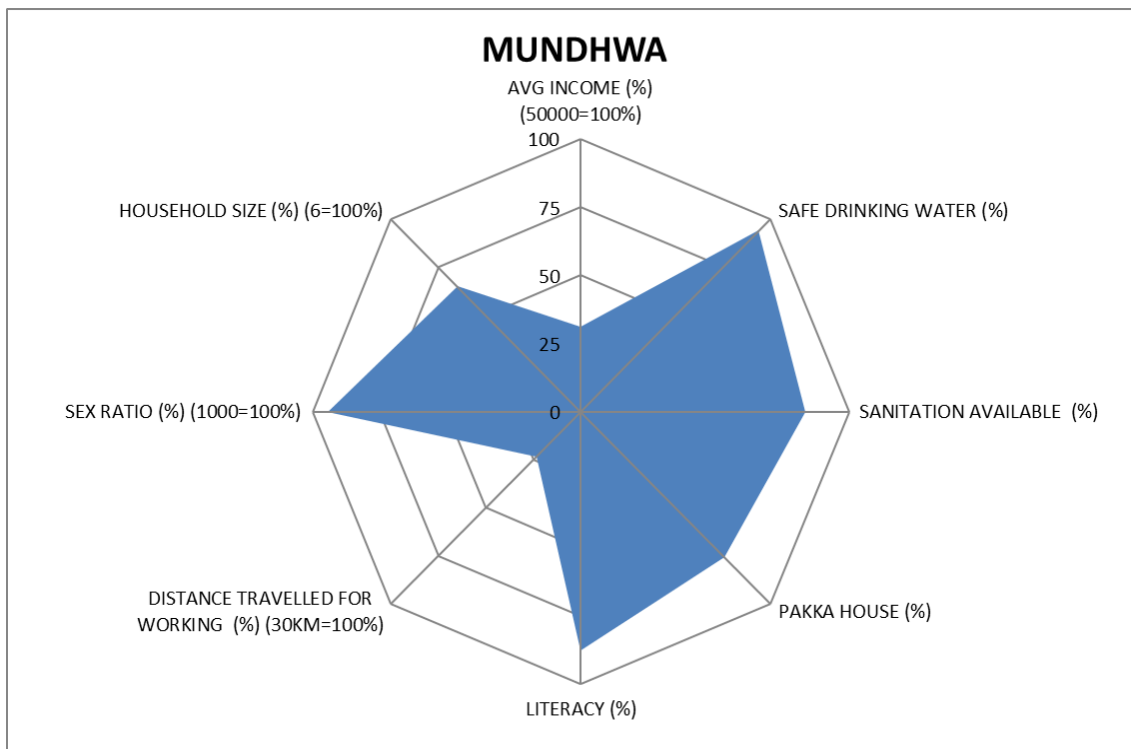


Figure 3.12 Demographic and socio-economic characteristics of Hadapsar

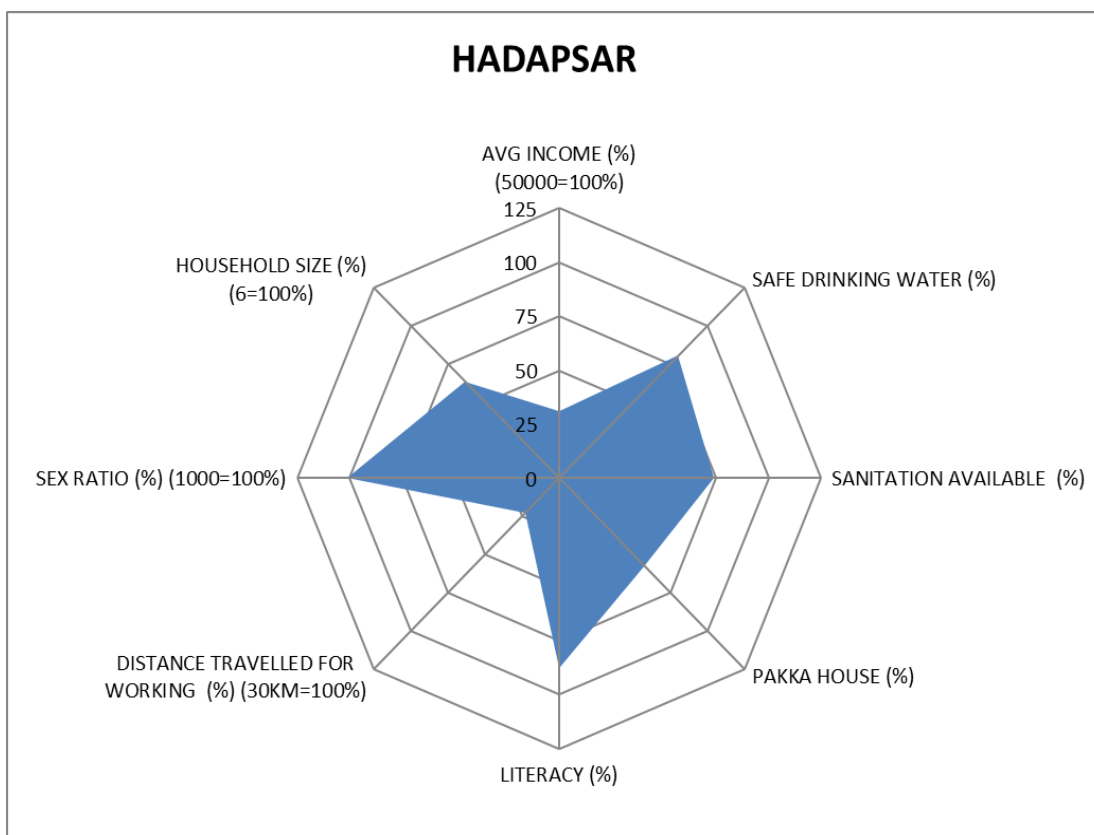


Figure 3.13 Demographic and socio-economic characteristics of Undri

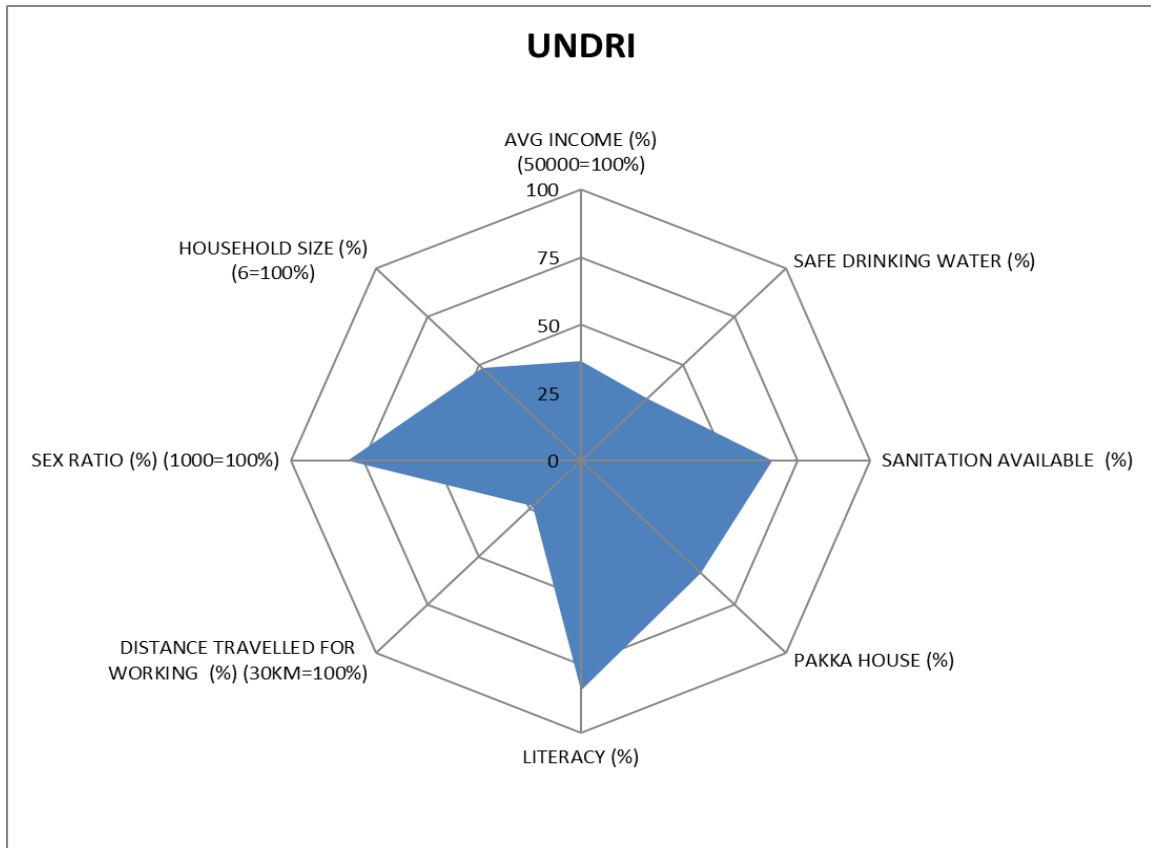


Figure 3.14 Demographic and socio-economic characteristics of Ambegaon Budruk

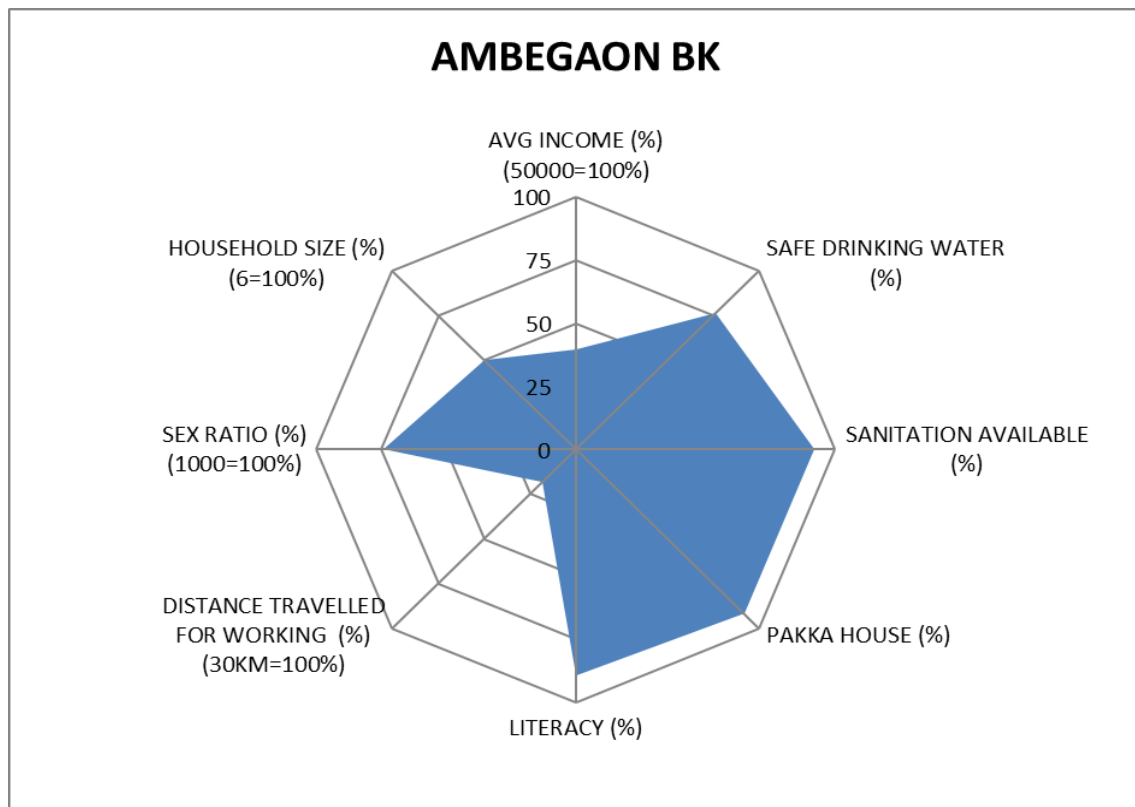


Figure 3.15 Demographic and socio-economic characteristics of Ambegaon Khurd

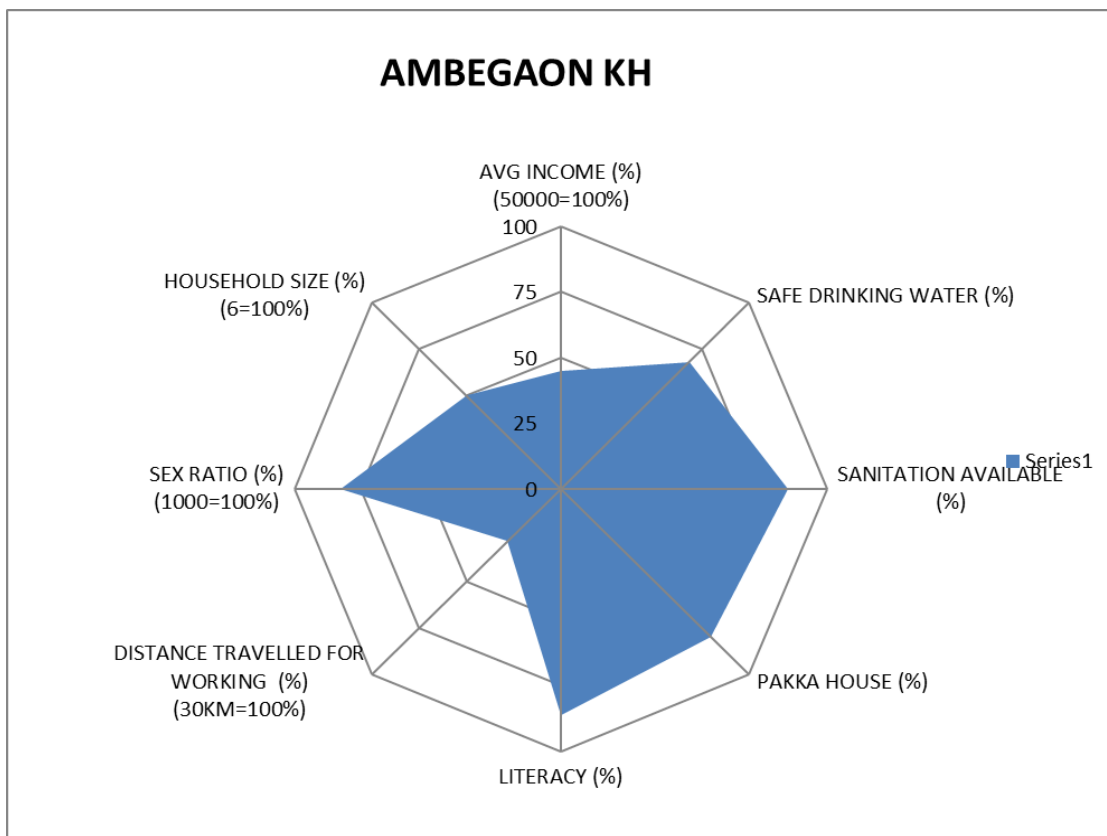


Figure 3.16 Demographic and socio-economic characteristics of Dhayari

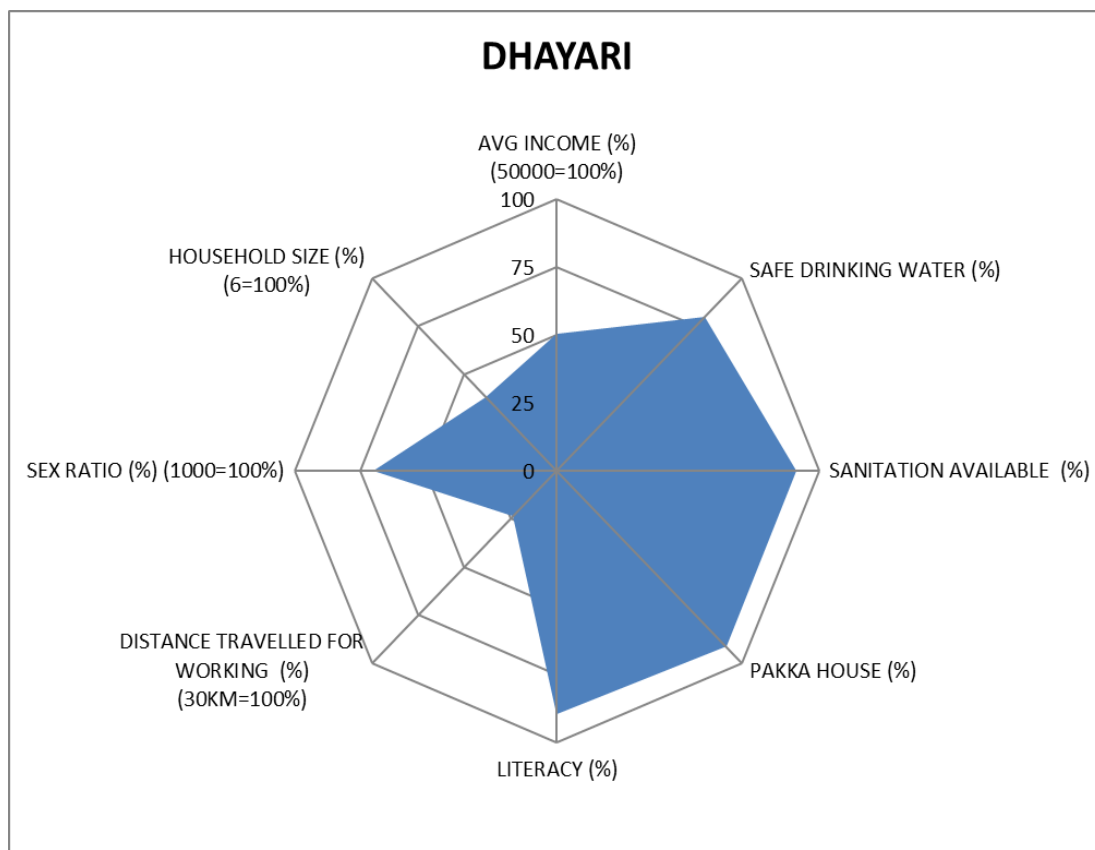
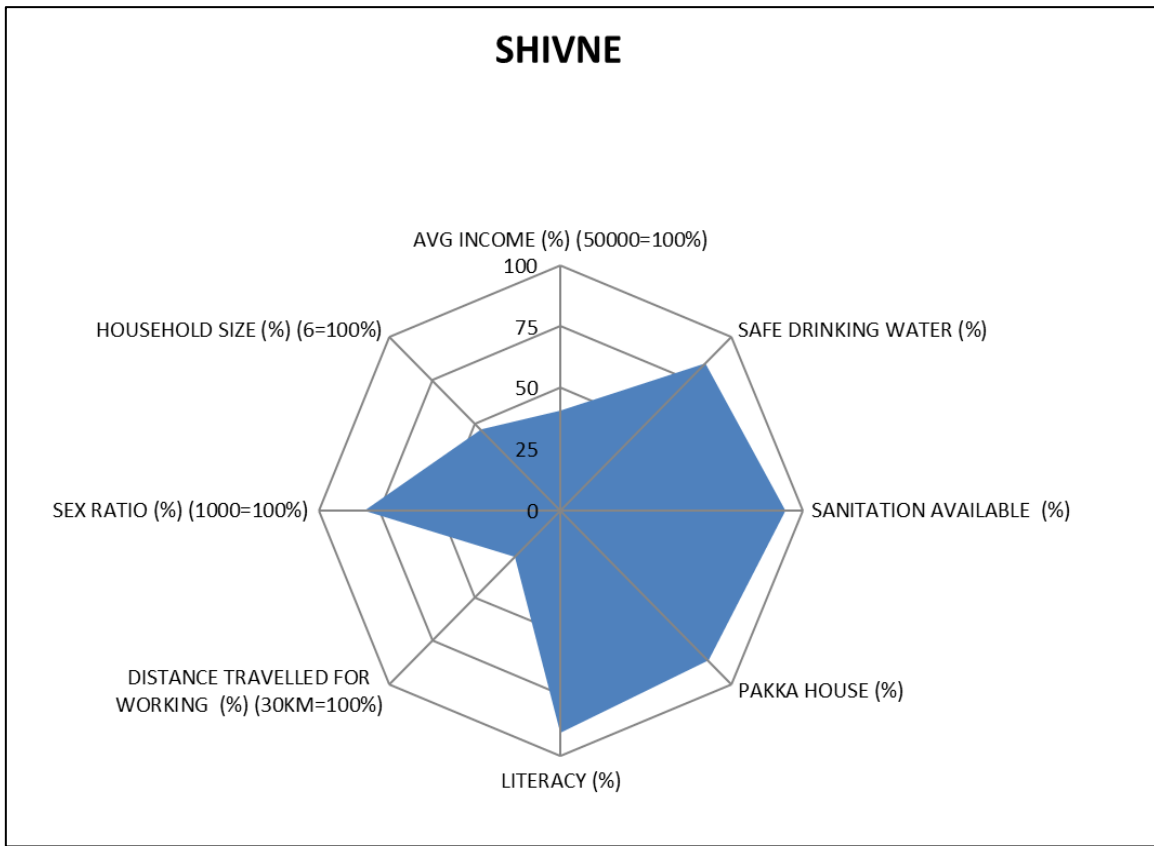


Figure 3.17 Demographic and socio-economic characters of Shivane & Shivane (Uttamnagar)



In addition to the previously mentioned factors, the socio-economic status of citizens- reflected through occupation, income, assets, housing, and related indicators- is also taken into account during the planning process. This aspect is discussed in detail in the chapters on Demography, Socio-Economic Studies, and Housing of the nine villages.

CHAPTER 4 : EXISTING LAND USE

Introduction

Adequate knowledge of present circumstances in the planning area is the prerequisite for planning. This includes the characteristics of the natural features, topography and information about the existing land use (conforming, non-conforming, extent, spread, etc.). Existing Land Use (ELU) Survey enables the planners to understand the character of existing development.

4.1 Contents of ELU Map

Contents of an ELU map can be enlisted as follows;

- **Boundaries:** Administrative, municipal limits, gaathan, zoning, existing industrial establishments, any specific important feature, land parcels with survey numbers.
- **Specific Areas:** Eco-sensitive areas, prohibited areas, defence areas, reserved or protected forest, site/precincts of historical/archaeological importance
- **Existing geographical features:** Water bodies, hilly areas, plains, waterlogged areas etc.
- **Contours of all lands**
- **Existing transport network**
- **Existing socio-economic facilities:** Educational, health, commercial and recreational
- **Public utilities**

4.2 Government Directives

As per Section 25 of the Maharashtra Regional and Town Planning (MR&TP) Act, 1966, it is mandatory to prepare an Existing Land Use (ELU) plan as part of the proposed Development Plan (DP) of a city. The State Government, under the provisions of Section 154 of the MR&TP Act, has issued directives regarding the preparation of Development Plans on a GIS-based platform through Government Resolution No. TPS1818/1489/प्र.क्र.303/18/नवि-13 dated 25.01.2019, followed by subsequent resolutions dated 17.06.2019, 12.06.2020, 20.06.2020, 31.12.2020, and 06.01.2021. Further, compliance with these instructions for GIS-based DPs was emphasized vide Government Resolution No. GIS DP/पुणेविभाग/सहसंपुवि/31 dated 06.01.2021.

These directives outline the required contents of ELU maps, Proposed Land Use (PLU) maps, and DP reports. The adoption of information technology in urban planning facilitates effective implementation of the Development Plan while ensuring that attribute data is readily accessible to the public.

For this purpose, IIC Technologies Ltd., Hyderabad, in consortium with Monarch Surveyors & Engineering Consultants Pvt. Ltd., Pune, was appointed vide Work Order No. DP cell/781 dated 20/02/2019 to conduct the ELU survey for the proposed Development Plan of the newly merged nine villages.

4.3 Preparation of Base Map

Preparation of Geo referenced base map is essential for preparation of GIS based Existing Land Use map. The ELU map shall be prepared with an overlay of various survey maps on the base map prepared in GIS. Thus, the base map provides the GIS platform with geo-referenced data for preparation of ELU maps. GIS provides the ability to integrate and display maps with geographical data and attribute data from various sources to provide the information necessary for effective decision making. It can generate simple land use maps and perform spatial analysis based on its capability of retrieving data and map overlays. On the whole it also can be used for information retrieval, development control, mapping, site selection, land use planning, land suitability analysis, programming and monitoring.

4.3.1 Ground Control

A ground control network is carried out using dual frequency Global Navigation Satellite System (GNSS)/ Global Positioning System (GPS) in static mode. The static GPS technique is used in GPS survey positioning. It has involvement of multiple receivers to build strong networks of points that facilitate the use of Least Square Adjustment techniques to provide extremely accurate positioning. The static survey also involved two or more receivers which collect data on different points for a sufficient amount of common time in order to resolve the vectors between them to the centimeter level. The map projection and coordinates of the control points is in UTM grid and WGS 84 datum and MSL datum.

4.3.2 Creation of Geo Referenced Land Record System

For preparation of base map revenue records (Tipan, Phalani, Akarband, Gat book etc.) were availed from Revenue Department. While finalising Survey Number boundaries, Tipan is used as primary base, while the Phalani, Gat book and Measurement plans used for Land Acquisition are taken as reference. Where such information is not available, Village Map is considered as a reference.

The records are properly decoded, digitized and brought to proper scale. As stipulated in the GRs mentioned earlier, cadastre maps, village maps, city survey sheets, TPS sheets, sanctioned layouts from competent authorities were referred while preparing ELU map.

4.4 Preparation of Existing Land Use Map

Electronic Total Station survey was carried out in the planning area recording existing features such as roads, service lines, transmission towers, compound walls, fences, plots, structures, water bodies, trees, bunds, footpaths, dividers, wells, etc. ELU map was prepared with an overlay of survey details on base maps prepared in GIS, as per respective GRs.

Incorporation of Data

The primary and secondary data is collected and analysed as per details given in Chapter 3 for preparation of DP. Data incorporated in ELU map, consists of data regarding existing land use with building footprints/ structure outlines, geographical features, administrative boundaries like Municipal limit boundaries, planning area boundary, Revenue survey

number boundaries, data collected through total station survey and water bodies survey, attributes for existing features, petrol line, contours, high tension lines, transmission towers, railway track, weirs, streams, bridges and culverts, etc. Also Integrated Township Projects, sanctioned layouts and individual sanctions by competent authorities are earmarked on ELU maps. Data provided by various Govt. departments regarding their existing set-up, including services being provided by them are duly shown in ELU map. Due cognizance was taken of the existing and proposed Regional Plan/ Development plan roads, in the adjoining area of the planning area boundary. ELU map shows land parcels under the use of Agricultural, Commercial, Defence, Forest, Green Belt, Hill Top Hill Slope, Public Utility, Water Bodies, Industrial, Mixed, Public-Semi Public, Vacant, Recreational, Residential, Traffic & Transport.

4.5 Challenges in Preparation of Existing Land Use (ELU) Map and Solutions Derived

As mentioned earlier, available Land Revenue records were referred while preparing ELU map. Difficulties encountered regarding these land records are listed below-

- i) Discrepancies between different land records viz. Village Maps, Tipan, Phalani, Demarcation of individual properties, Acquisition maps, etc. regarding area, shape, location of land parcels were observed in large no. of cases.
- ii) Some survey numbers not included in village maps were mentioned in other land records.
- iii) Records of Government Lands like ownership documents, demarcation, etc. were not available in spite of rigorous follow up with the concerned authorities.
- iv) Village boundaries of adjacent villages were found to be mismatching as shown in separate village maps of different villages, creating discrepancies in the common boundaries of different planning areas having different planning authorities.
- v) Boundaries of land under nalla / water streams, canals and village roads as per ELU surveys and those shown on village maps deviated in most of the cases.
- vi) Identification of revenue boundaries on field in absence of defining markings (Stones/ “Chira” erected as a mark of S No Boundary) was found difficult.
- vii) Boundaries in revenue records and actual boundaries of sanctioned development, did not match in some cases.

Office of the Settlement Commissioner and Director of Land Records, Pune was approached for authentic information regarding discrepancies in land records. Revenue records of ownership/ title were referred for earmarking Govt. lands on ELU map. In case of discrepancies in different land records, individual demarcation, Phalani, Tipan and Village Map were referred in that order, to arrive at actual details of the land parcel. The other Planning Authorities were consulted to rectify the discrepancies in planning areas common boundaries. Stringent of the widths of land under nalla/water streams, canals and village roads collected through existing land use survey and that shown on village maps were shown on ELU map.

4.6 Types of Land Use in Planning Area

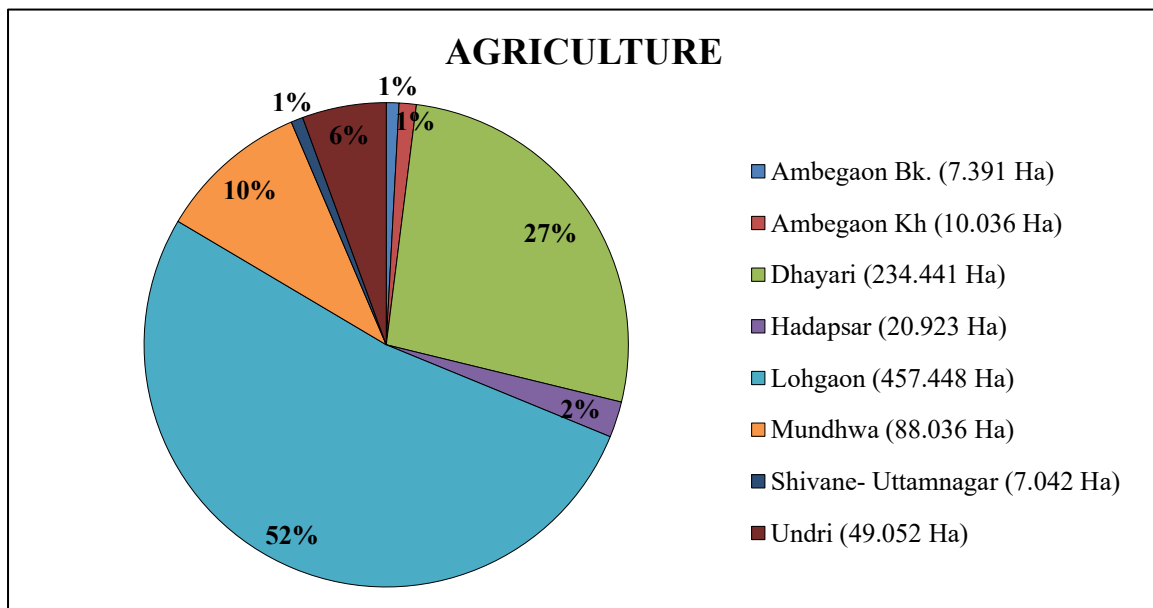
Land use can be defined as utilization of a land parcel at the given time. Main types of land use observed are residential, agricultural, commercial, defence, forest, industrial, mines & quarries, public semi-public, recreational, services, water bodies, traffic and transportation, etc. The nine villages in the planning area show peri-urban characteristics with less

agricultural land use than earlier, sporadic growth of industries, haphazard residential growth mainly along existing roads. Details of land uses observed in nine villages are described here below;

4.6.1 Agriculture

Peripheral area of the planning area, located away from the city, is dominated by agricultural use. Total area under agriculture is 874.37 ha (15.56% of the planning area). Lohgaon has a maximum 52.32% of the entire agriculture area of nine villages.

Figure 4.1 Agriculture land use distribution



4.6.2 Commercial

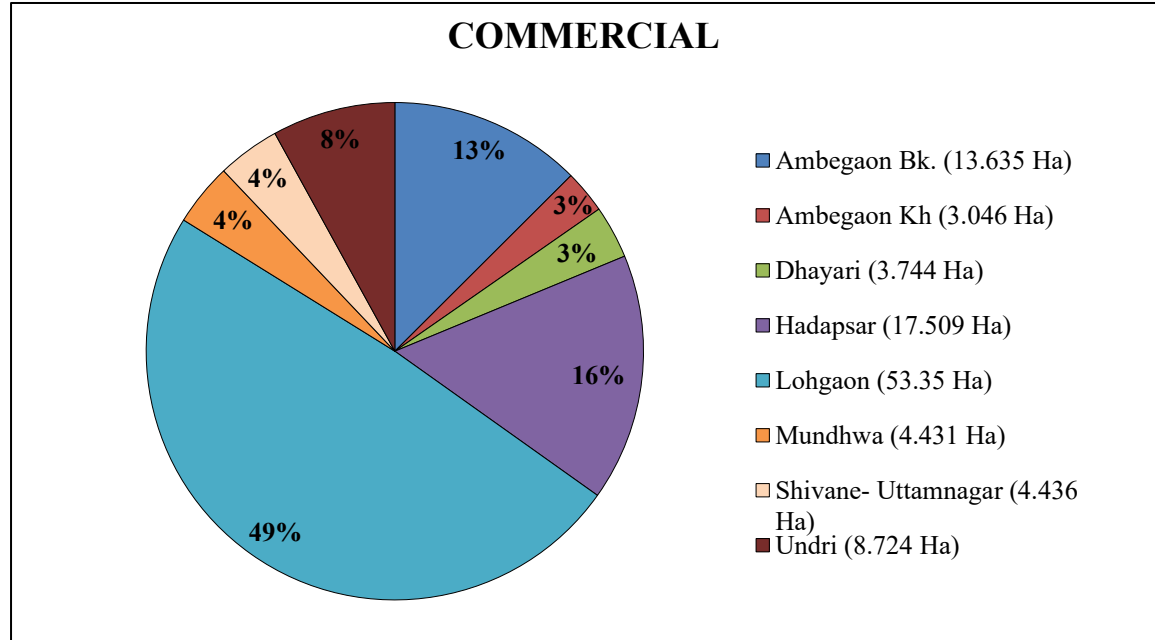
Land uses that include retail shopping, markets and general business (e.g. Convenience/ retail shop, mall, wholesale shops, APMC, pavement hawkers, hotels, motels, restaurants, category hotels, banks, showrooms, cinema/ theatre/ multiplexes, market, marriage hall, service centers, petrol pump, etc.) have been classified as commercial use.

Figure 4.2 APMC- Shivane Uttamnagar



Total commercial land use accounts for 108.875 Ha, which is 1.94% of the planning area. Out of nine villages, village Lohgaon has a maximum 53.35 ha commercial area, which is 49.00% of the entire commercial area of the planning area.

Figure 4.3 Commercial land use distribution



4.6.3 Defence

Defence establishment is in two villages viz Shivane and Lohgaon. The National Defence Academy (NDA), the first tri-service academy in the world, is located in Shivane measuring an area of 559.75 ha. Lohgaon has 19.57 ha of land under defence. Adding these together, Defence land use is 579.32 ha which is 10.32% of the entire planning area.

4.6.4 Forest

Figure 4.4 Forest land- Dhayari



Area under forest is 209.402 Ha, (188.343 ha in Dhayari, 16.11ha in Lohgaon and 4.948 in Hadapsar) which accounts for 3.73 % of the planning area.

4.6.5 Green Belt

Green belts earmarked are mainly along the river banks and work as protection belts for natural flowing water bodies. Green belts were shown in the Regional Plan (RP) in some parts of village Shivane, Shivane-Uttama Nagar and Mundhwa, along the river banks. Few layouts were sanctioned with green belt on some portion of the land parcel, as per RP. These areas marked under green belt in RP are shown as Green Belt in ELU, with an area of 5.518 Ha, 0.1% of planning area.

Figure 4.5 Green belt along river Mutha at Shivane



4.6.6 HTHS

HTHS land use is identified over hilly parts of the planning area, having slope more than 1:5. Total area under HTHS is 473.536 ha, (219.166 ha in Ambegaon Bk and Ambegaon Kh, 252.60 ha in Dhayari) which accounts for 8.43% of total planning area.

Figure 4.6 Hilly region - Dhayari



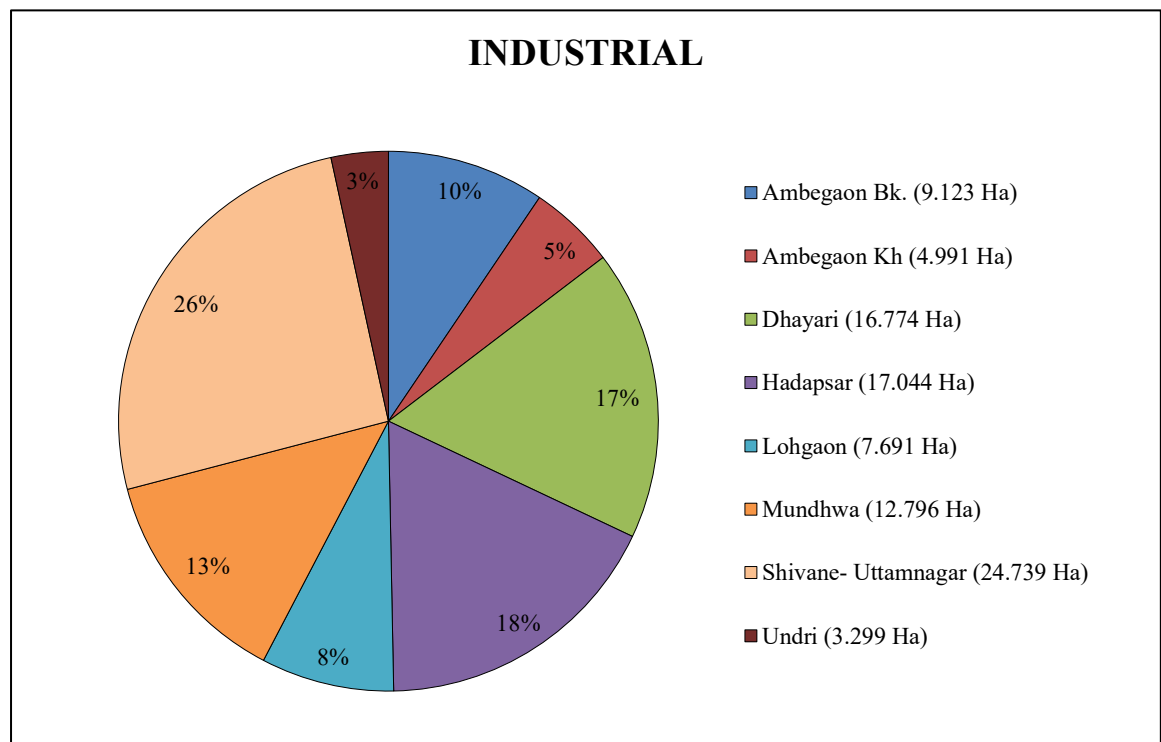
4.6.7 Industrial

Land under small scale, medium scale, large scale, cottage industries producing various products like Rubber/ Plastic, Metal, Food products, Beverages, Textile, Engineering Products, paper products, IT industry, Brick/block Kiln, Industrial go-downs, etc. is considered as industrial land use. Total area of industrial land use is 96.457 Ha, which accounts for 1.72% of planning area. Out of nine villages, Shivane-Uttam Nagar has the maximum 25.65% of the entire industrial area.

Figure 4.7 Industrial units- Dhayari



Figure 4.8 Industrial land use distribution



4.6.8 Mixed Use

More than one land use in a single land parcel as defined in the Govt. Resolution No. GIS DP/पुणेविभाग/सहसंपुवि/31 Dated 06.01.2021 is considered as mixed land use. Common mixed land uses in nine villages are Residential + Commercial and Commercial + Industrial.

Mixed land use is 1.64% of the planning area with an area of 91.841 ha. Highest mixed land use is observed in Lohgaon with an area of 34.06 ha, i.e. 37.08% of total mixed land use in the planning area.

Figure 4.9 Structure serving for multiple uses: Shivane

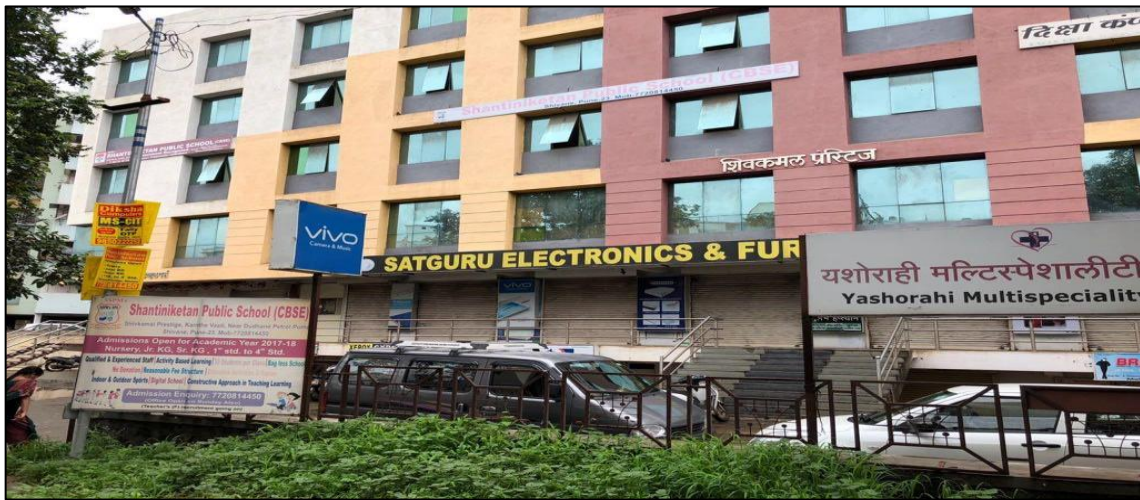
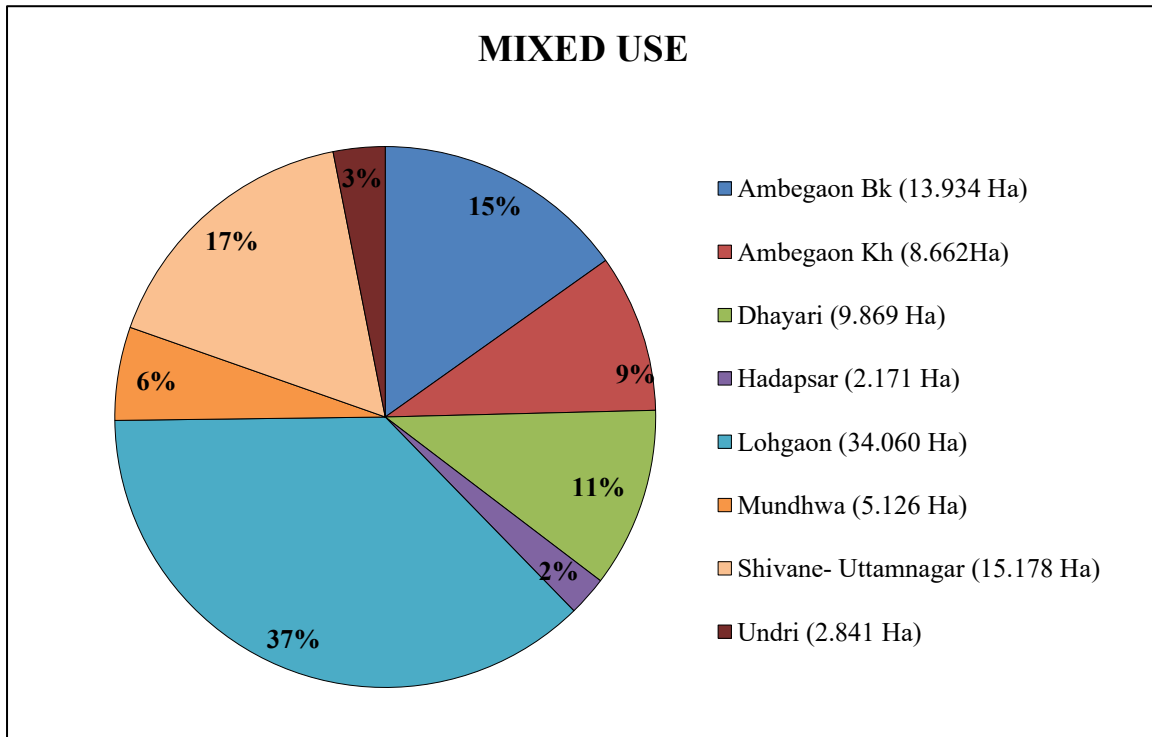


Figure 4.10 Mixed land use distribution



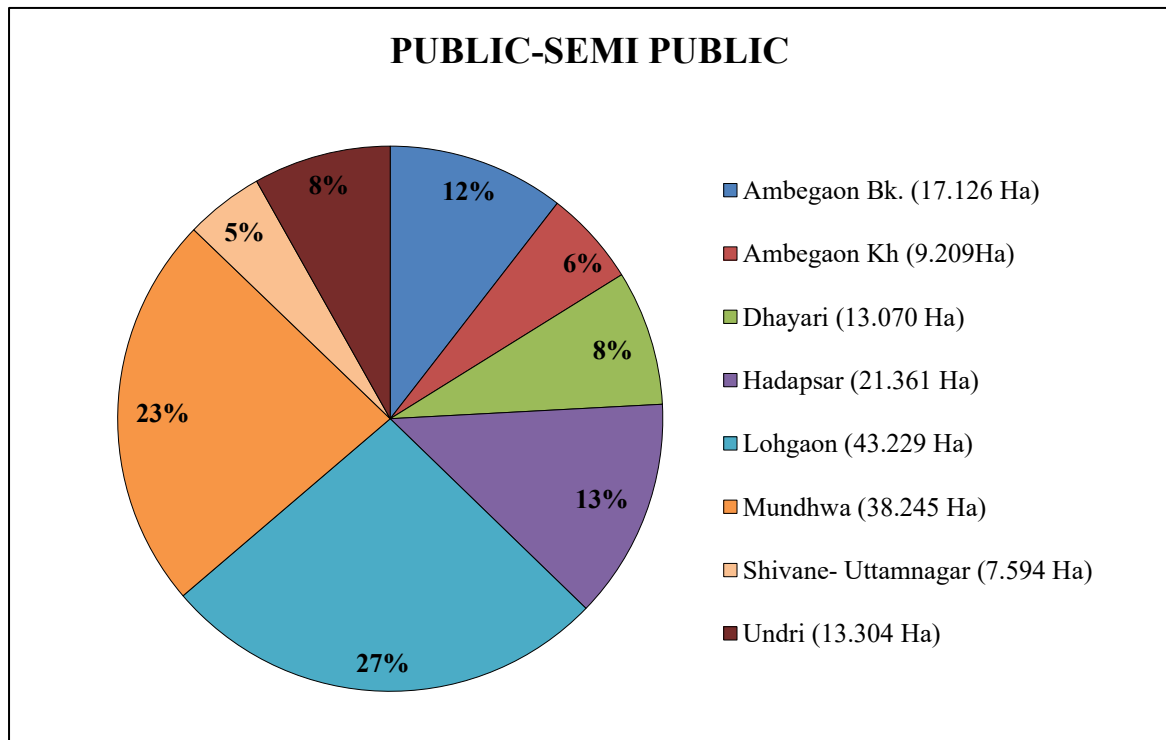
4.6.9 Public-Semi Public

Public-Semi Public consists of Primary Health Centre, Dispensary, Hospital, Religious places, Govt./Semi Govt. Office, Nursery school, Primary School, Secondary School, College, Medical Institute, University, Library, Meditation Hall, community halls, Auditorium, Police Station, Lands marked for PSP use in approved layouts etc. The total area under Public Semi Public is 163.138 ha, which accounts for 2.91% of planning area. Out of nine villages, village Lohgaon has a maximum area under Public Semi Public use 26.50% of the entire public semi public area.

Figure 4.11 Educational campus- Ambegaon Budruk



Figure 4.12 Public-semi public land use distribution



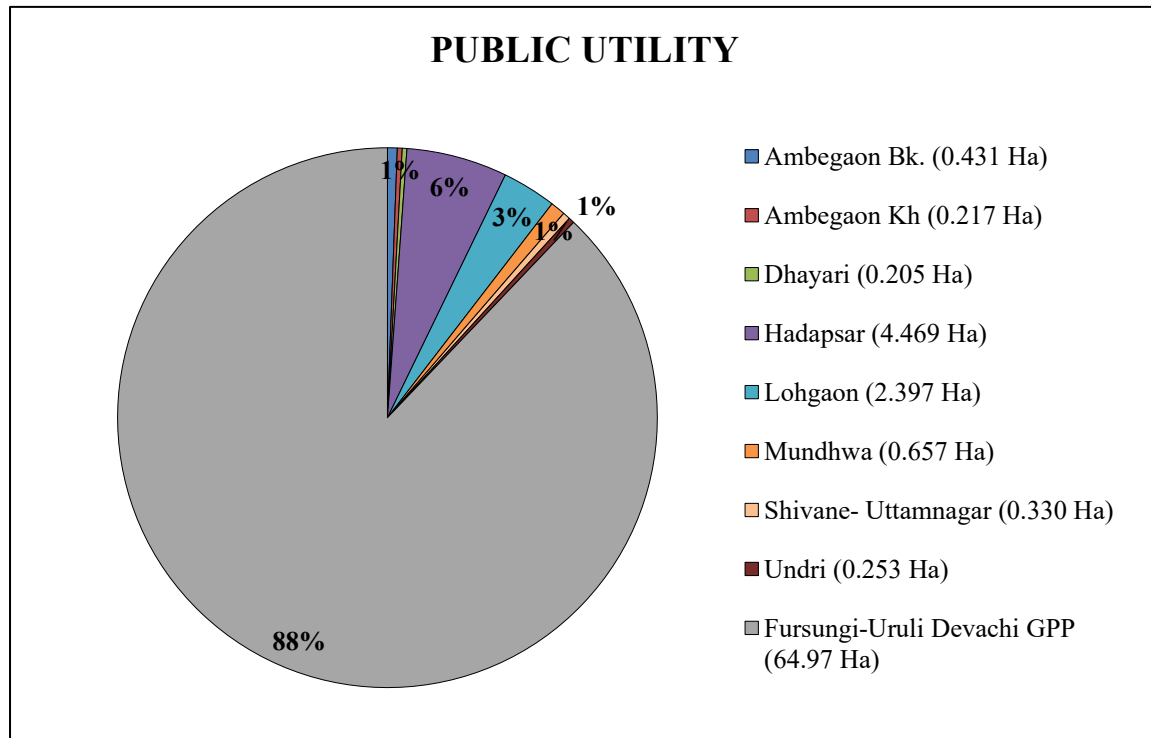
4.6.10 Public Utility

Public Utilities like Water / Sewage treatment Plant, Overhead / Ground Water Tank, Garbage disposal site, Burial Ground, Cremation ground, Public Toilet, Fire Brigade, Post office, etc. are marked under this category.

Figure 4.13 Water treatment plant located at Shivane-Uttamnagar



Figure 4.14 Public utility land use distribution



The area utilized for Public Utilities is 73.929 ha i.e. 1.32% of the Planning area. PMC's Garbage Processing Plant at Fursungi and Uruli devachi, has a maximum services area 87.9% of the entire of the planning area.

4.6.11 Recreational

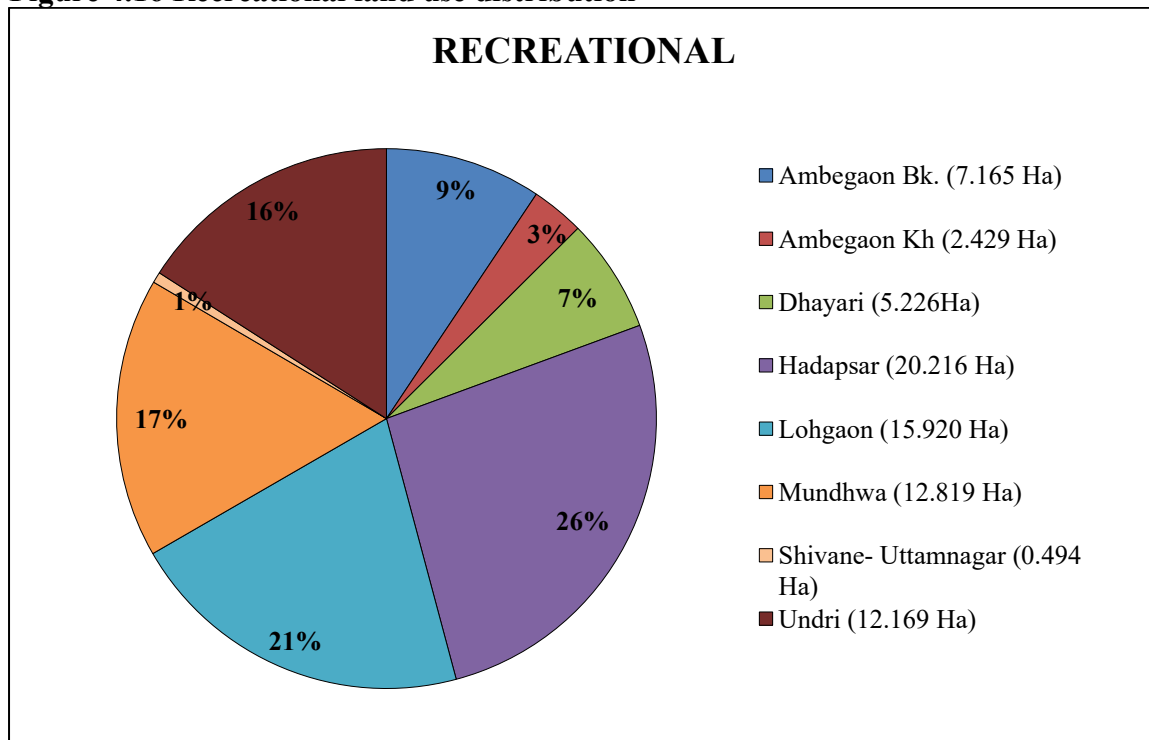
Playground, garden, parks, green belt, open spaces of layouts, stadium, amusement park etc. are considered under recreational facilities.

Total area under Recreational facilities is 76.438 ha which is 1.36% of planning area. Owing to the remarkable recreational area in Amanora township, Hadapsar has maximum recreational area 20.2 ha which is 26.43 % of the entire recreational area of the planning area.

Figure 4.15 Recreational Facilities - Amanora Township, Hadapsar



Figure 4.16 Recreational land use distribution



4.6.12 Residential

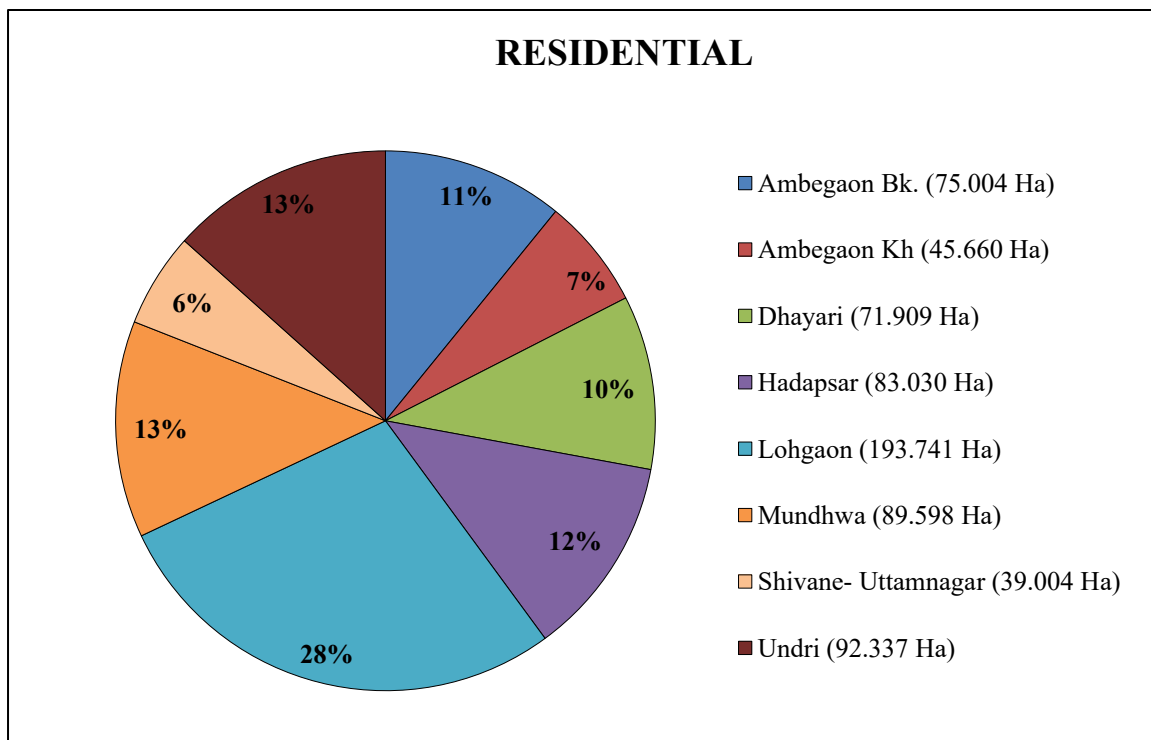
Land which has Residential units namely chawls, apartments, bungalows, row houses, huts, small individual houses, wadas, hostels, approved layouts of residential buildings, etc. is included under residential land use.

Total residential land use within the planning area is 690.823 ha (12.29 % of the total planning area). Out of nine villages, village Lohgaon has the maximum 28.07 % of the entire residential area of the planning area.

Figure 4.17 Residential development - Ambegaon khurd



Figure 4.18 Residential land use distribution



4.6.13 Traffic and Transportation

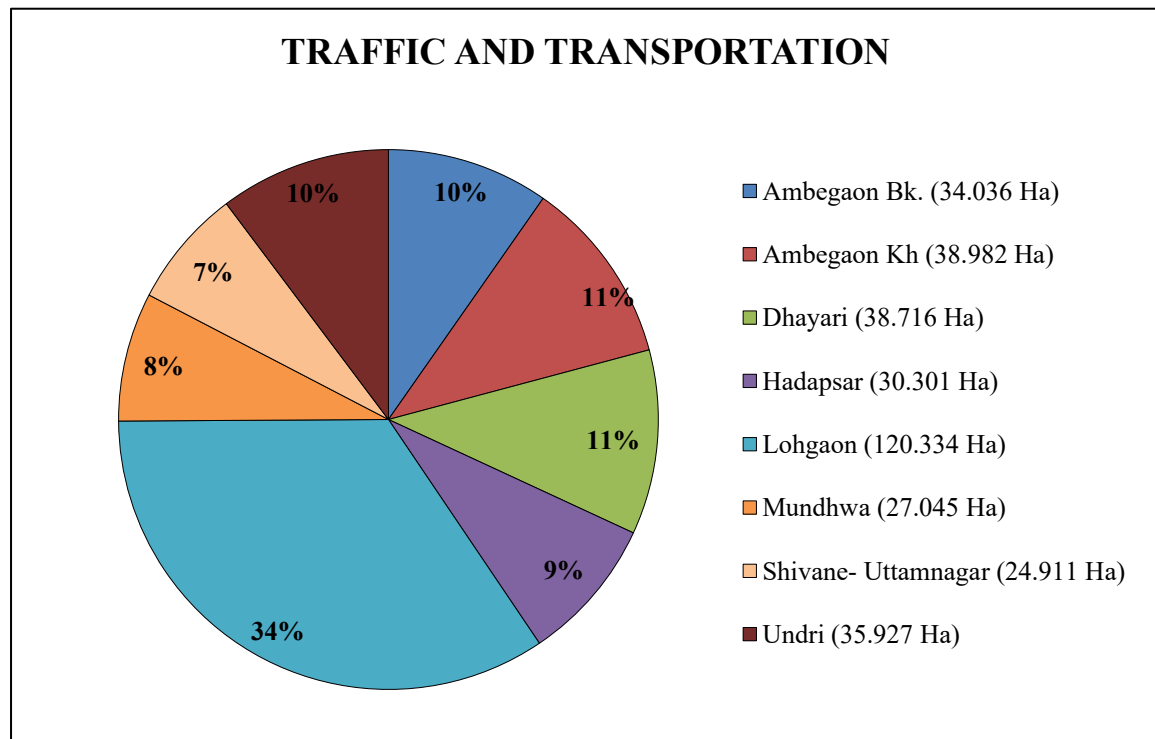
Roads, Railway tracks, Railway stations, Railway Goods yard, Container Depot, Truck Terminal, Bus depots, Rickshaw stand, Parking plaza, Taxi stand, etc. are marked under Traffic and Transportation land use.

Figure 4.19 E-bus depot



The total area under Traffic and Transportation is 350.252 ha. This accounts for 6.24% of the planning area. Out of nine villages, village Lohgaon have a maximum 34.36 % each of the entire traffic and transportation area of the planning area.

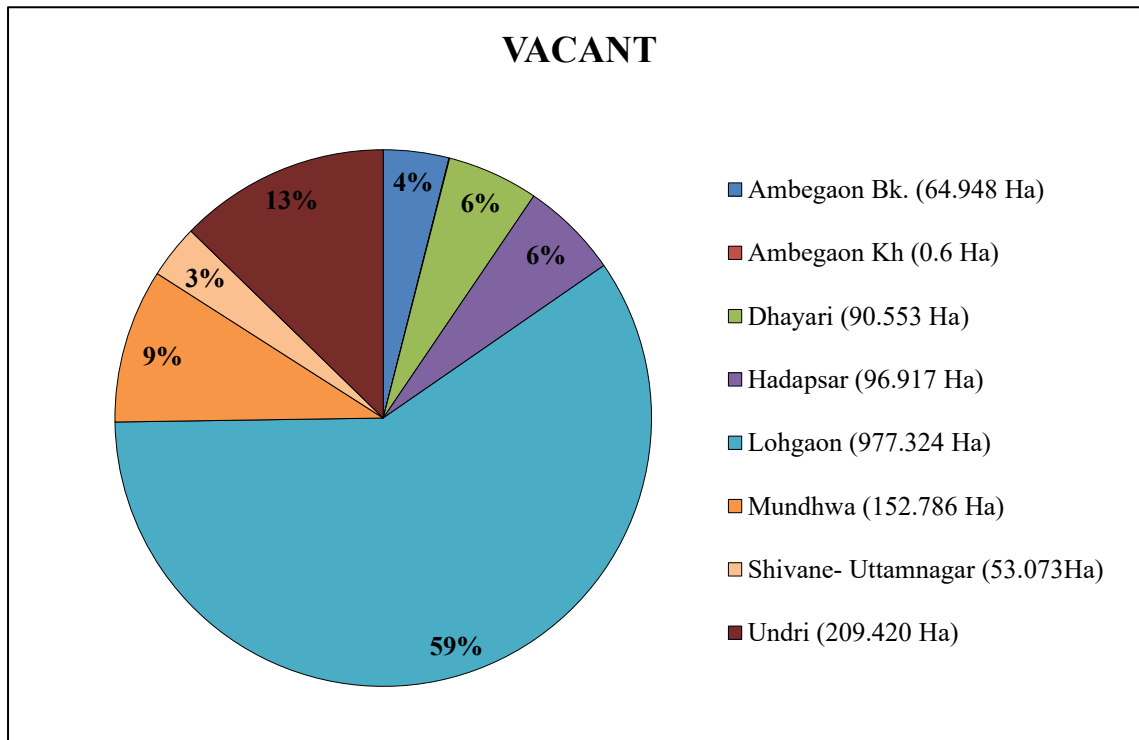
Figure 4.20 Traffic and transportation land use distribution



4.6.14 Vacant

Unoccupied and unused and/or having no structures on it is considered to be vacant land. Area under vacant land is maximum amongst all land uses in nine villages which is 1645.621 ha (29.29%). Lohgaon holds the highest vacant area i.e. 59.4% of total vacant area.

Figure 4.21 Vacant land use distribution



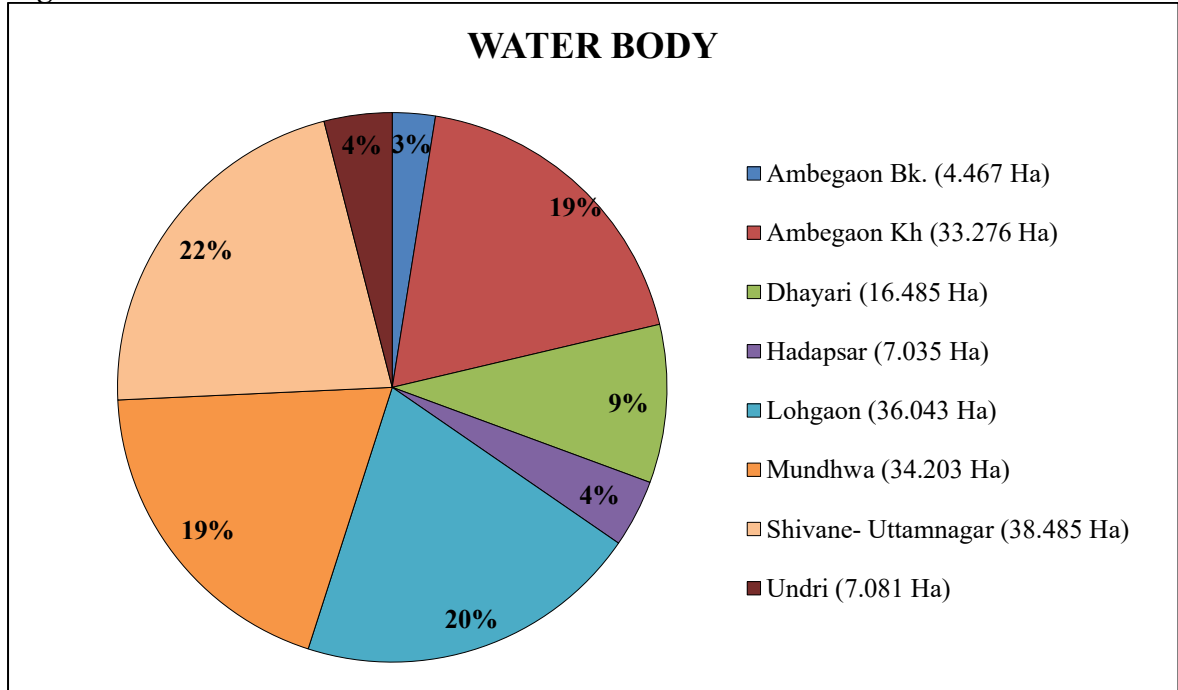
4.6.15 Water Bodies

Natural (River, lake, Ponds, nalla etc.) and Anthropogenic (Canal, Reservoir, Well etc.), are recorded as water bodies in the ELU Map of planning area. The total area covered by water bodies in the planning area is 177.075 Ha, which is 3.15%. Shivane -Uttamnagar has a maximum 21.73% of water body w.r.t the entire area under water bodies in the planning area.

Figure 4.22 Jambhulwadi lake- Ambegaon Khurd



Figure 4.23 Water bodies land use distribution



The division of various land uses in the planning area is as follows

Figure 4.24 Existing land use distribution of all nine villages

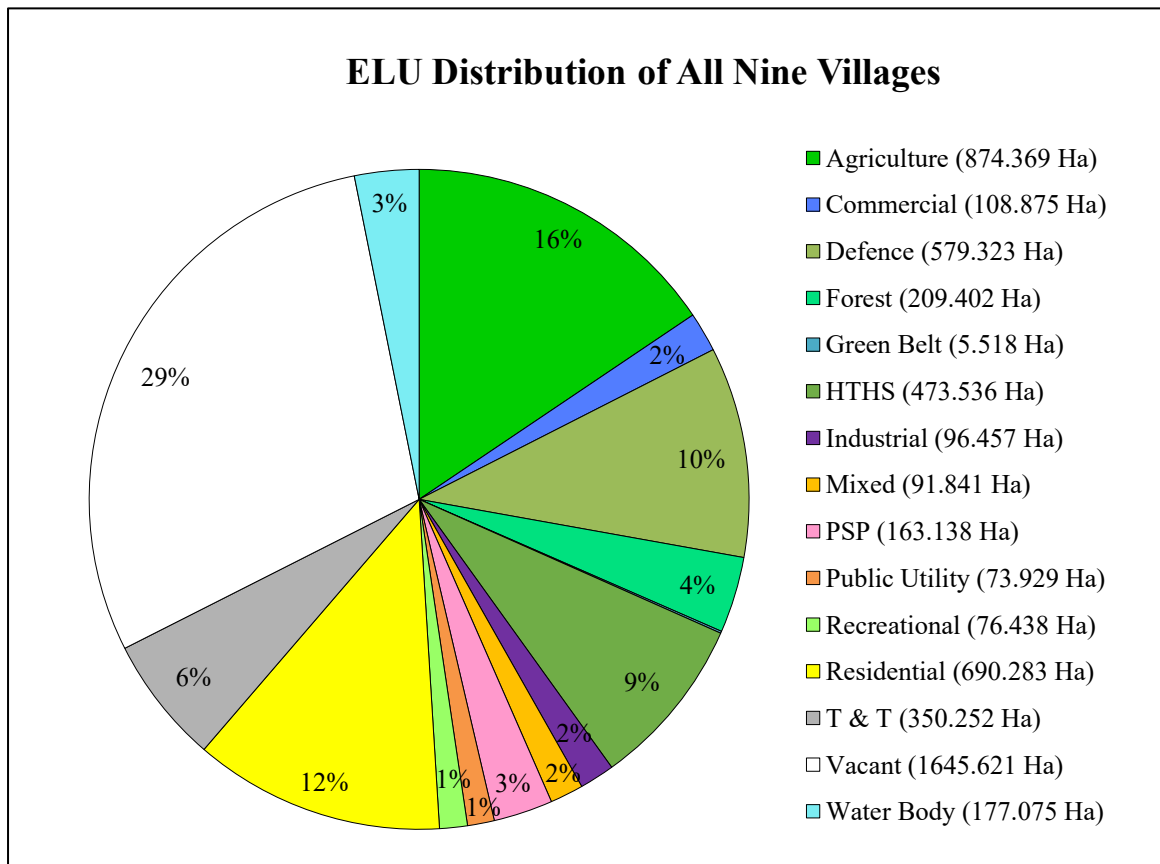


Table 4.1 Village-wise land use distribution (area in hectares)

Village	Ambegaon Bk.	Ambegaon Kh.	Dhayari	Hadapsar	Lohgaon	Mundhwa	Shivane-Uttam Nagar	Undri	Fursungi and Uruli GPP	Total	% of Total Area
Agriculture	7.391	10.036	234.441	20.923	457.448	88.036	7.042	49.052	0.000	874.369	15.56
Commercial	13.635	3.046	3.744	17.509	53.350	4.431	4.436	8.724	0.000	108.875	1.94
Defence	0.000	0.000	0.000	0.000	19.573	0.000	559.750	0.000	0.000	579.323	10.32
Forest	0.000	0.000	188.343	4.948	16.111	0.000	0.000	0.000	0.000	209.402	3.73
Green Belt	0.000	0.000	0.000	0.000	0.000	1.366	4.152	0.000	0.000	5.518	0.10
HTHS	0.100	219.066	252.600	0.000	1.770	0.000	0.000	0.000	0.000	473.536	8.43
Industrial	9.123	4.991	16.774	17.044	7.691	12.796	24.739	3.299	0.000	96.457	1.72
Mixed	13.934	8.662	9.869	2.171	34.060	5.126	15.178	2.841	0.000	91.841	1.64
PSP	17.126	9.209	13.070	21.361	43.229	38.245	7.594	13.304	0.000	163.138	2.91
Public Utility	0.431	0.217	0.205	4.469	2.397	0.657	0.330	0.253	64.97	73.929	1.32
Recreational	7.165	2.429	5.226	20.216	15.920	12.819	0.494	12.169	0.000	76.438	1.36
Residential	75.004	45.660	71.909	83.030	193.741	89.598	39.004	92.337	0.000	690.283	12.29
T & T	34.036	38.982	38.716	30.301	120.334	27.045	24.911	35.927	0.000	350.252	6.24
Vacant	64.948	0.6	90.553	96.917	977.324	152.786	53.073	209.420	0.000	1645.621	29.29
Water Body	4.467	33.276	16.485	7.035	36.043	34.203	38.485	7.081	0.000	177.075	3.15
Total	247.360	376.174	941.935	325.924	1,978.991	467.108	779.188	434.407	64.97	5616.057	100

Table 4.2 Existing urbanisation details in the planning area

Sr. No.	Village	Type of Structures										Total No. of Structures
		Residential/Mix Use		Industrial Use		Health Use		Education Use		Other Use		
		No	B/U Area	No	B/U Area	No	B/U Area	No	B/U Area	No	B/U Area	
1	Lohgaon	9159	2294674	66	9535	6	3646	93	74161	3065	870303	12389
2	Mundhwa	3955	1241813	45	44912	7	2421	14	15975	807	672983	4828
3	Hadpsar	2186	1557418	99	95969	3	5243	15	55194	487	606738	2790
4	Undri	2365	1460966	63	15476	1	56.87	24	85449	695	1149576	3148
5	Ambeagon Budruk	2505	2067115	31	15614	2	101	23	105100	778	621450	3339
6	Ambegaon Khurd	3889	976971	82	13143	2	49.93	2	283.13	685	226062	4660
7	Dhayari	3166	1682908	335	148515	1	1907	21	10304	968	481630	4491
8 & 9	Shivne and Shivne-Uttam Nagar	3272	1425069	506	261465	2	1332	26	16602	657	261875	4463
	Total	30497	12706934	1227	604629	24	14756.80	218	363068.13	8142	4890617	40108

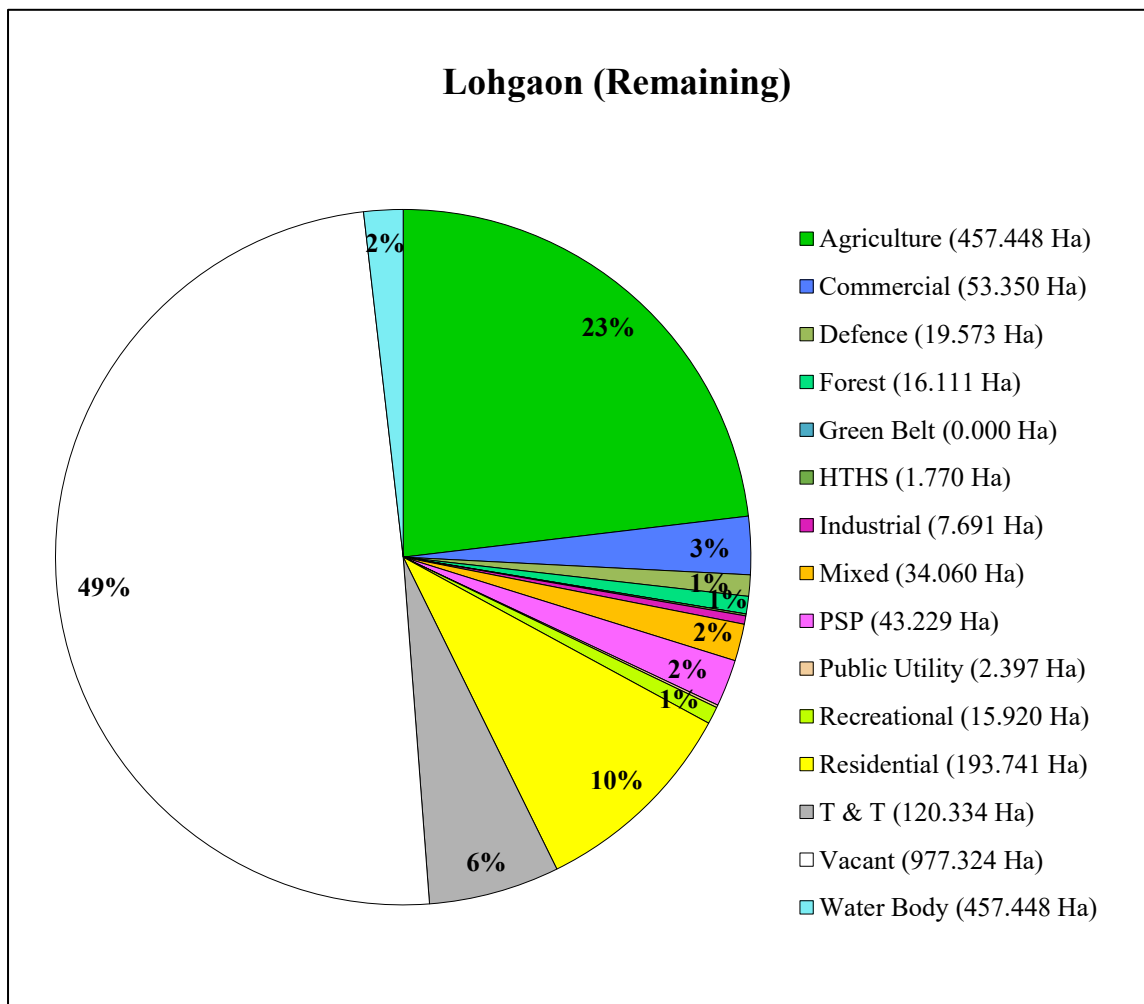
4.7 Village-wise Details of Existing Land Use

Understanding the existing land use pattern of each village is essential while conceptualizing proposals for the Development Plan (DP). It provides insights into growth trends, development characteristics, and potential areas for future expansion. The following charts illustrate the existing land use distribution and features of each of the nine villages within the planning area.

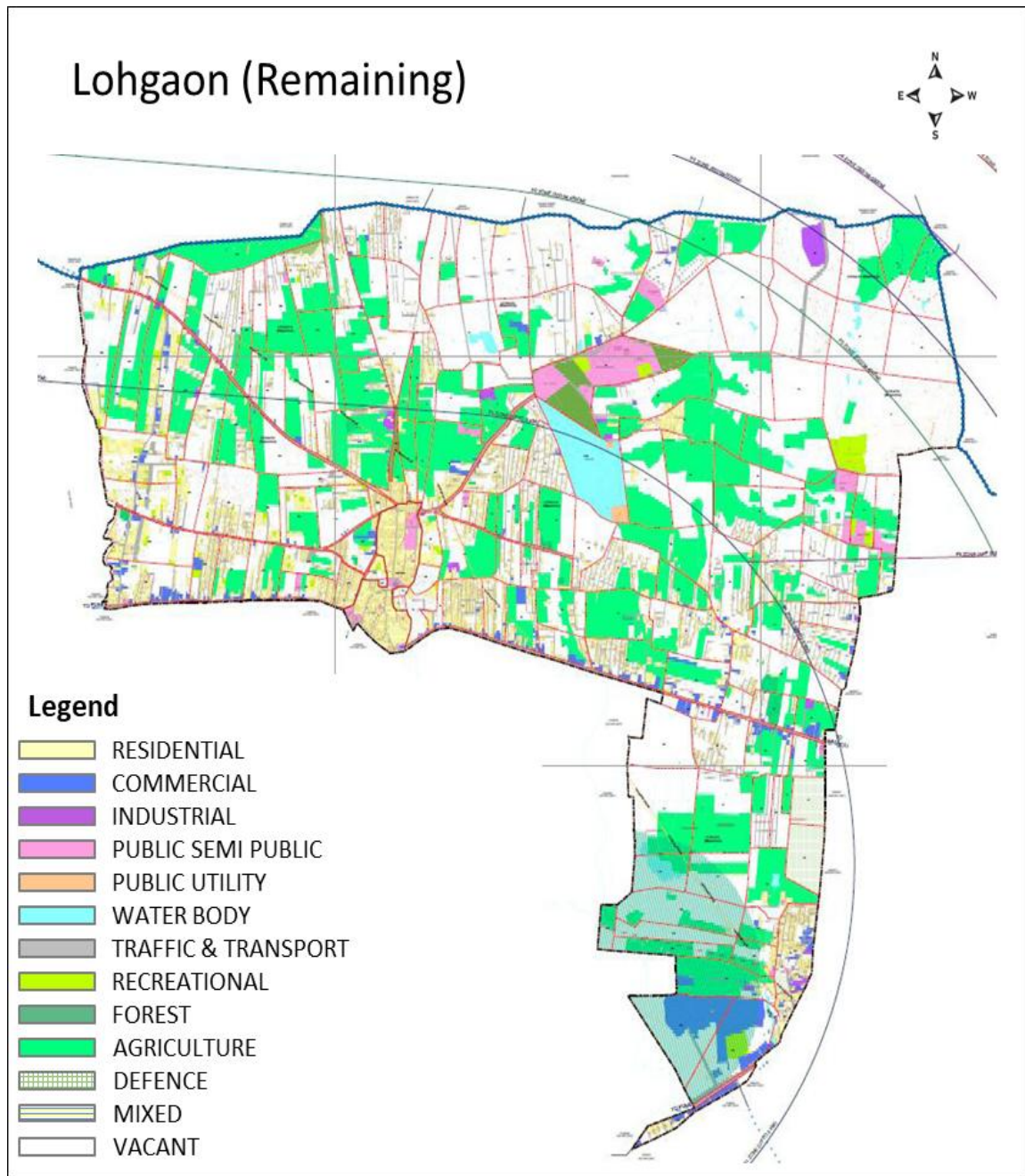
4.7.1 Lohgaon (Remaining)

Land uses listed are Agriculture (457.45 ha), Commercial (53.35 ha), Defence (19.57 ha) Forest (16.11 ha), HTHS (1.77 ha), Industrial (7.69 ha), Mixed (34.06 ha), Public & Semi-Public (43.23 ha), Public Utility (2.4 ha), Recreational (15.92 ha), Residential (193.74 ha), T & T (120.33 ha), Vacant (977.324 ha) and Water Body (36.04 ha).

Figure 4.25 Existing land use distribution of Lohgaon (Remaining)



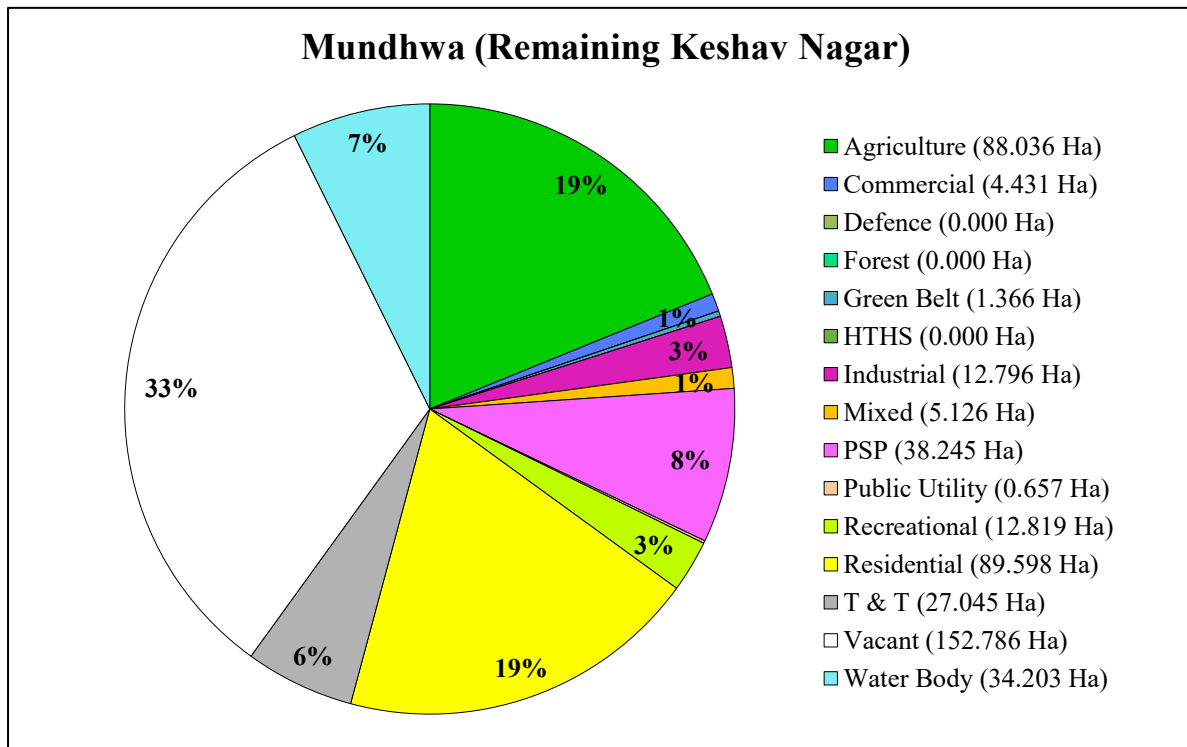
Map 4.1 Existing land use map of Lohgaon (Remaining)



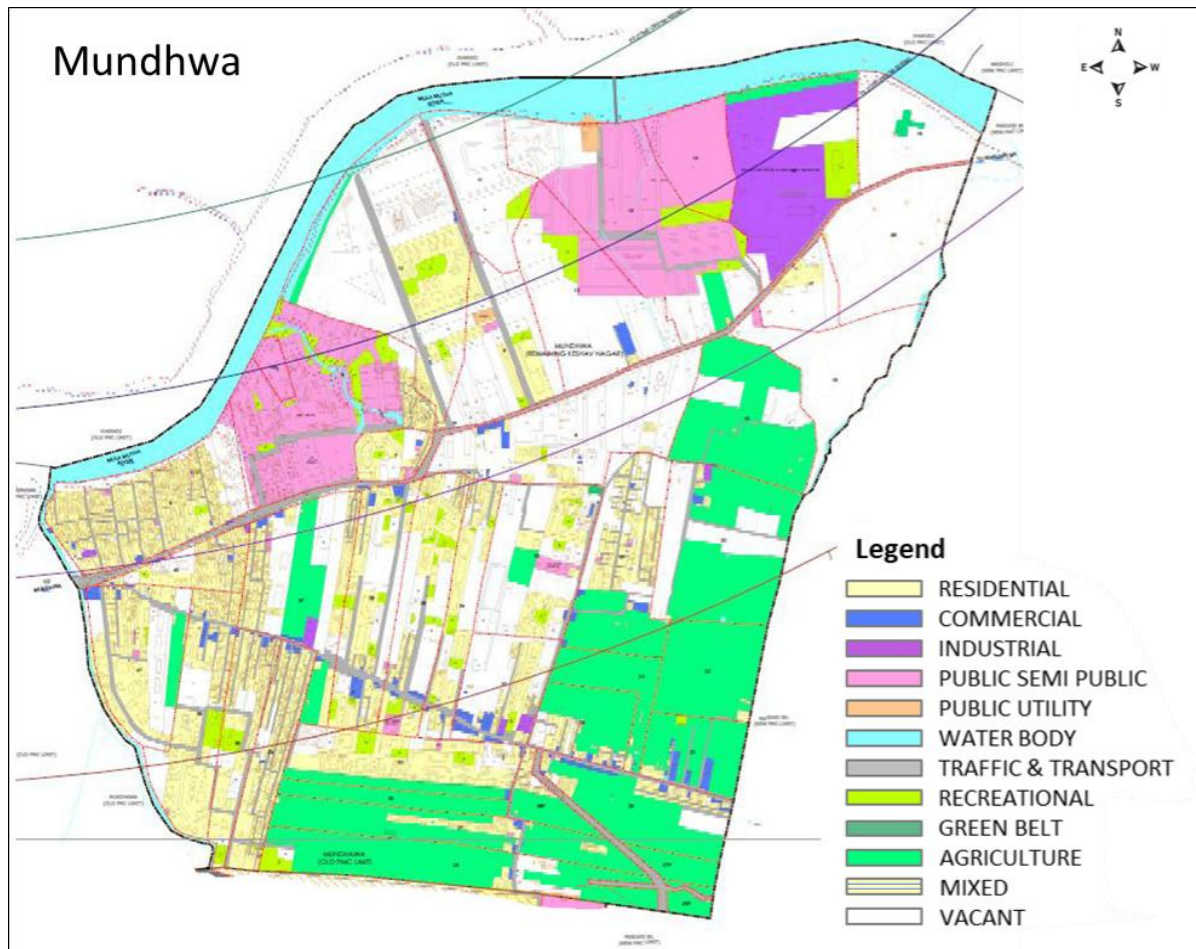
4.7.2 Mundhwa (Remaining Keshav Nagar)

Land uses listed are Agriculture (88.04 ha), Commercial (4.43 ha), Green Belt (1.37 ha), Industrial (12.8 ha), Mixed (5.13 ha), Public & Semi-Public (38.43 ha), Public Utility (0.66 ha), Recreational (12.82 ha), Residential (80.6 ha), T & T (27.05 ha), Vacant (152.786 ha) and Water Body (34.20 ha).

Figure 4.26 Existing land use distribution of Mundhwa (Remaining Keshav Nagar)



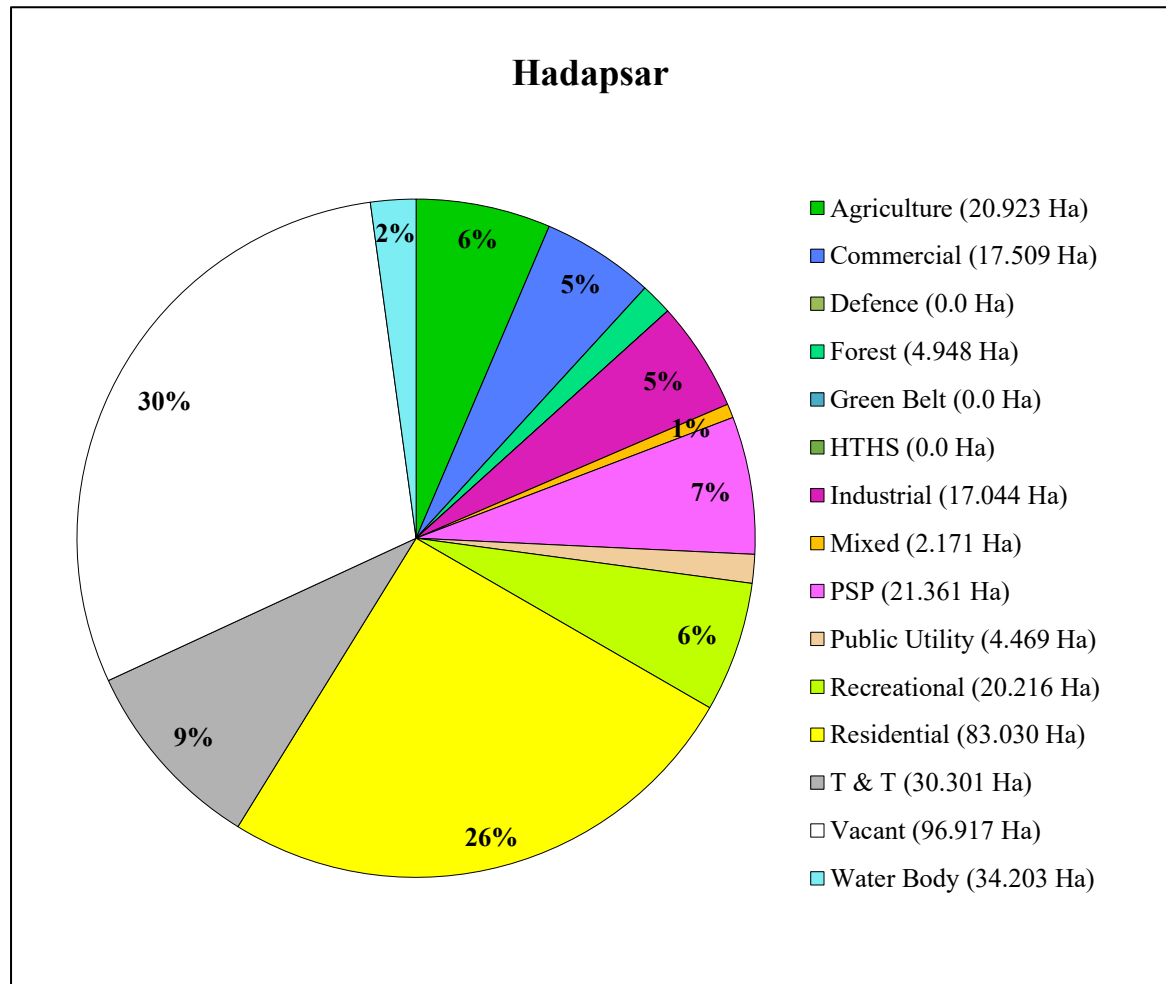
Map 4.2 Existing land use map of Mundhwa



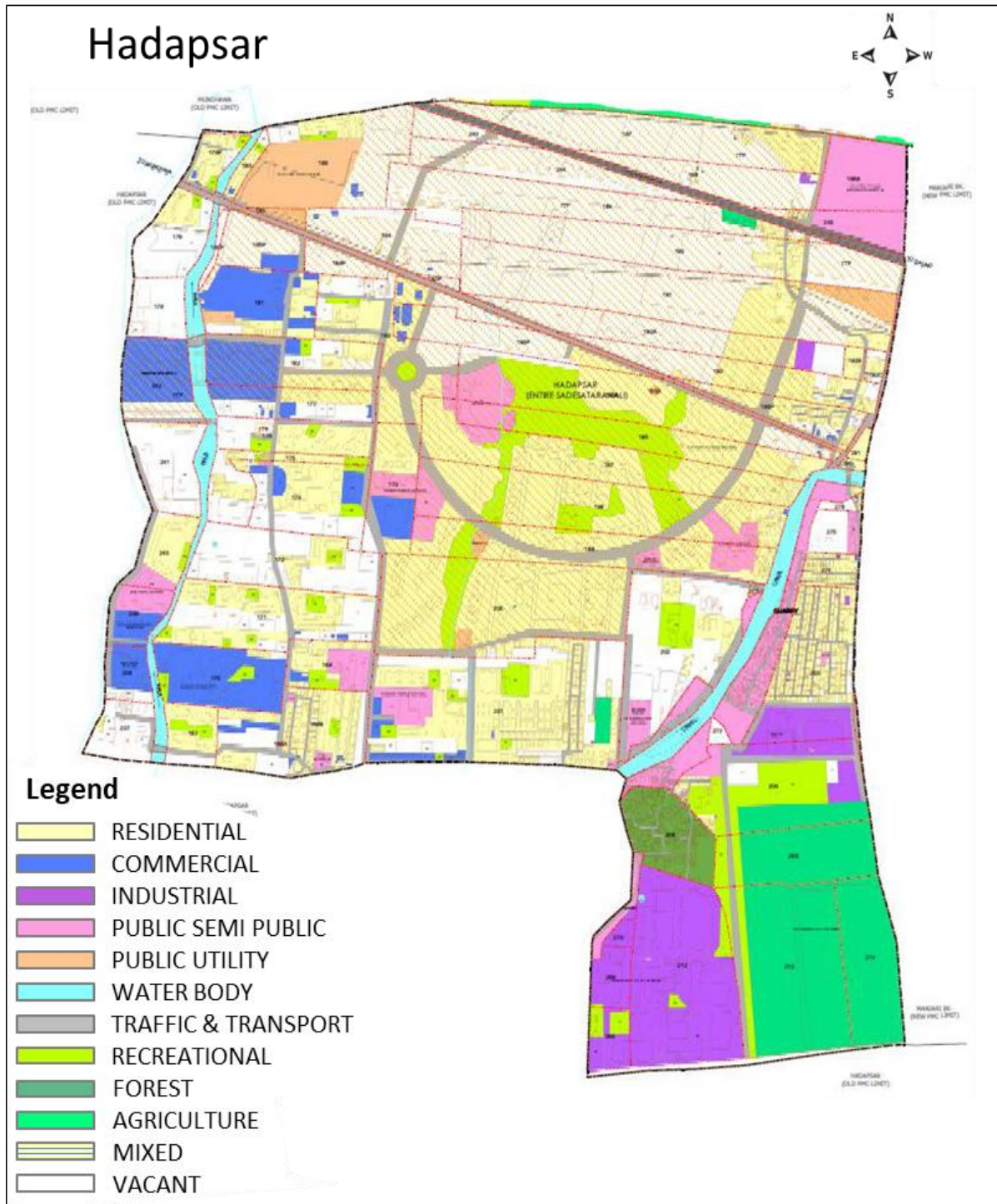
4.7.3 Hadapsar (Entire Sadesatranali)

The village has land uses like Agriculture (20.92 ha), Commercial (17.51ha), Forest (4.95 ha), Industrial (17.04 ha), Mixed (2.17 ha), Public & Semi-Public (21.36 ha), Public Utility (4.47 ha), Recreational (20.22 ha), Residential (83.03 ha), T & T (30.3 ha), Vacant (96.92 ha,) and Water Body (7.04 ha).

Figure 4.27 Existing land use distribution of Hadapsar



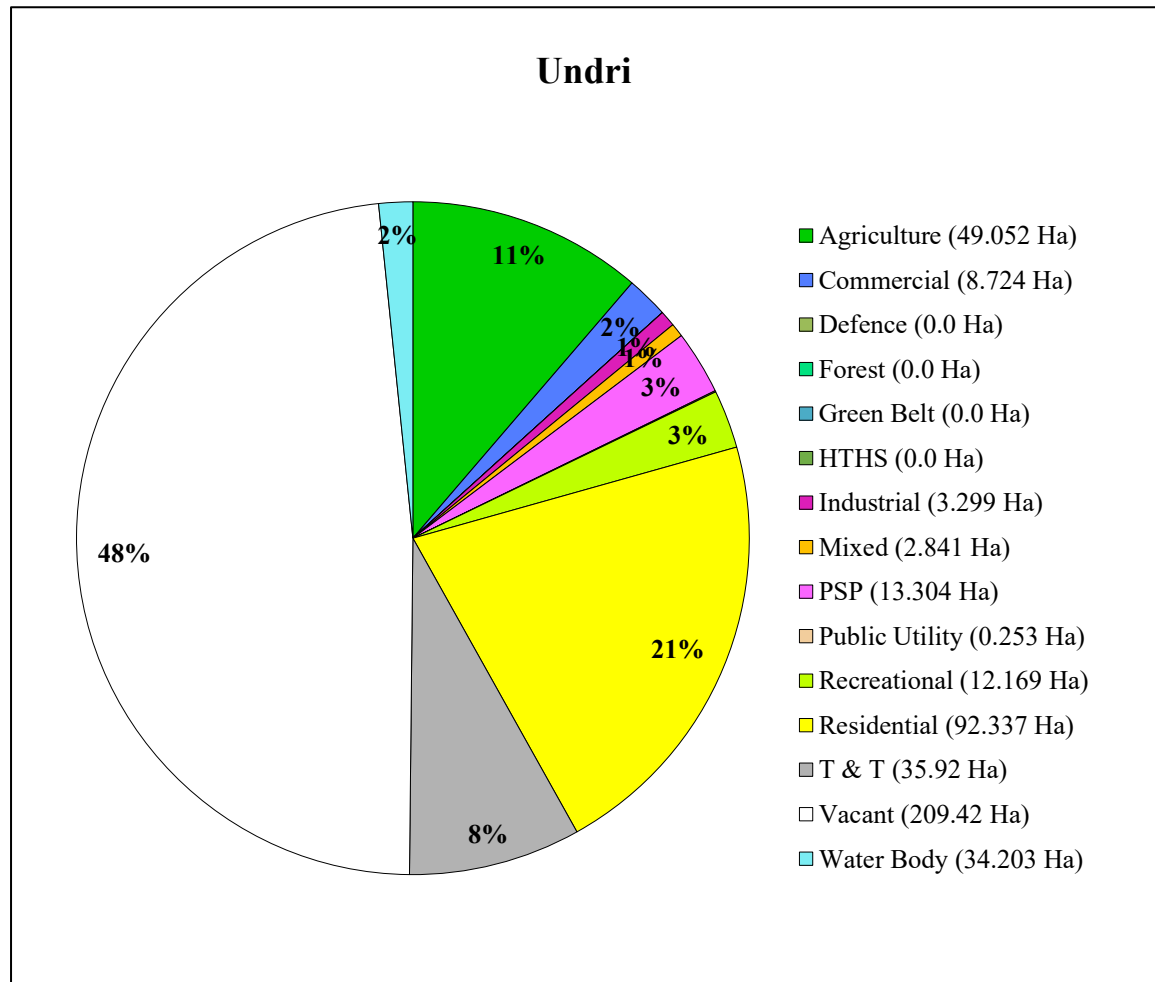
Map 4.3 Existing land use map of Hadapsar



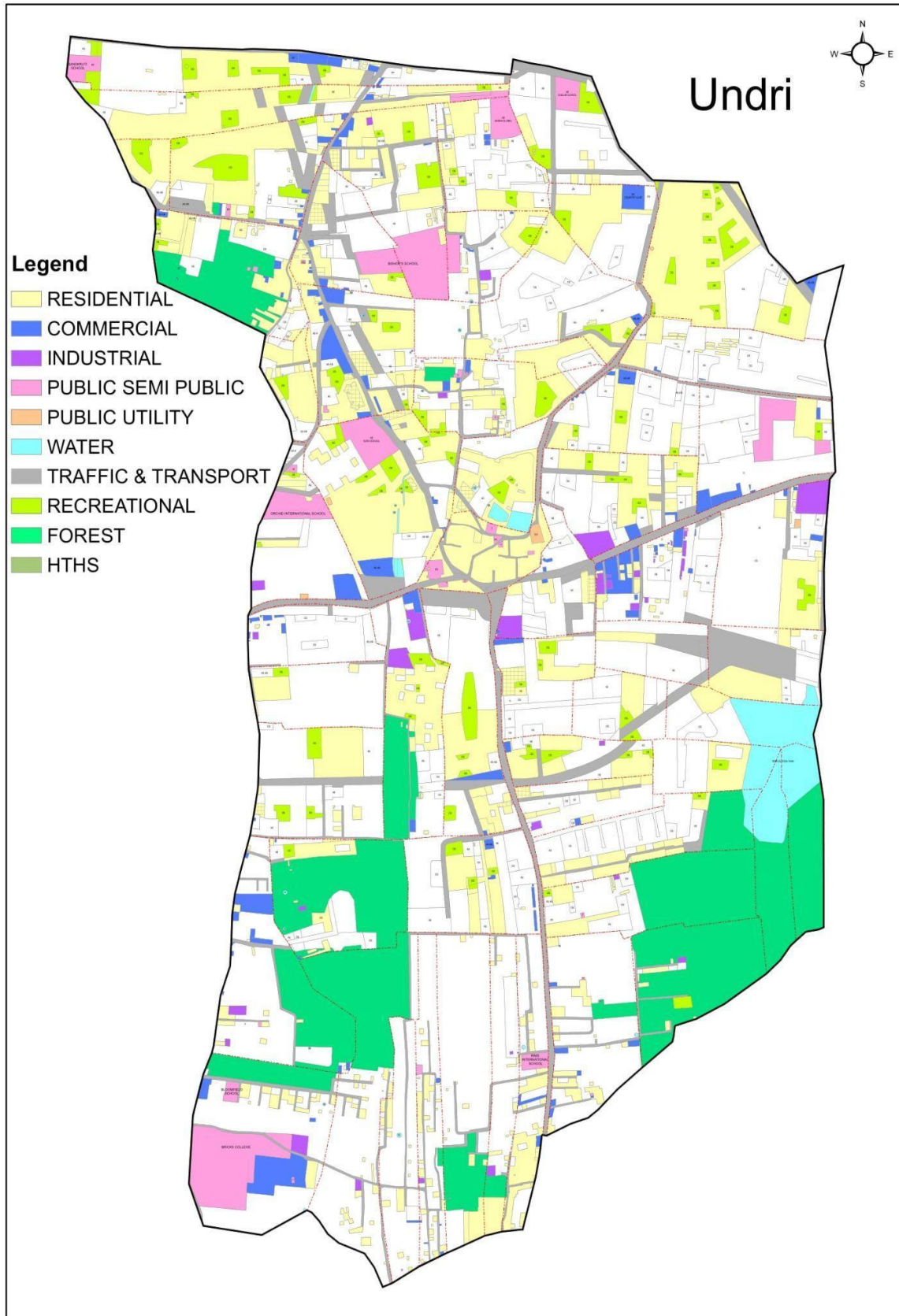
4.7.4 Undri

The village is divided into land uses listed as Agriculture (49.05 ha), Commercial (8.72 ha), Industrial (3.3 ha), Mixed (2.84 ha), Public & Semi-Public (13.3 ha), Public Utility (0.25 ha), Recreational (12.17 ha), Residential (92.34 ha), T & T (35.93 ha), Vacant (209.42 ha,) and Water Body (7.08 ha).

Figure 4.28 Existing land use distribution of Undri



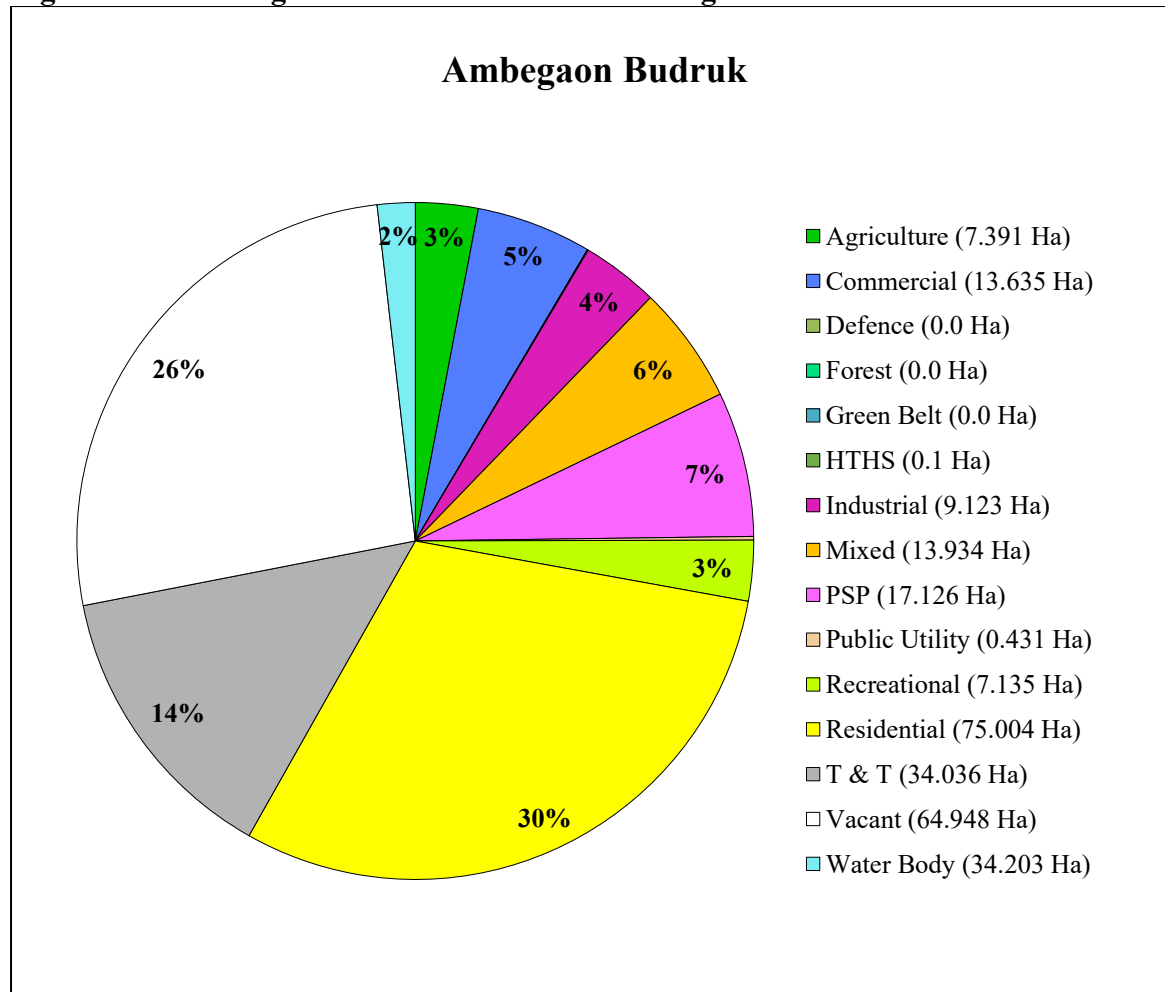
Map 4.4 Existing land use map of Undri



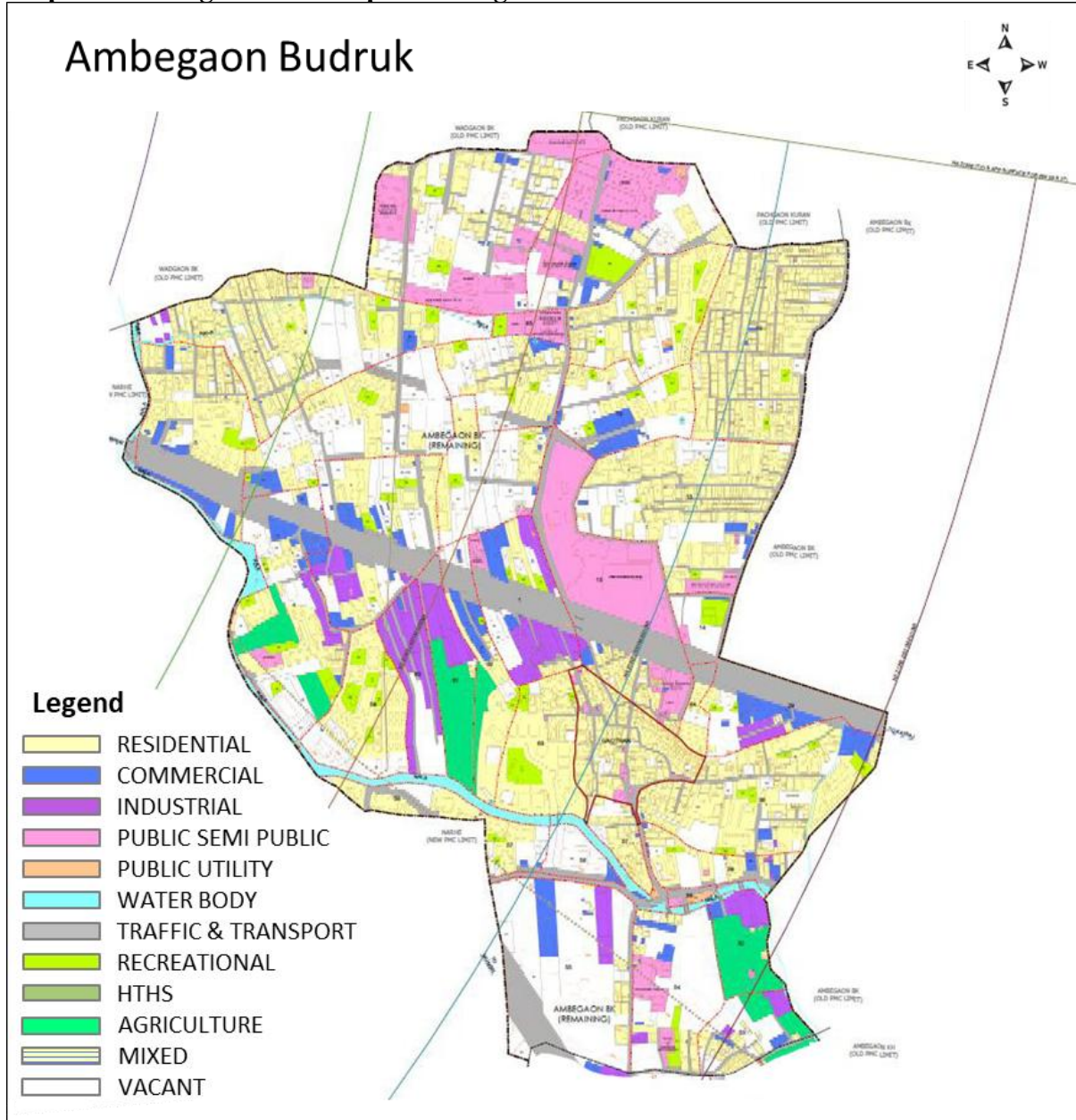
4.7.5 Ambegaon Budruk

The village is divided into land uses listed as Agriculture (7.391 Ha), Commercial (13.635 ha), HTHS (0.100 Ha, 0.04% which is lowest in the village), Industrial (9.123 Ha), Mixed (13.934 ha), Public & Semi-Public (17.126 ha), Public Utility (0.431 ha), Recreational (7.216 ha,), Residential (75.004 ha, 30.32% which is highest in the village), T & T (34.0366 ha), Vacant (64.948 ha) and Water Body (4.467 ha).

Figure 4.29 Existing land use distribution of Ambegaon Budruk



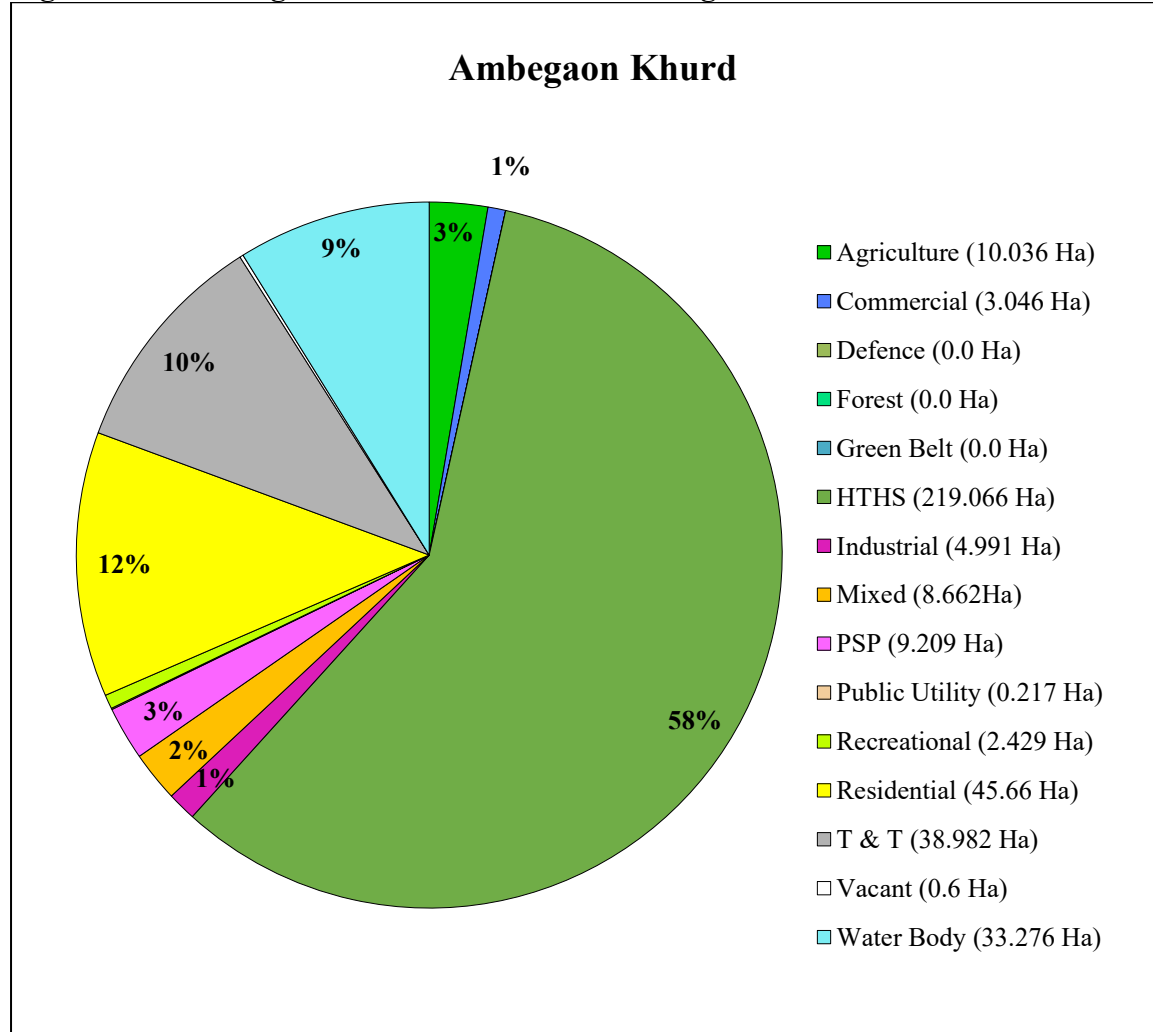
Map 4.5 Existing land use map of Ambegaon Budruk



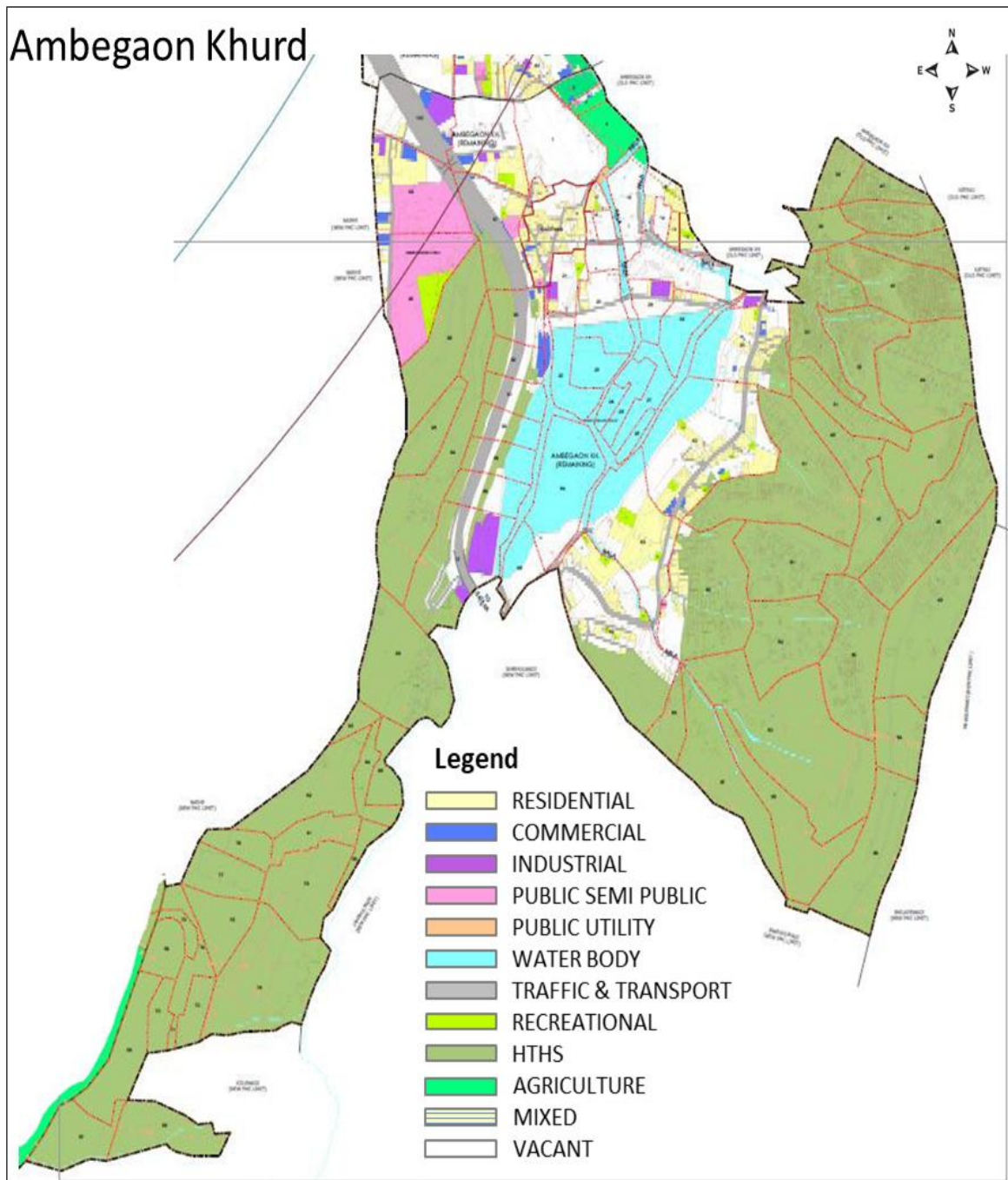
4.7.6 Ambegaon Khurd

The village is divided into land uses listed as Agriculture (10.04 ha), Commercial (3.05 ha), HTHS (219.066 ha), Industrial (4.99 ha), Mixed (8.66 ha), Public & Semi-Public (9.21ha), Public Utility (0.22 ha), Recreational (2.43 ha), Residential (45.66 ha), T & T (38.98 ha), Vacant (0.6 ha, 48.43% which is highest in the village) and Water Body (33.28 ha).

Figure 4.30 Existing land use distribution of Ambegaon Khurd



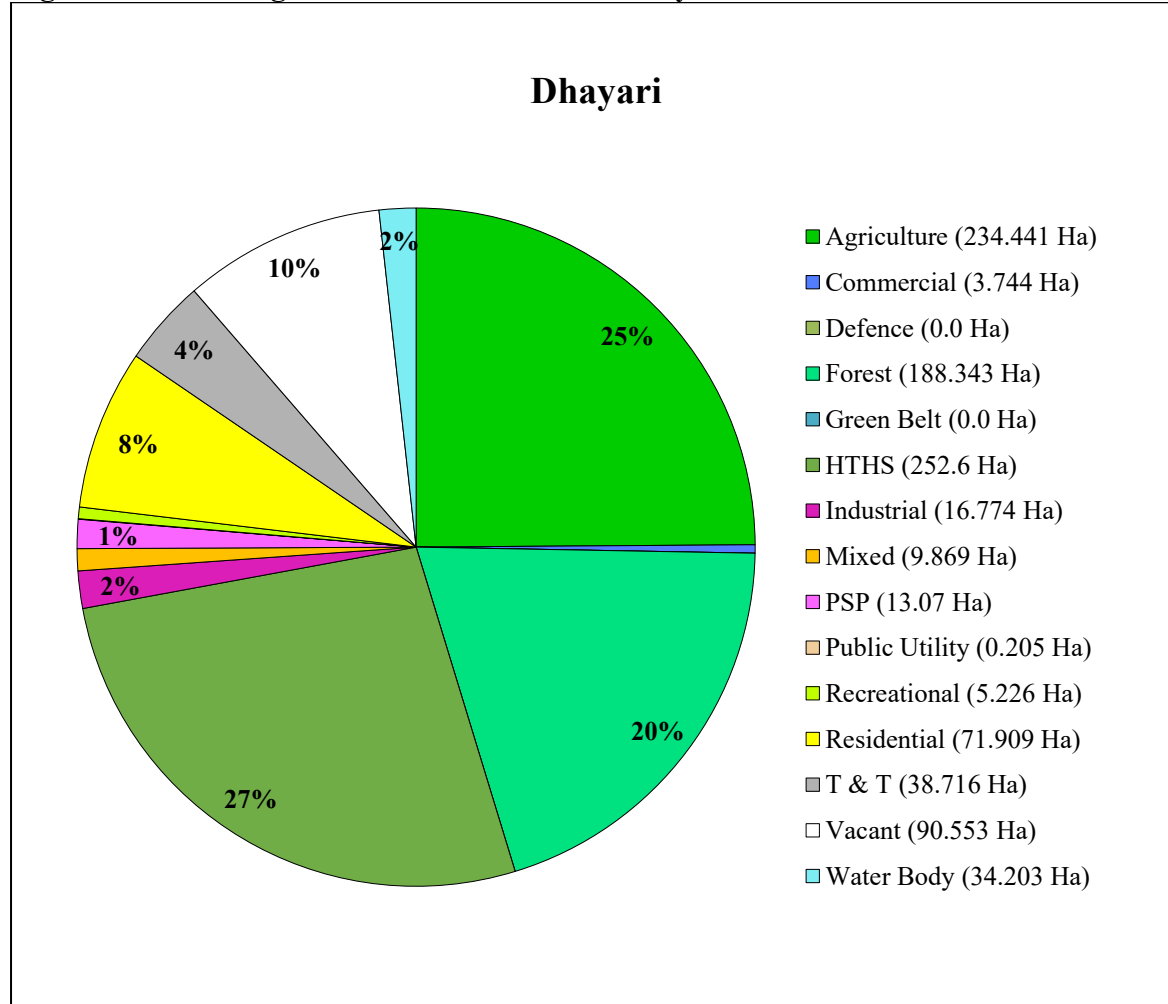
Map 4.6 Existing land use map of Ambegaon Khurd



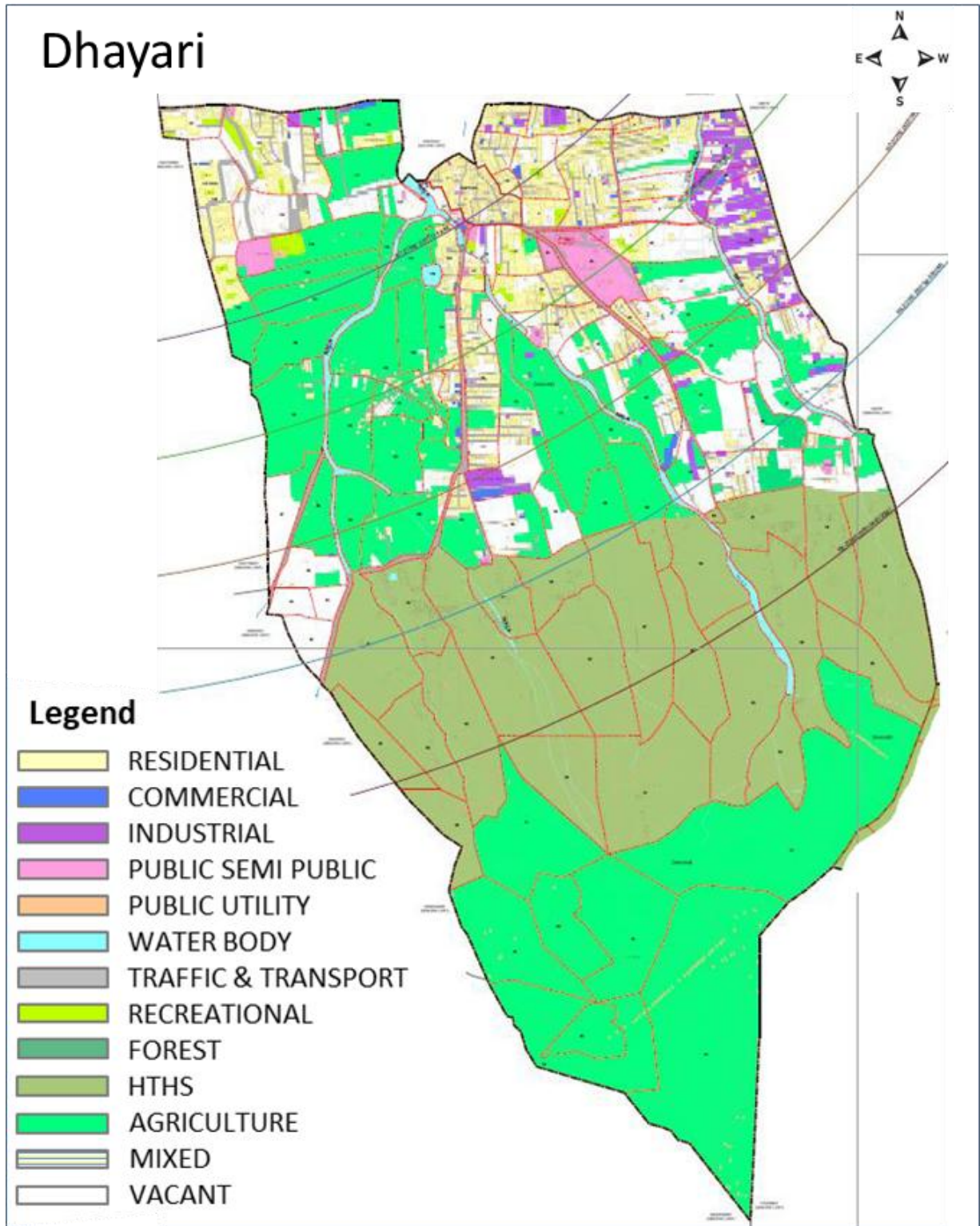
4.7.7 Dhayari

The village is divided into land uses listed as Agriculture (234.44 ha), Commercial (3.74 ha), Forest (188.34), HTHS (252.60 ha), Industrial (16.77 ha), Mixed (9.87 ha), Public & Semi-Public (13.07 ha), Public Utility (0.21ha), Recreational (5.23 ha), Residential (71.91 ha), T & T (38.72 ha), Vacant (90.553 ha) and Water Body (16.49 ha).

Figure 4.31 Existing land use distribution of Dhayari



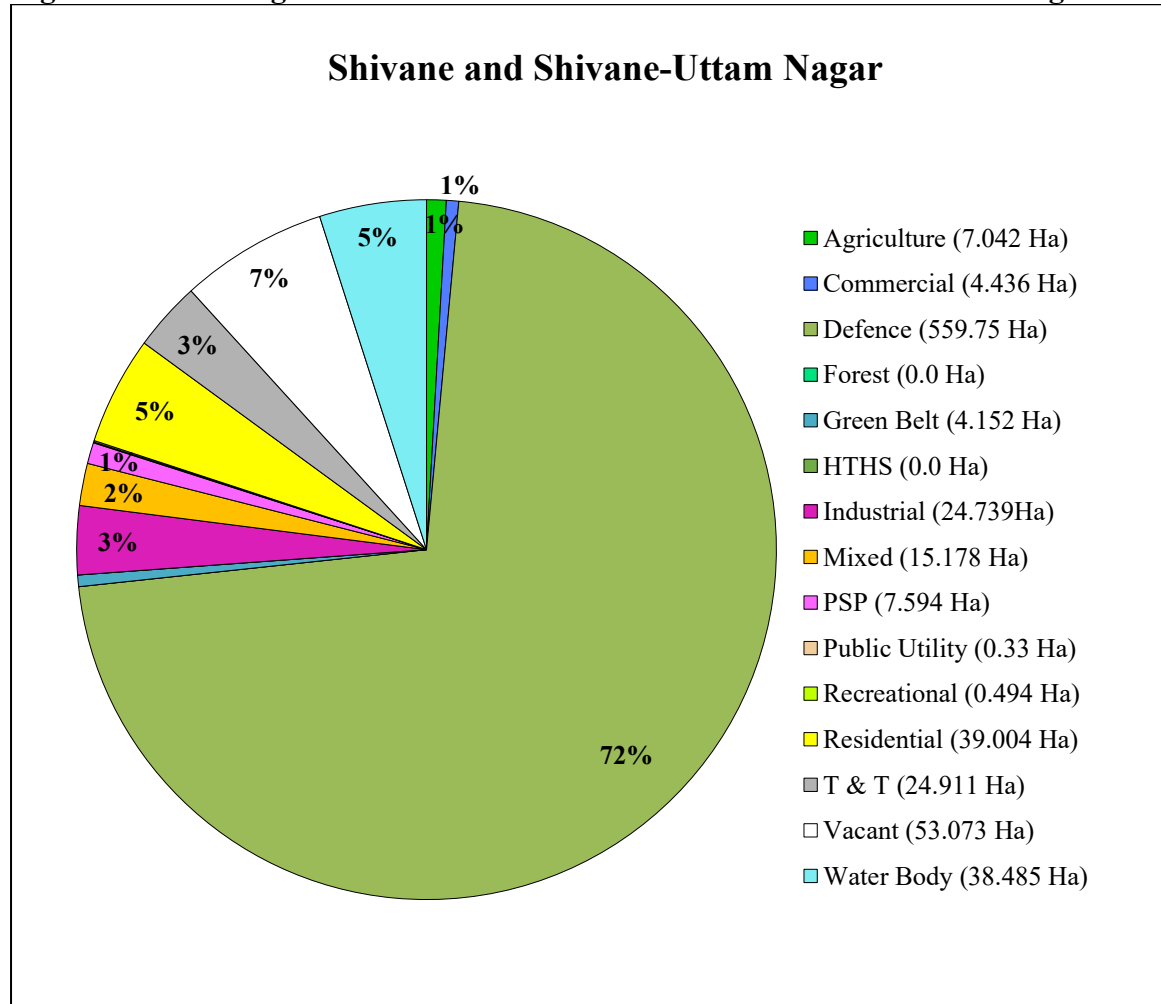
Map 4.7 Existing land use map of Dhayari

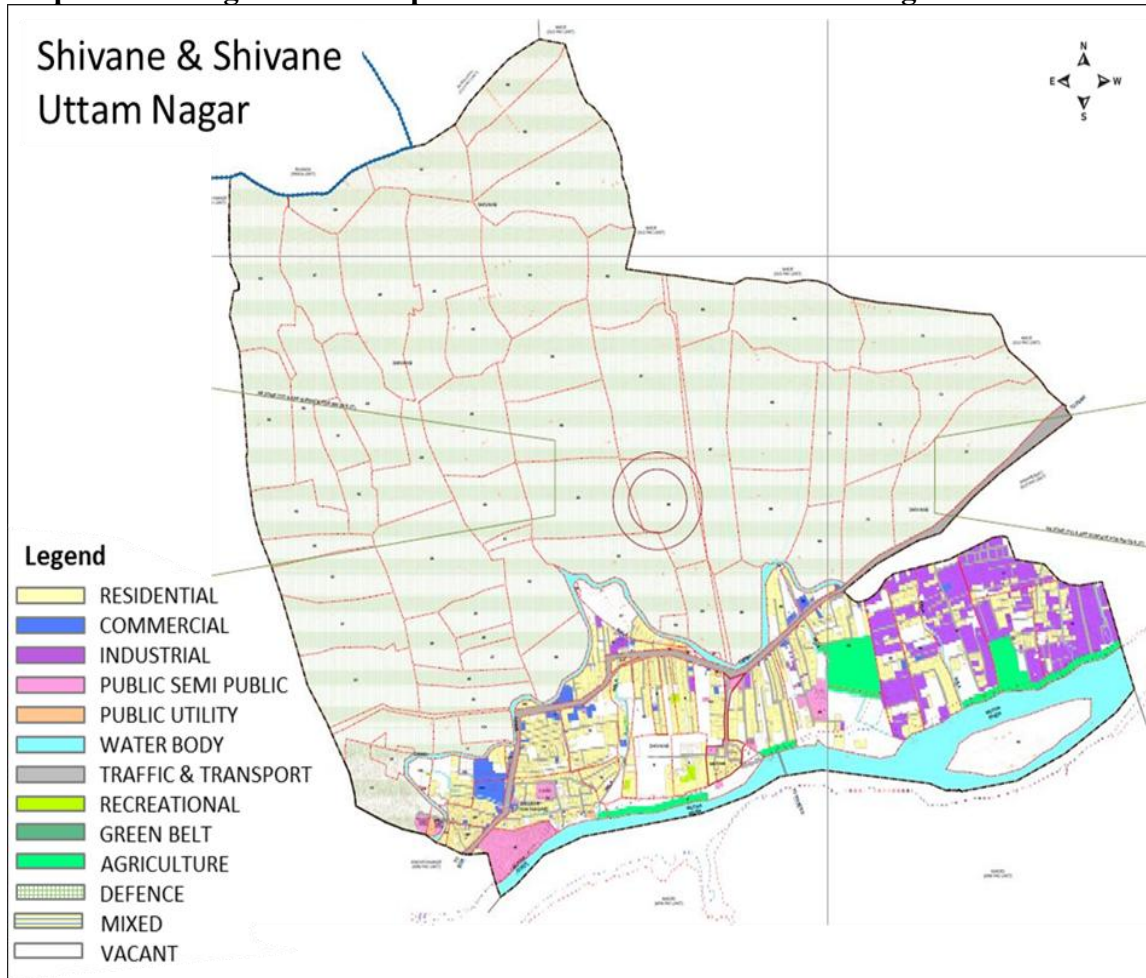


4.7.8 Shivane and Shivane (Entire Uttam Nagar)

The village is divided into land uses listed as Agriculture (7.04 ha), Commercial (4.44 ha), Defence (559.75 ha), Green Belt (4.15 ha), Industrial (24.74 ha), Mixed (15.18 ha), Public & Semi-Public (7.6 ha), Public Utility (0.33 ha), Recreational (0.49 ha), Residential (39.0 ha), T & T (24.91 ha), Vacant (53.07 ha) and Water Body (38.49 ha).

Figure 4.32 Existing land use distribution of Shivane and Shivane-Uttam Nagar



Map 4.8 Existing land use map of Shivane and Shivane-Uttam Nagar

4.8 Existing Pattern of Development in Nine Villages

Being in the Peri-urban area, many of the newly merged villages in PMC are partially developed. Primarily following patterns of development are observed in these villages.

4.8.1 Gaothan Area

Most villages have a defined Gaothan core that includes a *Gram Daivat* (local deity) temple. Traditional houses in these areas are well-ventilated and naturally lit. However, newer constructions, often built after demolishing traditional houses, tend to have minimal side margins, resulting in reduced residential environmental quality.

4.8.2 Peripheral Development

With the progression of urbanization, new development has primarily occurred along the periphery of the Gaothan area, relying on its facilities and infrastructure. These peripheral developments generally consist of low-rise structures but often lack proper accessibility and organized planning.

4.8.3 Ribbon Development

Linear or ribbon development is commonly observed along major roads connecting the city and surrounding villages. Such development typically forms a narrow band with direct access to the main road. The frontage is largely occupied by commercial establishments, eateries, fuel stations, and informal service providers, while residential units are usually located behind this commercial strip.

4.8.4 Planned Development

Urbanization has also led to the conversion of vacant or agricultural land between the city core and peripheral villages for residential and commercial uses. In some cases, residential layouts were formally sanctioned by competent authorities, often involving zoning changes. Despite these efforts, the extent of planned development in the newly merged villages remains considerably low.

Figure 4.33 Planned development - Mundhwa



Amanora Park Town: Amanora Township, a large-scale planned development in Sadesataranali, Hadapsar, occupies nearly 40% of the village area and is sanctioned under the Government of Maharashtra's Special Township Policy. Spanning 400 acres, it houses an estimated population of about 50,000 at a residential density of 36 persons per hectare. Designed on the "walk-to-destination" concept, the township integrates essential amenities within walkable distances. Its land use composition reflects a balanced approach with 63.75% under residential use, 17.50% as open spaces, 7.50% allocated to educational facilities, 1.25% to medical services, 7.50% for the Amanora Town Centre comprising recreational and commercial activities, and 2.50% for utilities, including a 2.5 MLD water supply unit and a 1.75 MLD sewage treatment plant.

4.8.5 Dense Development

Land values in urban centres are often unaffordable for the common population. Consequently, many households have resorted to informal, low-cost housing on small land parcels (*guntha* plots) without proper approvals from competent authorities. These structures typically lack adequate access, open spaces, hygienic conditions, and safety provisions. Insufficient side margins, violations of permissible Floor Space Index (FSI), and substandard construction practices contribute to dense development. Such patterns are commonly observed in pockets across most villages within the planning area.

Figure 4.34 Dense development - Ambegaon Budruk



4.8.6 Sporadic Development

In the Peri-urban area, development of individual industries/ commercial establishments at isolated spots promotes sporadic development. Also the development of new structures in the vicinity of existing farm houses located in agricultural land, takes the form of sporadic development. It is a challenge to provide infrastructure and civic amenities to such development due to lack of connectivity with the main urban settlements.

Figure 4.35 Residential development -Shaninagar, Ambegaon Budruk



4.9 Education, Economic and Employment Profile in the Planning Area

4.9.1 Education

As of now, along with many important education facilities in the fields of Aeronautics, Business Management, Engineering etc., 20 colleges and 80 primary and secondary schools are located in these nine villages. Average 50% of the population has studied at least up to SSC. This percentage is highest in Hadapsar (60.53%), while lowest in Dhayari among these nine villages. Ambegaon Khurd has the highest post- graduate individuals.

4.9.2 Occupation

As per the survey, among all the villages, 29.11% are working population. They are engaged in government service, small scale industry, private service, business, daily wages etc. Occupational distribution looks very urban, with hardly any agriculture (average 1.05% in agriculture and related activities). Undri and Dhayari still have a little more agricultural activity. Dhayari is home to the highest percentage of government employees and small business people. Highest percentage of small industry owners stay at Ambegaon Khurd, however around 2.2 % are unemployed.

4.9.3 Economic profile

Pune is the third largest contributor to the economy of Maharashtra, after Mumbai and Thane. Pune has the fifth largest metropolitan economy and the sixth highest per capita income in the country. Pune has major segments of industries in large scale sector and small-scale sector. While studying economic profile of the planning area it is important to consider industrial, educational and commercial activities of these villages.

4.9.3.1 Industrial activities: There are a number of Industrial establishments located in the planning area, most remarkable being Kalyani Center for Technological Innovation Company in Mundhwa, Poonawala Bio-Technology Park in Hadapsar. Industrial Estates in Shivane and Dhayari mostly contain small-scale industries. Mundhwa, Hadapsar, and Shivane have maximum Industrial area, while Lohgaon has less industrial area among all nine villages.

4.9.3.2 Commercial activities: Major commercial activities are along main roads in the nine villages. Lohgaon have maximum commercial area while Ambegaon Kh., Shivane and Dhayari villages have lowest commercial area. In most of the villages commercial and residential use in the form of mixed use is evident in a large number of buildings along roads.

4.9.4 Tourism centre

Nine villages have few remarkable religious and historical places also. Swami Narayan temple situated in Ambegaon Kh. is one of the major tourist attractions. Dhareshwar and Khandoba temple are ancient religious places situated at Dhayari as well as Saint Tukaram Maharaj Mandir at Lohgaon. Jambhulwadi Lake in Ambegaon Khurd has water throughout the year and is a abode for different kinds of birds. People enjoy boat rides and water sports. Historical Haran tale is situated centrally in Lohgaon. Tourist attractions located in and around nine villages- Hadapsar Gliding Centre, Tukai tekadi, Chatrapati Shivaji Maharaj Museum, Shivrushti Museum, Kanifnath Mandir.

4.10 Conclusion

It is observed that all nine villages, even though depicting peculiar characters, have some common grounds on the basis of which, planning proposals can be formulated. Most of the villages are in process of urbanization due to proximity to urban areas but lack proper infrastructure and civic amenities. Elaborated existing land use patterns of each individual village show the priorities of planning that need to be considered.

CHAPTER 5 : EXISTING SOCIAL INFRASTRUCTURE, UTILITY SERVICES AND HERITAGE

Introduction

The availability of social infrastructure such as education, healthcare, and recreational facilities is a key indicator of the quality of life of residents. While cities act as engines of economic growth, they also face increasing pressure to meet the rising demands and aspirations of their citizens. A Development Plan (DP) not only guides orderly growth through proposed land uses and development controls but also seeks to create an environment that supports desirable living standards. Social amenities, along with basic infrastructure and utility services, play a crucial role in achieving this objective.

This chapter provides an overview of the existing social infrastructure within the planning area and highlights the key components that influence the overall quality of life.

5.1 Educational Facilities

For the details about educational institutes within the planning area, a survey was undertaken and data about each institute-such as area of premises and structures, number of students, number of staff, playground, drinking water, toilet facilities, etc.-was collected, which is attached as attributes to the relevant schools in GIS-based maps).

Table 5.1 Total number of educational facilities

Village	Category		
	Primary School	High School	College
Ambegaon Budruk	8	9	10
Ambegaon Khurd	4	-	-
Dhayari	8	7	2
Hadapsar	8	5	1
Lohgaon	16	8	3
Mundhwa	10	6	-
Shivane & Shivane Uttam Nagar	9	7	1
Undri	8	8	1

It can be observed that primary education facilities, both government and private, are available in all nine villages within the planning area. Higher education facilities are concentrated in Lohgaon, Dhayari, Ambegaon Budruk, and Undri. In addition, several prestigious educational institutions are located in the adjoining areas such as Old Hadapsar, Manjari, Narhe, Wadgaon, and Warje.

Figure 5.1 School in Mundhwa

5.2 Healthcare Facilities

Data regarding existing healthcare facilities in the planning area was collected through a primary survey. Information such as premises area, building structures, number of beds (if any), number of doctors and staff, treatment facilities, drinking water, and ambulance services was recorded. This data has been attached as attributes to the respective healthcare facilities in GIS-based maps.

Table 5.2 Numbers of existing healthcare facilities

Village	Primary Health Centre	Private Clinics	Hospitals
Ambegaon Bk	1	17	9
Ambegaon Kh	-	9	-
Dhayari	1	40	3
Hadapsar	-	18	4
Lohgaon	1	51	8
Mundhwa	-	24	10
Shivane & Shivane (Entire Uttam Nagar)	2	48	7
Undri	-	35	2

Except for Ambegaon Kh, all villages have a considerable number of clinics and hospitals serving both the planning area and adjoining settlements. Owing to its close proximity, residents of Ambegaon Kh rely on the healthcare facilities available in Ambegaon Bk. Although standalone maternity homes are limited, several hospitals provide maternity services within their premises.

5.3 Recreational Facilities

Recreational open spaces serve as the lungs of the city, contributing to environmental balance and community well-being. Facilities such as playgrounds, children's play areas, gardens, parks, green belts, open spaces within layouts, sports complexes, and stadiums are categorized under recreational amenities. The total area under recreational facilities is 76.438 Ha. which accounts for 1.36 % of planning area.

5.4 Public Semi-Public Use

In addition to educational and healthcare facilities, the Public Semi-Public category also comprises Government, Semi-Government, and Public Undertaking offices, city libraries, post offices, police stations, municipal offices, amenity spaces, and amenity buildings reserved for public purposes in sanctioned layouts. The total area under Public Semi-Public land use is 163.138 Ha, which accounts for 2.91% of the planning area.

5.5 Utility Services

Utility services form the backbone of urban functioning and include water supply, drainage, electricity distribution networks, fuel pipelines, cremation and burial grounds (including animal burial grounds), garbage processing plants, fire brigade services, and gas storage facilities. The total area under utility services is 73.93 Ha, which accounts for 1.32% of the planning area.

5.5.1 Water Supply

The planning area, comprising nine newly merged villages, is located adjacent to the Pune Municipal Corporation (PMC) limits. Prior to their merger, PMC supplied bulk water to Gram Panchayats, which then managed the distribution of water to individual households within their jurisdiction. Following the merger, PMC has undertaken infrastructure development to improve and expand water supply systems in these villages. At present, the sources of water include municipal tap water, wells, tube wells, natural streams, rivers, and canals

Table 5.3 Sources of drinking water

Village	Main Source of Drinking Water							
	Tap water from treated source (in%)	Tap water from untreated source (in%)	Covered Well (in%)	Uncovered Well (in%)	Hand pump	Tube Well/Bore well(in%)	River/Canal/Tank/Pond/Lake/Spring(in %)	Other Sources
Lohgaon (Remaining)	80.7	12.1	0.5	2	0.2	1.6	1.5	1.3
Mundhwa (Remaining Keshav Nagar)	93.6	0.1	0.6	2.7	0.9	1	0.2	0.8

Hadapsar (Entire Sadesatranali)	65.8	17	0.3	0.2	0.5	10.1	0.3	6
Undri	69.8	3.5	0.5	2.3	0.6	19	4.0	0.4
Ambegaon Kh.	26.6	2.9	0.1	0	0	55.2	3.1	12
Ambegaon Bk.	84	1.6	0.3	1.6	0.3	11.4	0.2	0.6
Dhayari	86	1.7	0.1	2.2	0.8	8.3	0.6	0.3
Shivane & Shivane (Entire Uttam Nagar)	41.55	33.45	0.2	0	4.4	19.95	0.15	0.3

The Water Treatment Plants at Fursungi (capacity 33 MLD) and Kondhawe-Dhawde (capacity 6.5 MLD) cater to the existing water demand in the surrounding areas. Details of the existing Elevated Storage Reservoirs and Ground Storage Reservoirs, constructed by Maharashtra Jeevan Pradhikaran / Zilha Parishad in the nine villages, are listed in the following table:

Table 5.4 Village-wise GSR /ESR with their Capacity at Present

Village	S r N o	Address of GSR/ESR	Capacity in (Lakh) Litres	Sr No	Address of GSR/ESR	Capacity in (Lakh) Litres	Total Capacity in Lakh Litres
Ambegaon Bk	1	Gaothan	2.00	3	Behind Anna Hazare Hostel	5.00	5.50
	2	Gaothan	0.50				
Ambegaon Kh	1	Sr no 97	1.00	3	Sr No 68 opposite to Achal farm	1.00	3.00
	2	Sr No 50, Waghjai nagar	1.00				
Dhayari	1	Sr no 77/2/1/4 Raykar Mala	5.00	3	Next to Dhayareshwar Temple	1.40	11.40

	2	Behind Dhayareshe ar Temple	5.00				
Hadapsar (Entire Sade Satara Nali)	1	Sr no 274 Near Grampanchayat Office	6.00	2	Sr no 274 Near Grampanchayat Office	3.00	9.00
Lohgaon (Remaining)	1	Sump well at Gaothan	3.00	6	Sant nagar	1.80	24.30
	2	Gaothan taki no 1	7.80	7	Khandave Nagar	1.00	
	3	Sathe Wasti	5.00	8	Kahdave Nagar, Sumpwell	1.00	
	4	Khandoba maal	0.40	9	Malwadi Wasti	1.30	
	5	Ambedkar Nagar	2.00	10	Harantale Wasti	1.00	
Mundhwa (Remaining Keshav Nagar)	1	Sr no 5 Keshavnagar, Shivaji Chawk	1.75	3	Gayran wasti	0.30	15.55
	2	Sr no 6 kumbharwada	12.00	4	Gayran wasti	1.50	
Shivane & Shivane (Entire Uttam Nagar)	1	Near Kondhawe Dhawade Water Treatment Plant	12.30	2	Near New Kopare Primary School	20.00	32.30
Undri	1	Sr no 59/3, Undri - Pisoli Road	2.00	2	ZP School junction	1.50	3.50

Additionally, the Bhama Askhed Water Supply Scheme, designed for the eastern part of Pune City, is planned to supply 200 MLD of water. It will cover an area of 58 sq. km (eastern part of Pune City), including parts of nine villages, for a projected population of 10 lakh by the year 2043.

5.5.2 Sewerage and Solid Waste Disposal

i) Sewerage System:

A total of 744 MLD of sewage is generated in the old PMC limit and treated in nine STPs, with the treated effluent discharged into the Mula-Mutha rivers. Pune City has a sewerage network covering 92% of the area, spanning 2,200 km. Most of the planning area is served by a closed drainage system. Some households in isolated parts of the planning area have latrine facilities within the premises, connected to a piped sewer system or septic tank. As per Census 2011, a village-wise summary of the drainage system in the planning area is presented in Table 5.5.

Table 5.5 Village-wise summary of Drainage System (as per Census 2011)

Villages	Waste Water outlet connected to		
	Closed drainage (%)	Open drainage (%)	No drainage (%)
Ambegaon Budruk	86.1	4	9.9
Ambegaon Khurd	62.2	25.4	12.3
Dhayari	85.7	2.3	12
Hadapsar	85.6	11.3	3.2
Lohgaon	63.2	13.6	23.2
Mundhwa	85.4	3.5	11.1
Shivane & Shivane (Entire Uttamnagar)	92.65	2.9	4.35
Undri	75	7.8	17.2

A total of 477 million liters of wastewater are treated daily at 10 sewage treatment plants with a total capacity of 567 MLD, as described in the following table 5.6. Existing Sewage treatment capacity is being augmented by constructing 11 new STPs of 396 MLD treatment capacity to cater to the sewage generation in future.

Table 5.6 Sewage treatment plants (STPs) in Pune city

Sr.No.	Sewage Treatment Plant	Capacity (MLD)
1.	Bhairoba Sewage Treatment Plant	130
2.	Erandwane Sewage Treatment Plant	50
3.	Tanaji Wadi Sewage Treatment Plant	17
4.	Bopodi Sewage Treatment Plant	18
5.	Mundhwa Sewage Treatment Plant	45
6.	Vitthalwadi Sewage Treatment Plant	32
7.	Naidu (New) Sewage Treatment Plant	115
8.	Baner Sewage Treatment Plant	30

9.	Kharadi Sewage Treatment Plant	40
10.	Naidu (Old) Sewage Treatment Plant	90
	Total	567

Source: ESR 2022-2023

Figure 5.2 Mundhwa Jack well (STP)

ii) Solid Waste Management:



Solid waste is collected by the 'Ghanta Gadi' in congested parts of villages and through the 'Swachh Sanstha' in recently developed residential areas. Details of the existing setup for segregation and collection are provided in the following table.

Table 5.7 Segregation and Collection Status at present in the Planning Area

Sr No	Village	Vehicles used for collection	Labours engaged in waste collection and segregation
1	Ambegaon Bk	11	64
2	Ambegaon Kh	4	52
3	Dhayari	4	53
4	Hadapsar (Entire Sadesatara Nali)	7	60
5	Lohgaon	10	130
6	Mundhwa	5	49
7	Shivane	10	45
8	Shivane-Uttam Nagar	3	17
9	Undri	7	20
	Total	61	490

A solid waste processing site with a capacity of 180 MTPD for dry waste is located in the villages of Uruli Devachi and Fursungi. A major part of the solid waste collected from the city is processed and disposed of at this site, with details provided in the earlier chapters.

Figure 5.3 Garbage Processing Plant at Uruli-Fursungi



Table 5.8 Dry Waste Processing Plants within or in vicinity of the Planning Area

Project Name	Project location	Operational capacity (MTPD)
RDF-3	Keshav Nagar	50
RDF-5	Keshav Nagar	85
RDF-6	Ambegaon	Vandalized during local protest in Nov 2020
MRF-1	Katraj	50
MRF-3	Dhayari	50

5.5.3 Crematorium and Burial Grounds

The existing crematoriums and burial grounds located at different locations in nine villages are listed below in Table 5.9.

Table 5.9 Village wise details of Burial grounds and Crematorium

Village	Crematorium		Burial Ground	
	Area (Ha)	Location	Area (Ha)	Location
Ambegaon	0.0470	Along Nala	-	-
Budruk	0.1125	Survey no 38		
Ambegaon Khurd	0.0983	Nala	-	-
Dhayari	0.0818	Gaothan, Nala	-	-
Lohgaon	0.1258	Gaothan	-	-
	0.1795	Gaothan		
	0.1338	Harantale Wasti		
	0.9701	Harantale Wasti		

Mundhwa	0.0096	Survey no 100	0.02Ha	Sr.No.100 part
Shivane & Shivane-Uttam Nagar	0.0749	On Mutha river bank	-	-
Undri	0.0980	Survey no 15	-	-
	0.1351	Gaothan	-	-

Presently there is no burial ground facility for animals in nine villages.

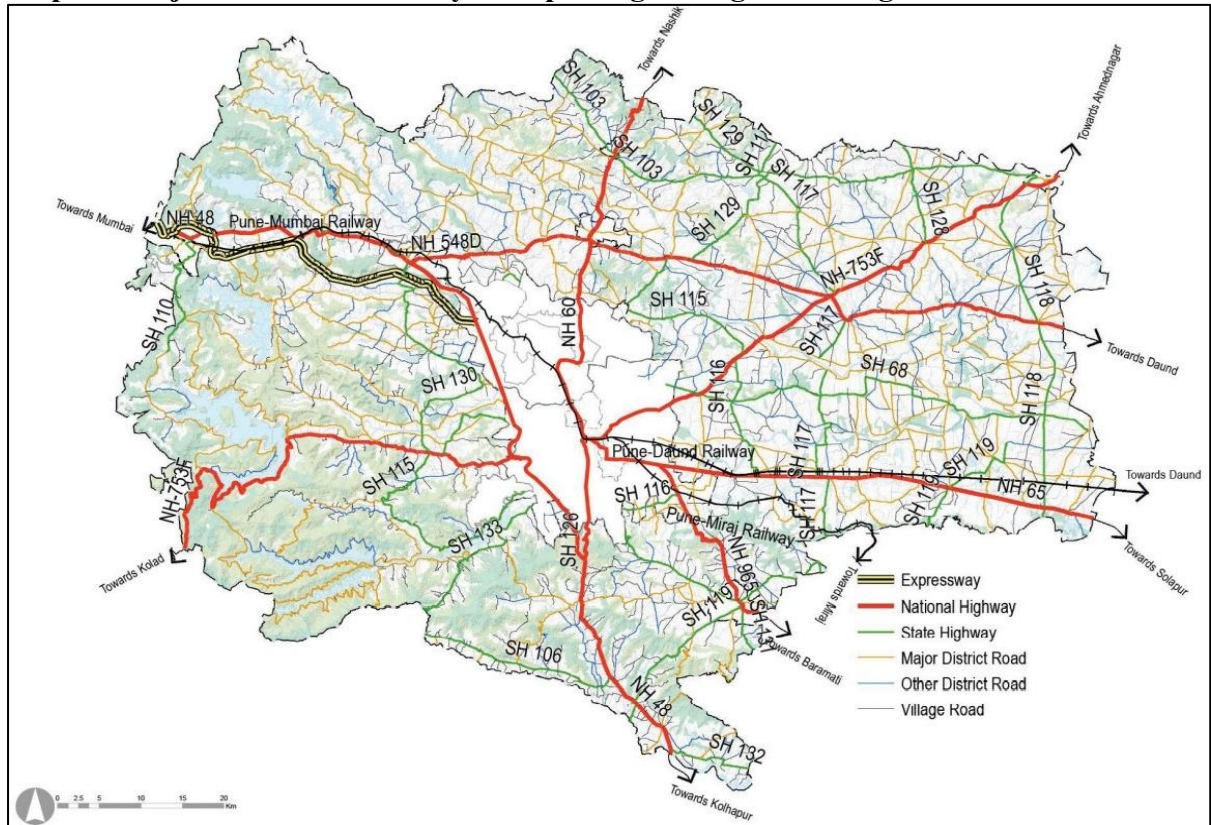
5.5.4 Power Supply

MSEDCL supplies electricity to the planning area through grid and transformer stations. High-tension lines pass through Ambegaon Bk, Fursungi, Uruli, and Hadapsar–Sadesatranali within the planning area. Major electricity sub-stations are located at Fursungi (15.18 ha) and Hadapsar–Sadesatranali (3.95 ha).

5.5.5 Traffic and Transportation

Pune City is well connected with all major cities through its road network. All major highways and railways in Pune City pass through the planning area. The Pune Regional Plan, 1997, has proposed alternative routes to highways passing through major towns such as Chakan, Wagholi, Hinjawadi, Shikrapur, Khed Shivapur, Loni Kalbhor, and Uruli Kanchan. Two major railway routes under Central Railways in the Pune region are Mumbai–Pune–Solapur and Pune–Miraj. The low frequency of suburban rail services has led to a dependency on road-based transport systems.

Map 5.1 Major roads and railway lines passing through Pune region



Source: Public Works Department GoM, Pune;

Table 5.10 Length of Existing Road Alignments in the Planning Area

Sr no	Hierarchy of roads	Length in km	Percentages of total length of connectivity network
1	National highway	10.156	1.95 %
2	State Highway	9.795	1.88 %
3	Major District Road	10.816	2.08 %
4	Village roads	29.213	5.62 %
5	Internal/Local roads/lanes	444.705	85.58 %
6	Ring Road	7.556	1.45 %
7	Railway Lines	7.388	1.42 %
	Total	519.629	

5.6 Heritage & Tourism

Pune has several remarkable historical and archaeological sites declared as heritage sites, such as Shaniwar Wada, Parvati, Vishrambaug Wada, Pataleshwar Caves, Trishund Ganpati Mandir, Omkareshwar Mandir, Dagadi Nagoba Mandir, and others. Although the newly added villages do not have heritage sites, some fascinating places to visit—such as Jambhulwadi Bridge, Swami Narayan Mandir, and museums like Shivrushti and the Chhatrapati Shivaji Maharaj Museum—are located within the planning area. Pune City is also surrounded by wilderness and scenic natural spots suitable for birdwatching and trekking, some of which fall within the planning area. Overall, Pune City, along with the newly added nine villages, holds considerable potential for tourism development.

The following locations in and around the nine villages have been identified to help promote and enhance tourism

- Khadakwasla Dam
- Swami Narayan Temple, Ambegaon Kh
- Shivrushti, Ambegaon Bk
- Jambhulwadi Lake, Ambegaon Kh
- Zapurza Museum, Kudaje
- Chhatrapati Shivaji Maharaj Museum of Paintings, Lohagaon
- Wagheshwar Temple, Wagholi
- ISKCON Temple, Kondhwa
- Ayyappan Temple, Shivane Uttamnagar

5.7 Heritage and Tourist Attraction Spots in Nine Villages

5.7.1 Sant Tukaram Maharaj Temple and Haran Tale, Lohgaon

Sant Tukaram (17th-century Marathi saint-poet) is one of the most prominent torchbearers of the Vaishnav Bhakti Marg. He emphasized salvation through devotion and service to mankind rather than through rituals and sacrifices. During his 41 years of life, he composed over 5,000 *Abhangs* (devotional songs). The depth of his understanding of the world, nature, and the human mind is reflected in the varied themes of his poetry, which provide a vivid picture of the social and religious conditions of his time. Through his *kirtans* and *bhajans*, Saint Tukaram also highlighted the evils within society and the social system. His mother is said to have hailed from Lohgaon. The Sant Tukaram Maharaj Temple, dedicated to him, is located centrally in Lohgaon Gaathan and receives a regular footfall of devotees.

Figure 5.4 Saint Tukaram Maharaj Temple, Lohgaon



Harantale, spread over an area of 24.39 hectares, is a natural lake located in Lohgaon. It is a sacred site imbued with the aura of meditation of Saint Tukaram Maharaj, who is said to have meditated here. There is potential for developing it as a tourism site; however, to preserve the lake, direct access to the water should be restricted. A fence can be constructed between the lake and the surrounding walking track to prevent human interference.

Figure 5.5 Harantale, Lohgaon



5.7.2 Swami Narayan Temple

The Swami Narayan Temple, located in Ambegaon Khurd, is one of the major tourist attractions in Pune. Open to visitors since 2017, the temple is managed by the Swami Narayan Trust. A light and sound show conducted in the evenings is a key highlight that draws large crowds. Architecturally and stylistically, the temple complex resembles the Akshardham Temple in Delhi.

Figure 5.6 Swami Narayan Temple, Ambegaon Kh



5.7.3 Dhareshwar and Khandoba Temple, Dhayari

Dhayari village derives its name from Dhareshwar, one of the names of Lord Shiva. The ancient Dhareshwar Temple, rebuilt in 1978, is located on a hillock near the gaathan. Another heritage site, the ancient Khandoba Temple, is situated on the southern scenic hills overlooking the entire region of Dhayari. This 400-year-old temple, located at the highest point in the planning area at an altitude of 975 m, is surrounded by reserved forest. The development and conservation of green spaces around these temples would further enhance the scenic beauty of these sites.

Figure 5.7 Khandoba Temple, Dhayari



Figure 5.8 Dhareshwar Temple, Dhayari



5.7.4 Jambhulwadi Lake

Jambhulwadi Lake, located in the southern part of Ambegaon Khurd, is a reservoir built and maintained by the Water Resources Department. The lake retains water throughout the year and serves as a habitat for a variety of bird species, including migratory birds that visit between September and March. It supports a rich and diverse ecosystem.

With support from the Water Resources Department, the State Government has initiated restoration, conservation, and preservation measures for Jambhulwadi Lake and its ecosystem. Development of walking trails and other beautification works around the lake is currently in progress. However, due to high levels of pollution, the lake water is rarely used for drinking purposes. It is crucial to ensure that no untreated wastewater is discharged into the lake.

Jambhulwadi Lake has the potential to be preserved as a wetland ecosystem and an important habitat for aquatic birds. The construction of a fountain could improve aeration, increase dissolved oxygen levels, and enhance the ecological health of the lake, making it more suitable for aquatic life.

Figure 5.9 Jambhulwadi Lake, Ambegaon Kh



5.7.5 Shivsrushti, Ambegaon Bk

Figure 5.10 Shivsrushti, Ambegaon Bk



The project theme revolves around recreating the bygone era of the Maratha Empire, known as *Shiv Kaal*, in its full grandeur, hence the name *Shivsrushti*. The museum showcases the legacy of the Great Maratha Emperor Chhatrapati Shivaji Maharaj, with exhibits and information available in multiple languages for visitors.

5.8 Recommendations for Heritage & Tourism

Tourism in the Planning area can be promoted by providing tourist facilities as listed below, in collaboration with Maharashtra Tourism Development Corporation.

- Protecting the natural eco-sensitive sites from illegal encroachment.
- Restoration & preservation of Natural sites with proper guided map and preservation of the hills in the city with plantation for ample tree cover.
- Preservation, restoration & maintenance of water bodies through provision of Green Belts/ River protection Belts. Development of the riverfront for potential tourism.
- Development of Parks/ Urban Forests on the sites.
- Development of bird sanctuaries, bird sighting spots along the lake/ River.
- Rope-way projects at appropriate locations can be proposed in the hilly region.

People's participation should be invited for saving and improving the environment. Efforts should be made for creating environmental awareness and a sense of ownership and responsibility among the local population.

CHAPTER 6 : DEMOGRAPHIC STUDY

Introduction

Urbanisation studies indicate that cities across the country are expanding rapidly in both size and population, primarily due to migration. This growth often results in the inclusion of fringe villages within municipal boundaries. Pune is experiencing a similar trend. In contrast, Mumbai has reached a point of saturation owing to geographical constraints. Consequently, urban growth in Maharashtra is now being reflected in nearby cities such as Thane, Nashik, and Pune.

According to Census 2011, the population of the Pune Urban Agglomeration was 50,57,709. With saturation within the municipal limits, the city continued to expand outward into fringe areas in the absence of natural barriers. Table 6.1 presents the population of Pune city from 1951 to 2011, based on Census data.

Table 6.1 Population and its growth

Census	Population	Decadal Exponential Growth Rate
1951	4,88,419	-
1961	6,06,777	2.17
1971	8,56,105	3.44
1981	12,03,363	3.40
1991	16,91,430	3.40
2001	25,38,473	4.06
2011	31,24,458	2.08

It can be observed that the growth of Pune city accelerated significantly after 1961, with the highest growth rate recorded during 1991–2001. In the subsequent decade (2001–2011), however, the rate of population growth slowed considerably. The Pune Municipal Corporation (PMC) boundary has been expanded periodically, most recently in October 2017 with the inclusion of nine fringe villages, namely Lohgaon (remaining part), Mundhwa (remaining Keshav Nagar), Hadapsar (entire Sadesataranali), Undri (remaining part), Ambegaon Budruk, Ambegaon Khurd, Dhayari (remaining part), Shivane (remaining part), and Shivane (entire Uttam Nagar). The latest expansion took place on 30th June 2021, when 23 additional fringe villages adjoining these earlier nine were merged into the PMC. With the inclusion of these 23 villages, the total jurisdiction of the Pune Municipal Corporation increased to 484.26 sq. km.

As part of the preparation of the Development Plan (DP) for the nine villages merged in 2017, the Gokhale Institute of Politics and Economics (GIPE), Pune, was appointed to conduct a demographic survey and prepare population projections for the planning period 2023–2043. According to the GIPE Report, based on earlier Census data, certain inferences about the growth of these villages can be drawn.

As per the Census of India, 2011, the nine villages together had 40,247 households with a total population of 164,018 persons. During the decade 2001-2011, the combined population of these villages increased by 1.5 times, registering a growth rate of 3.96%. In contrast, the rate of growth within the PMC limits during the same decade was only 2.08%, which is significantly lower than that of the planning area comprising the nine villages. Villages such as Ambegaon Khurd, Undri, and Shivane witnessed very rapid growth, recording rates of about 10% or more.

Table 6.2 Main characteristics of population of nine villages, census 2011

Sr. No	Village	No. of households	House hold size	Population	Sex Ratio	Child sex ratio	Share of Population (0-6 yr)	Share of workers	Share of literates
1	Ambegaon Bk	5,361	4.0	21,387	866	828	16.2	38.9	85.4
2	Ambegaon Kh	2,563	4.3	10,959	878	877	17.1	34.9	80.7
3	Dhayari	5,600	3.9	21,861	897	851	14.0	38.7	86.2
4	Hadapsar	3,738	4.0	14,833	876	844	14.5	40.4	83.2
5	Lohgaon	7,526	4.4	32,857	856	912	12.3	36.7	87.3
6	Mundhwa	7,537	4.0	29,965	837	861	13.8	41.2	85.1
7	Shivane	4,099	4.1	16,689	886	866	13.5	38.4	87.0
8	Shivane-Uttam Nagar	1,775	4.2	7,497	946	962	11.8	35.9	83.7
9	Undri	2,048	3.9	7,970	834	805	14.5	41.8	81.2
	Total	40,247	4.1	1,64,018	874	867	14.2	38.5	84.4
	Pune City	7,42,602	4.2	31,24,458	948	908	10.8	38.5	86.7

6.1 Sample Survey of Nine Villages

Gokhale Institute has conducted a sample survey covering 3,484 households, which accounts for approximately 10% of the households as per Census 2011, in these nine villages. The survey covered a population of 12,013 persons. The samples were selected using the PPS technique (Population Proportional to Size).

In each village, the sample was divided into six strata, ranging from the lowest to the highest household/population density. The number of households selected followed a ratio, such that if the lowest density stratum had X households, then the subsequent strata had 2X, 3X, 4X, 5X, and 6X households respectively.

After the physical demarcation of stratum boundaries, interviewers began the survey from the north-east end of the area, selecting every fifth house as a sample. In the case of apartment buildings, only one household per building was considered as a sample.

Table 6.3 Sample collection as per stratum

Villages	Density						Total	Actual sample collected
	1	2	3	4	5	6		
Ambegaon Budruk	22	44	66	88	110	132	462	468
Ambegaon Khurd	11	21	32	42	53	63	222	224
Dhayari	23	46	69	92	115	138	483	484
Hadapsar	15	31	46	61	77	92	322	327
Lohgaon	31	62	93	124	155	186	651	622
Mundhwa	31	62	93	124	155	186	651	658
Shivane	17	34	51	67	84	101	354	360
Shivane (Uttam Nagar)	7	15	22	29	36	44	153	163
Undri	8	17	25	34	42	51	177	178
Total	165	332	497	661	827	993	3475	3484

6.2 Information collected through sample survey

The household sample survey was conducted to understand the socio-economic status, living conditions, transportation patterns, recreational activities, and access to amenities of the population residing in the nine villages. Detailed information was collected regarding household size, crowding, social subgroups, and demographic characteristics such as age distribution, working-age population, sex ratio, marital status, education, occupation, and migration. The details of these parameters are presented in the tables below.

Table 6.4 Characteristics of population of nine villages, as per sample survey 2018

Village	No. of households	House hold size	Population	Sex Ratio	Child sex ratio	Share of 0-6 Population	Share of literate
Ambegaon Budruk	468	3.0	67752	744	727	7.3	90.2
Ambegaon Khurd	224	3.0	35544	828	859	7.47	93.1
Dhayari	484	2.3	36758	700	719	6.23	85.9
Hadapsar	327	3.8	46981	1010	1018	10.21	89.4
Lohgaon	622	4.6	122627	990	992	10.98	86.5
Mundhwa	658	3.9	68376	945	951	9.36	88.5
Shivane	360	2.8	55410	812	798	6.74	92.4
Shivane UT	163	3.0		858	852	7.22	93.2
Undri	178	2.9	30280	804	820	5.81	85.1
Total	3484	3.4	4,63,728	855	860	7.92	89.4

By comparing the characteristics of these nine villages observed in the sample survey with Census 2011, it can be noted that the household size and the share of the 0-6 years age group have decreased in the sample survey. The sex ratio and child sex ratio show a slight decline. On the other hand, the share of literates has increased, reflecting improvements in education over time.

6.2.1 Social Subgroups

It is noteworthy that during the sample survey, 100% residents reported their religion but at the same time caste is reported by only 67.9%.

Table 6.5 Social sub-groupwise percent distribution of households

Village	Religion			Caste			
	Hindu	Muslim	Other	Caste reported	SC	ST	Other
Ambegaon Budruk	94.00	1.30	4.70	67.10	29.60	9.90	60.50
Ambegaon Khurd	89.70	4.90	5.40	34.40	23.40	9.10	67.50
Dhayari	90.10	6.20	3.70	36.00	66.10	33.30	0.60
Hadapsar	95.50	2.40	2.10	88.40	47.10	13.80	39.10
Lohgaon	89.20	3.10	7.70	69.60	62.30	4.80	37.20
Mundhwa	90.10	6.70	3.20	79.50	47.60	5.40	47.00
Shivane	91.10	4.20	4.70	65.00	11.10	8.50	80.40
Shivane (Uttam Nagar)	90.20	6.70	3.10	80.40	16.00	17.60	66.40
Undri	87.70	6.70	5.60	28.90	19.30	16.40	64.30
Total	90.80	4.40	4.80	66.60	35.15	11.30	46.45

6.2.2 Size of Household

The number of persons residing in the house in the selected households ranges from 1 to 15. The average size of the household is least in Dhayari (2.3) highest in Lohgaon (4.6). Thus, the average size of household in nine villages is 3.4 as compared to 4.2 for old PMC limit as per Census 2011.

6.2.3 Demographic Characteristics of the Population

This is demographic characteristics exploration of the people living in these villages-

6.2.3.1 Age distribution:

Age is a critical demographic indicator giving the understanding of the population and their needs based on the services required. In the nine villages, the share of children under 15 years and elderly (60+) is 22.1% and 6.9% respectively while the remaining 71% are in working ages.

Table 6.6 Percent distribution of villages by age distribution of the population

Villages	Percentage of Population			Total
	0-14	15-59	60 years and above	
Ambegaon Budruk	15.8	77.7	6.4	1383
Ambegaon Khurd	16.7	79.4	3.9	669
Dhayari	10.3	88.7	1.0	1107
Hadapsar	26.7	66.5	6.8	1234
Lohgaon	24.4	67.2	8.4	3022
Mundhwa	24.1	68.2	7.7	2573
Shivane	14.2	82.4	3.4	1024
Shivane (UT)	17.3	75.7	7.0	485
Undri	14.1	79.1	6.8	516
Total	20.26	73.36	6.37	12013
Pune District (Urban 2011)	24.1	68.1	7.8	5725048

The villages like Mundhwa, Lohgaon, Hadapsar with some rural nature, display higher fertility patterns. Most of the villages have a proportion of elderly population visibly less and that of working age population high. The Median value of average age is around 30 years. All nine villages together have 33.3% population in a highly productive age group of 25-40 years. Villages like Shivane, Dhayari, Undri, Ambegaon Budruk and Ambegaon Khurd reflect prominence of workers with a working age population very high.

Dependency ratio of the population is the number of dependent on the working- age population. Dependents include both children (below 15 years) and the elderly population. According to the Census 2011, the dependency ratio of the urban population of the district is 46.8. Dependency ratio of the study population shows large variations between 12.7 in Dhayari to 50.1 in Hadapsar. It is interesting to understand young and old dependencies separately. Young dependency is the ratio of the number of children below 15 years to the working population, whereas old dependency is the ratio of the number of elderly people with the working population. Young dependency ratio in nine villages ranges between 11.6 to 39.9 while old dependency ratio in nine villages varies between 1.1 to 12.5.

6.2.3.2 Sex distribution

Ideally, the proportion of men and women in any population should be equal. A lower sex ratio reflects gender inequality and may indicate practices such as female foeticide or large-scale migration, both of which are evident in the nine villages under study. The combined sex ratio of these villages is 890, which is broadly consistent with the figure of 904 reported for Pune District (Urban) in Census 2011. Among the villages, the sex ratio is lowest in Dhayari (700) and Ambegaon Budruk (744), while Hadapsar records the highest sex ratio of 1000.

With regard to the child sex ratio, villages such as Hadapsar, Lohgaon, and Mundhwa show figures close to the normal level of 950. However, significant distortions are observed in

Dhayari (719), Ambegaon Khurd (859), Ambegaon Budruk (727), Shivane (798), Shivane-Uttam Nagar (852), and Undri (820). The large-scale working age population and distorted age sex ratio in various age groups in nine villages does not match with Pune city or Pune Urban in general.

Table 6.7 Sex ratio and age-specific sex ratio of study population by village

Village	Sex Ratio	Child Sex Ratio	Sex Ratio w.r.t. Age		
			0-15	15-59	60+
Ambegaon Budruk	744	727	724	772	492
Ambegaon Khurd	828	859	647	883	625
Dhayari	700	719	500	732	375
Hadapsar	1010	1018	848	1094	909
Lohgaon	990	992	1067	965	977
Mundhwa	945	951	766	1011	990
Shivane	812	798	768	831	591
Shivane (Uttam Nagar)	858	852	680	902	889
Undri	804	820	460	855	1188
Total	890	910	819	932	852
Pune district-Urban 2011	904	NA*	887	898	1019
Pune City- 2011	948	908	NA	NA	NA

NA*- Data not available

6.2.3.3 Education and Occupation

A significant share of individuals with higher education (graduates or above) are found in the villages of Dhayari, Ambegaon Khurd, and Shivane. Across all villages, 56.7% of the population has studied at least up to the SSC level, with higher proportions observed in Shivane, Ambegaon Khurd, and Ambegaon Budruk. In contrast, the percentage is comparatively lower in Hadapsar and Lohgaon.

Occupational pattern gives fair idea about occupation in which the population is engaged. Different types of occupations mainly observed in nine villages were daily wages, small scale industries, cottage industries, private industries, govt service. Students, housewives, retired persons. In nine villages, along with 26.4% housewives, 31% students, 3.7% retired persons, 2.2% unemployed, and remaining 36.7% are working persons. Most of the working population was observed to be engaged in urban occupations. Village like Dhayari have agriculture and related occupations, while other villages have a tiny share of this occupation. Hadapsar, Mundhwa have maximum students while Dhayari has maximum share of home makers.

6.2.3.4 Migration

Migration forms an integral component of both development and urbanization. The fringe villages of Pune offer basic amenities, relatively easy access to the city, and comparatively

lower living costs-particularly in terms of housing. These factors collectively attract migrants from other regions into the city's periphery. Understanding migration requires examining its underlying causes, duration, the entry of the first migrant within families, and the demographic characteristics of migrants.

It is observed that 75.7% of the migrants in the nine villages are first-generation migrants, while 13.9% belong to the second generation. Among the villages, Lohgaon records the highest proportion of migrants (72.2%), whereas Ambegaon Budruk has the lowest (27.8%). On average, migrants constitute 48.4% of the total population across the nine villages.

The reasons for migration and place of origin & place of migrants in nine villages are demonstrated in the following table.

Table 6.8 Percent distribution of migrated households by reason & place of origin

Village	Reason for migration				Place of origin			
	New job	Education	Family migrated	Total	Migrants within state	Migrants outside state	Total migrant household	% migrant household
Ambegaon Budruk	91.5	6.9	3.1	130	85.4	14.6	130	5.0
Ambegaon Khurd	72.6	22.6	5.7	106	89.6	10.4	106	4.1
Dhayari	82.4	14.4	5.3	188	93.5	6.5	136	5.2
Hadapsar	86.2	9.0	6.9	145	86.9	13.1	145	5.6
Lohgaon	96.8	1.9	1.1	471	80.3	19.7	471	18.2
Mundhwa	94.3	2.7	4.8	334	76.6	23.4	334	12.9
Shivane	83.8	13.2	4.4	136	88.2	11.8	186	7.2
Shivane (Uttam Nagar)	86.0	6.0	26.0	50	86.0	14.0	50	1.9
Undri	95.9	4.1	5.2	97	66.0	34.0	97	3.7
Total	90.4	6.1	3.5	1657	84.4	15.6	1657	100%

As expected, the primary reason for migration is employment, accounting for 92% of cases. A large share of migrants (84.4%) originates from within the state, predominantly from nearby areas, while 15.6% come from outside Maharashtra. Most migration (65.3%) is relatively recent, occurring within the last two decades.

The average family size of migrants (3.5) is smaller compared to that of resident households (3.9). The age distribution of migrants is distinctive, with a lower proportion of children and a higher proportion of individuals in the productive age group. In contrast, education levels and occupational patterns of migrants show little variation when compared with the local resident population.

The Difference between various characteristics of migrants and local villagers can be seen through the following table:

Table 6.9 Percent distribution of migrated households by reason & place of origin

Demographic characteristics	Local Villagers	Migrant population
Average family size	3.9	3.5
Age		
0-14 years	24.2	19.7
15-59 years	70.4	72.4
60 years and more	5.4	7.9
Sex		
Male	51.8	53.6
Female	48.2	46.1
Other	-	0.1
Marital status		
Never married	39.5	37.7
Married	59.3	60.4
Widowed / Divorced / Separated	1.3	1.9
Education		
Illiterate	11.9	10.3
Pre-primary	6.2	5.6
Primary	12.6	11.9
Secondary	15.6	14.3
SSC	16.7	16.9
Higher Secondary	16.3	19.6
Diploma	2.6	3.4
Graduate	14.8	15.4
Post-graduate	3.3	2.6
Occupation		
Government job	2.1	2.1
Private job	16.7	15.7
Daily wages	6.8	5.1
Small Industry	3	3.1
Cottage Industry	0.2	0.6
Housewife	26	26.9
Student	31	29.7
Retired / Pensioner	3.0	4.0
Unemployed	1.7	3.3
Farmer	1	0.8
Agri-based business	0	0.2
Poultry	0	0
Animal Husbandry	0	0.1
Different sized Business	1.5	2.1

Other	7.8	6.4
Total	100% (6213)	100% (5800)

6.3 Population Projection

The Development Plan for nine villages is being prepared for the next 20 years keeping in mind the horizon year of 2045. The civic amenities are being planned for the projected population of year 2035, while various land use zones and infrastructural projects are being planned to cater to the population of the year 2045. In this context, the projected population for nine villages need to be worked out meticulously.

Classic methods of population projections like component method or ratio method does not work for these nine villages, considering the very small size of population and unavailability of the current and projected data on age sex distribution of population, age-specific fertility rates, total fertility rates and life expectancy by sex of the population and the distortion in demographic characteristics caused by heavy migration.

The Gokhale Institute of Politics and Economics, has provided projected figures of population based on various methods considering the nature and peculiarity of characteristics of the nine villages.

Population Projections in these nine villages are based on two different methods

- Method 1- Availability of Developable Land
- Method 2 - Growth of the Villages

Method 1: Availability of Developable Land

Based on a physical survey by Urban Planners, household survey and expert opinions, the nine villages are categorized in three groups, Low potential villages, Moderate potential villages and High potential villages; based on the pattern of growth in the past 30 years as well as their potential of growth in terms of available land.

Potential	Villages
Low	Ambegaon Budruk, Shivane, Shivane (Uttam Nagar)
Moderate	Ambegaon Khurd, Lohgaon, Mundhwa, Hadapsar
High	Dhayari, Undri

90% occupancy of the tenements as actual survey is considered for arriving at the population of the respective village in the year 2018. Based on the available land and characteristics thereof developable area of each village is worked out. The population of 2018 and the developable area of each village have given the framework for population projection.

Using the earlier trend of growth, availability of land and potential for migration, the population of every village is projected for years 2023, 2033, 2043. Two scenarios are considered while projecting the population.

- i) Constant rate of growth of all villages till year 2023
- ii) Variable growth of villages as per availability of land and potential for growth of that village till year 2023

For year 2033 and 2043 assumption for potential of growth is similar in both the scenarios.

Method 1- Scenario 1: Constant Rate of Growth

Table 6.10 Projected population of nine villages for the years 2018, 2023, 2033 and 2043 assuming constant rate of growth

Name of the village	Projected population			
	2018	2023	2033	2043
Ambegaon Budruk	67752	71817	78999	86899
Ambegaon Khurd	35544	39809	47771	57325
Dhayari	36758	47786	71679	100350
Hadapsar	46981	61075	83156	99787
Lohgaon	122627	159415	239122	334770
Mundhwa	68376	80683	104888	136355
Shivane & Shivane Uttam Nagar	55410	58735	64608	71069
Undri	30280	37547	52566	70965
Total	457728	537867	741789	957520

Method 1 Scenario 2: Variable Rate of Growth

Table 6.11 Projected population of nine villages for the years 2018, 2023, 2033 and 2043 assuming variable rate of growth

Name of the Village	Projected population			
	2018	2023	2033	2043
Ambegaon Budruk	67752	71817	78999	86899
Ambegaon Khurd	35544	39809	47771	57325
Dhayari	36758	49624	74435	104210
Hadapsar	46981	63424	95136	123676
Lohgaon	122627	165546	248319	347646
Mundhwa	68376	81709	106222	138088
Shivane & Shivane Uttam Nagar	55410	58735	64608	71069
Undri	30280	38516	53923	72796
Total	457728	568180	769413	1001709

Method 2: Growth of the Villages

These computations are based on the growth of population in the villages taking into consideration natural growth (driven by fertility & mortality) & migration.

Table 6.12 Projected population of nine villages for the years 2018, 2023, 2033, and 2043 using growth of the villages

Name of the Village	Projected population			
	2018	2023	2033	2043
Ambegaon Budruk	67752	71059	78166	85983
Ambegaon Khurd	35544	43532	65299	97950
Dhayari	36758	45019	67529	101293
Hadapsar	46981	57539	86310	129466
Lohgaon	122627	212396	318593	477889
Mundhwa	68376	83743	125614	188420
Shivane & Shivane Uttam Nagar	55410	58116	63925	70316
Undri	30280	42823	64234	96351
Total	457728	595227	849670	1227668

Method 1 Scenario 1 that is based on availability of developable land does not give fairly accurate projections as the population is projected considering the rate of growth constant for all the villages even though the growth potential is different for different villages.

Method 1 Scenario 2 that is the population increase based on the availability of land and growth potential of each village, gives realistic figures.

Method 2 based on natural growth (driven by fertility & mortality) and migration does not give reliable projected figures due to distortion in natural growth caused by migration of mainly male population for work.

Hence, as per the recommendations of the Gokhale Institute of Politics and Economics (GIPE), the projected population for the nine villages, prepared using Method 1 – Scenario 2 and based on the availability of developable land and growth potential, has been referred to while formulating the proposals for these villages.

In view of the extended planning period up to the year 2045, the population projections for the years 2025, 2035, and 2045, derived using the same method, are presented in the Proposed land use chapter (refer Table 13.2) and have been adopted for planning purposes. This approach ensures that the Development Plan remains consistent with the recommendations of GIPE while presenting a realistic and updated demographic scenario,

reflecting both the availability of developable land and the growth potential of the newly merged villages.

6.4 Age- Sex Distribution of the Population in Nine Villages 2023, 2033 and 2043

Age and sex distribution of projected population for year 2023, 2033, 2043 based on the population projected using Method 1 Scenario 2 are given in the following tables.

Table 6.13 Projected age distribution of population by broad age groups by 2023

Village	2023			
	0 to 14 Years	15 to 59 Years	60+ Years	Total
Ambegaon Budruk	12552	49505	9760	71817
Ambegaon Khurd	6958	27441	5410	39809
Dhayari	8673	34207	6744	49624
Hadapsar	11085	43720	8619	63424
Lohgaon	28933	114115	22498	165546
Mundhwa	14281	56324	11104	81709
Shivane & Shivane (Entire Uttam Nagar)	10265	40488	7982	58735
Undri	6732	26550	5234	38516
Total	99479	392350	77351	568180

Table 6.14 Projected age distribution of population by broad age by 2033

Village	2033			
	0 to 14 Years	15 to 59 Years	60+ Years	Total
Ambegaon Budruk	12660	53555	12784	78999
Ambegaon Khurd	7656	32385	7731	47772
Dhayari	11929	50461	12046	74436
Hadapsar	15246	64494	15396	95136
Lohgaon	39795	168339	40185	248319
Mundhwa	17023	72010	17190	106223

Shivane & Shivane (Entire Uttam Nagar)	10354	43799	10455	64608
Undri	8641	36555	8726	53922
Total	123304	521598	134513	769415

Table 6.15 Projected age distribution of population by broad age groups by 2043

Village	2043			
	0 to 14 Years	15 to 59 Years	60+ Years	Total
Ambegaon Budruk	13926	58910	14063	86899
Ambegaon Khurd	9187	38861	9277	57325
Dhayari	16700	70646	16864	104210
Hadapsar	19820	83842	20014	123676
Lohgaon	55712	235675	56259	347646
Mundhwa	22129	93612	22347	138088
Shivane & Shivane (Entire Uttam Nagar)	11389	48179	11501	71069
Undri	11666	49350	11781	72797
Total	160529	679075	162106	1001710

Projected age distribution for the years 2023, 2033, and 2043 shows an increasing population across all age groups - 0-14 years, 15-59 years, and 60+ years - with the most rapid growth observed in the elderly 60+ years group. This indicates an overall growing population with a significant rise in the elderly demographic compared to 2018. The sex distribution of the population, based on the household survey and technical projections, follows a similar trend for the years 2023, 2033, and 2043 as observed in 2018.

6.5 Conclusion:

The growth rate of the nine villages is 3.96 % which is much higher than that of 2.08 % of old Pune city. The fact that Fringe areas grow faster is reflected here too. Villages like Ambegaon Khurd, Undri and Shivane grew very fast, at about 10 %.

The number of females are less in the nine villages. The Average household size is 3.6. Share of the working-age population is more while children under 15 years and the elderly are less. About 30 % of the population belongs to the 'student' category out of which 70 % are school-going. Illiterates are 7.93 % while 57 % of the educated have completed at least

SSC and over 18 % are either graduate or postgraduate. Most of the workers are in the private sector with few still engaged in agriculture, especially in Undri.

Among the migrants, more than three fourth of the respondents migrated themselves, and in 15 % cases, their father migrated. As expected, migration is for work as expressed by 90% of them. Most of the migration, 84% is within the state.

CHAPTER 7 : SOCIO-ECONOMIC STUDY

Introduction

Pune is one of the fastest-growing cities in India. Rapid changes in land use and their associated challenges-such as increasing population density, traffic congestion, and deteriorating levels of urban services-are becoming more complex with time. Similar trends are evident in the nine fringe villages, where migration to peri-urban areas has significantly influenced their socio-economic and cultural characteristics. To assess the prevailing socio-economic conditions and to understand people's perceptions, expectations, and aspirations regarding facilities and services, a survey was conducted by the Gokhale Institute of Politics and Economics (GIPE), Pune. The key findings from the Socio-Economic Survey Report prepared by GIPE are summarized below.

7.1 Methods of Data Collection

Three different data collection methods deployed for the survey:

1. Observation method. (Visual survey of nine villages)
2. Primary data collection from Household Survey of nine villages.
3. Public Participation Meetings at Pre-Planning stage.

7.1.1 Observation method (Visual Survey of Nine Villages)

Village-wise observations regarding current status of nine villages summarized as follows:

Table 7.1 Current status of nine villages

Village	Context of area Prominent land use	Density and pattern of development	Quality of Amenities	Environment al quality	Scope for Improvement
Ambegaon Bk	Located on the southern side of Pune city and the eastern side of the old Pune-Satara highway. The entire area has mixed land use development. Along the Mumbai-Bangalore bypass, the industrial area does not have any buffer to adjacent residential areas.	Significant development. In a major portion of the area, narrow lanes are seen with hawkers at many places, further reducing the right of way. Apart from housing societies, the area does not follow any defined road pattern; sometimes, the road junctions are at acute angles, forming blind junctions.	The area lacks open space, gardens & sports facilities.	Due to less side margins, lower floors do not get direct sunlight, leading to poor environmental conditions. Random dumping of solid waste and open drains at places.	Less vacant land is available for new development. The focus of infrastructure development: Improvement of the stormwater drain, by proper gutters along roads Solid waste management Road widening and development of service lanes along the highway to avoid random movement of vehicles.

Village	Context of area Prominent land use	Density and pattern of development	Quality of Amenities	Environment al quality	Scope for Improvement
Ambegaon Kh	The area is located on the southern side of Pune city & on either side of Mumbai - Bangalore bypass . Predominant residential development, with mixed land use development along the highway. Scattered Development due to topographical pattern and quarries. The general slope is towards the north, with higher elevation on the south. There are also natural features like the lake and steep slopes.	The average density of development is low. On the western and southern side, a lot of plotted development is seen coming up. This plotted development does not seem to follow the norms of mandatory open space, amenity area, etc. In case of emergency, the area does not have sufficient entry and exit points.	The area lacks open space, gardens, sports facilities, cultural centres, and necessary social infrastructure, like a post office, police station, etc.	Due to quarrying activity and the national highway, the area experiences dust problems.	The quarrying activity should be stopped entirely, as it negatively affects the health of the people. A disaster management plan should be in place in surface runoff, as the southern side has a steep slope and less plantation. All necessary Municipal facilities are required in the area, like, Solid waste collection system, Potable municipal water connection network, Health facilities. Revitalization of Jambhulwadi lake front as public spaces for the local area, Stormwater management should be such that the discharge is towards Jambhulwadi Lake.
Dhayari	Development is concentrated in the northern region. The extreme southern part is elevated and has many quarries. A vast Central stretch of land is under cultivation.	Medium-rise, medium density development in the northern part of the area. There are connecting roads in the developed area, but are narrow, disastrous for emergencies.	Schools, public gardens, open spaces, sports facilities, and other social infrastructure are absent.	The wind carries dust formed by quarrying towards the residential area. Except in the planned hsg societies/ projects, side margins are less than prescribed.	The quarrying activity should be stopped and converted to city level biodiversity parks.
Hadapsar	The area is located on the eastern side of Pune city and accessible from the Pune-	The area appears to be a high-rise medium density development.	Amenities, like gardens, open space, cultural places, are	Environmental quality is better in Hadapsar, except for areas where	Significant intervention is required to storm water drainage systems. Public gardens with children's play areas

Village	Context of area Prominent land use	Density and pattern of development	Quality of Amenities	Environment al quality	Scope for Improvement
	Solapur highway. About 35 to 40 % of the area is already developed with mixed land use and housing projects. Commercial areas along major roads support the village.		confined to Gated communities. Other standard amenities are available.	the all-weather roads are not developed.	should also be prioritized. Proper road sections that avoid pedestrian and vehicular conflicts should be designed.
Lohgaon	The area is located in the northeastern part of Pune city, with predominantly residential development	The area has a more significant portion of air force related ancillary facilities, including the same housing.	Schools, gardens, open spaces, sports facilities and other social facilities are absent.	Lohgaon has better environmental quality. The existing development is sparse.	Low-rise, medium-density should be promoted due to the vicinity of AirPort. Institutional development can be promoted. Parks and gardens can be developed along the edge of Harantale Lake.
Mundhwa	The area is on the eastern side of Pune city, accessible from Ghorpadi road. A large amount of land is still vacant, except for Keshav Nagar, Mayureshwar colony and Sasane colony, which are on the western part of the area.	The internal road pattern with the village is random and somewhat follows the agricultural plot pattern. Some of the roads meet at acute angles.	Public gardens, open spaces, sports facilities and other social facilities are absent.	Environmental quality is better comparatively among nine villages, except where dusty/kutcha roads.	Scope for developing social or low LIG housing along with necessary amenities. The area is also ideal for developing research institutes and like, due to vacant land availability.
Shivane	Densely developed area on the south-west of Pune city accessed by NDA road. Largely having small scale industries and warehouses	Low-rise high-density development, with almost no vacant land availability.	The area doesn't have any open space or other public amenities. Except for two ZP schools, Private	Dense development has led to low environmental quality. Random solid waste disposal along the Road	For buffer and proper river edge management, ease the traffic along the NDA road and better connectivity with the city, a road along the river can be proposed. Riverfront parks can be proposed Appropriate road sections should be developed for

Village	Context of area Prominent land use	Density and pattern of development	Quality of Amenities	Environment al quality	Scope for Improvement
	apart from the residential area..		schools hardly have playgrounds.		public parking and to avoid pedestrian-vehicular conflict along the NDA road.
Undri	The area is on the south-eastern side of Pune city. Primarily developed as a residential area, with major access from Katraj-Hadapsar bypass road. The southern part of the area still has agricultural activity	Medium rise low-density development. The current road network follows the agricultural land pattern. The average slope of the area is towards the north.	Public parks, gardens and cultural centers are absent. Children's play areas, etc. are only present in private housing complexes.	Environmental quality is better except along the Katraj-Hadapsar bypass road. This area also has less green cover/vegetation.	Natural features like small lakes, low-lying areas should be conserved. It can be done by creating an open space system along the low-lying area. A proper water supply scheme should also be facilitated.

7.1.2 Household Survey of Nine Villages

A sample survey covering 3,484 households from nine villages was conducted for detailed primary data collection, as described in the earlier chapter on Demography. The Probability Proportional to Size (PPS) technique was adopted to ensure representative sampling. The data gathered through this survey has been utilized to assess the socio-economic conditions of the population across multiple dimensions, including demographic parameters, education, occupation, and income (indicating economic status), as well as housing, amenities, and overall standard of living.

i) Demography

The demographic characteristics of the population in nine villages are summarized as follows:

- a) The average household size ranges from a minimum of 2.3 persons in Dhayari to a maximum of 4.6 persons in Lohgaon. Villages such as Ambegaon Budruk, Ambegaon Khurd, Dhayari, Shivne, Shivane (UT), and Undri have a higher proportion of households compared to their share of the total population.
- b) All the villages are predominantly Hindu, accounting for 90.8 percent of households, followed by Muslim households at 4.4 percent, and households belonging to other religions at 4.8 percent. Information on caste was reported by 66.6 percent of the surveyed households.
- c) The age composition of the population indicates that approximately 9 percent are below six years of age, around 19 percent belong to the school-going age group, and about 67 percent fall within the income-earning age group of 18–60 years.

- d) Marital status data shows that 59 percent of the population is married. In about 29 percent of households, the head of the family is female, with the highest proportion observed in Mundhwa, where approximately 41.5 percent of households are headed by women.

ii) Education

The level of education is a key indicator of social development. The population in the nine villages reflects educational attainment patterns that are broadly comparable to those observed in Pune city.

Table 7.2 Percent distribution of the population by educational level and village

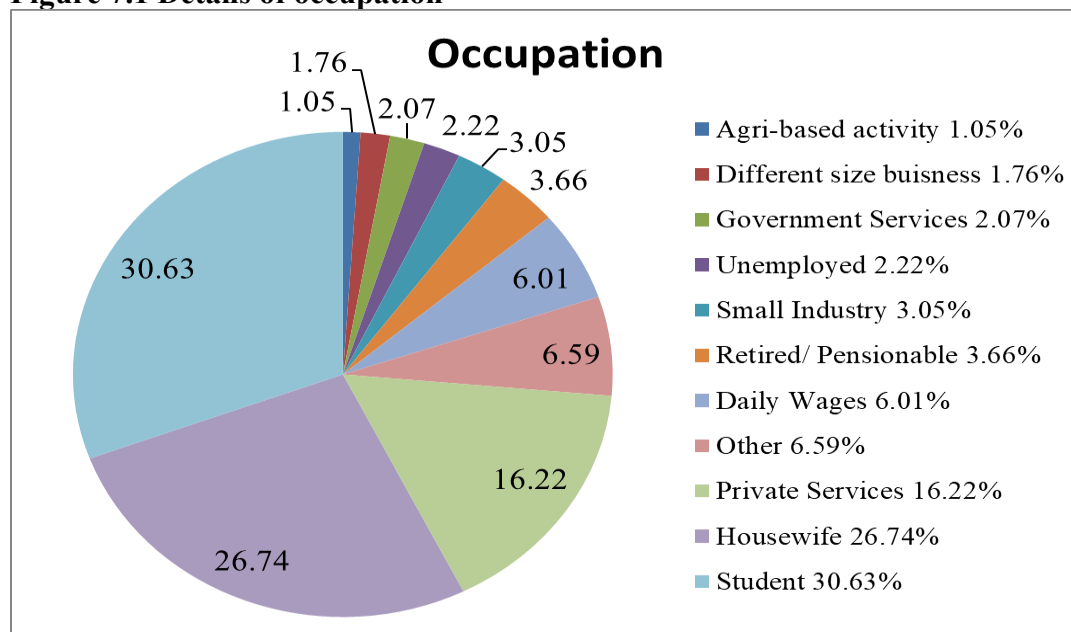
Village	Educational level									Total
	Illiterate	Pre-Primary	Primary	Secondary	SSC	Higher Secondary	Diploma / ITI	Graduate	Post graduate and above	
Ambegaon Bk	9.8	4.6	6.8	13.4	15.5	22.5	6.0	15.6	5.7	1383
Ambegaon Kh	6.9	4.2	5.2	11.7	12.6	15.2	5.8	34.1	4.3	669
Dhayari	2.7	4.0	3.2	4.8	15.6	18.6	4.2	45.9	1.0	1107
Hadapsar	10.6	7.1	14.4	19.4	19.4	15.2	2.3	9.6	1.9	1234
Lohgaon	13.5	4.7	13.0	16.7	17.8	15.2	1.6	13.4	4.0	3022
Mundhwa	11.5	5.9	11.4	16.5	19.4	17.8	2.8	12.2	2.7	2573
Shivane	7.6	5.1	3.8	10.4	17.4	18.1	5.2	28.4	4.1	1024
Shivane (UT)	6.8	5.6	7.0	13.6	18.8	25.4	7.2	13.4	2.3	485
Undri	14.9	6.2	7.4	12.0	19.6	17.4	5.0	15.1	2.3	516
Total	10.9	5.1	9.9	14.3	17.3	17.80	3.9	18.6	3.0	12013

In all the villages, approximately 50 percent of individuals have studied up to the high school level. The relatively lower levels of higher education highlight the rural background and transitional character of these settlements.

iii) Occupation

The types of occupations in which residents are engaged serve as an indicator of the level and pattern of urbanization. Detailed information on occupation and income for the nine villages is presented in Figure 7.1 and Table 7.3.

Figure 7.1 Details of occupation



As seen, 27% are housewives; 31% are students, 3.7% are retired persons, and 2.2% are unemployed showing dependency. A tiny share of about 1.05% is in agriculture and related activities. Declining agricultural occupations are indicators of urbanization.

iv) Income

The maximum, minimum, and average household incomes provide an indication of the economic status and spending capacity of citizens, which in turn reflects their overall standard of living.

Table 7.3 Village wise distribution by the average monthly income (occupation wise)

Village	Agri. based occupation	Different size Business	Govt. Service	Small Industry	Daily wage	Private Service	Others	Female	Male	Total Household income
Ambegaon Bk	1898	22331	35633	20233	16817	19655	14006	17856	20157	19816
Ambegaon Kh	4517	23323	35600	23411	11905	24096	23900	17686	23871	22354
Dhayari	3252	25164	36546	20984	18688	23920	40000	22011	25785	25135
Hadapsar	2831	27143	24500	16681	10267	14732	26462	10478	16198	15442
Lohgaon	3646	14818	30262	17407	11562	17509	15894	13476	17863	17081
Mundhwa	1992	19857	27550	13973	10309	16818	13741	13269	15970	15541
Shivane	4280	17959	33761	20683	12266	20297	18636	18022	20493	20246

Shivane (UT)	6514	17429	26567	15436	14889	20418	0	17929	19801	19552
Undri	5406	13907	26556	15788	14161	20877	17500	16230	18853	18358
Average	3815	20215	30775	18288	13429	19814	18904	14152	16329	19281

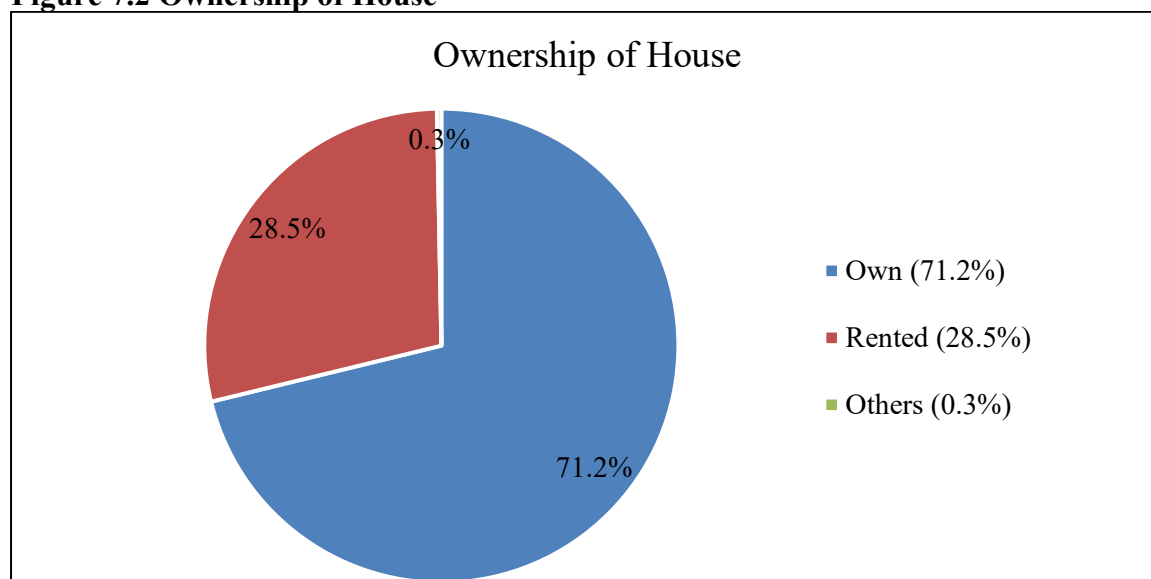
v) Housing and Amenities

Housing is an important economic indicator of prosperity. The availability of facilities such as toilets, hygiene, ventilation, sunlight, drinking water, solid waste management, transportation, and social amenities like healthcare, education, recreation, and markets reflects the overall quality of living.

The details of housing in the nine villages are elaborated in the following chapter on *Housing Study*. From a socio-economic perspective, aspects such as ownership or rental status, affordability, structure, type and size of dwelling, availability of a separate kitchen, toilet and sanitation facilities, and source of drinking water are discussed here.

a) Ownership Status of Housing: In the nine villages, the majority of households with ownership are native residents. Migrants, particularly those in the early stages of settlement, along with the floating population comprising students, temporary workers, and employees with transferable jobs, generally opt for rental accommodation. The distribution of ownership status of housing in the nine villages is illustrated in the following figure.

Figure 7.2 Ownership of House



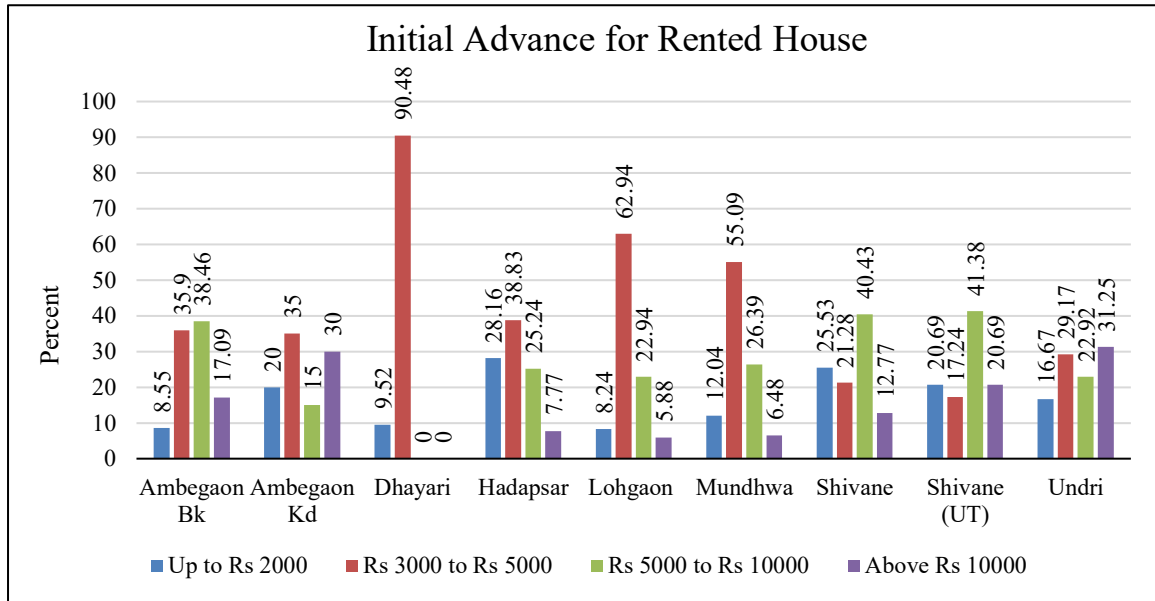
(Others indicate houses provided by company/relative etc.)

b) Rental Housing Status: As shown in Figure 7.2, rental housing accounts for 28.5% in the nine villages. From a socio-economic perspective, both the amount of rent and the nature of initial payments-such as commission, deposits, pagadi, and brokerage-are

important considerations in understanding the affordability and accessibility of rental housing.

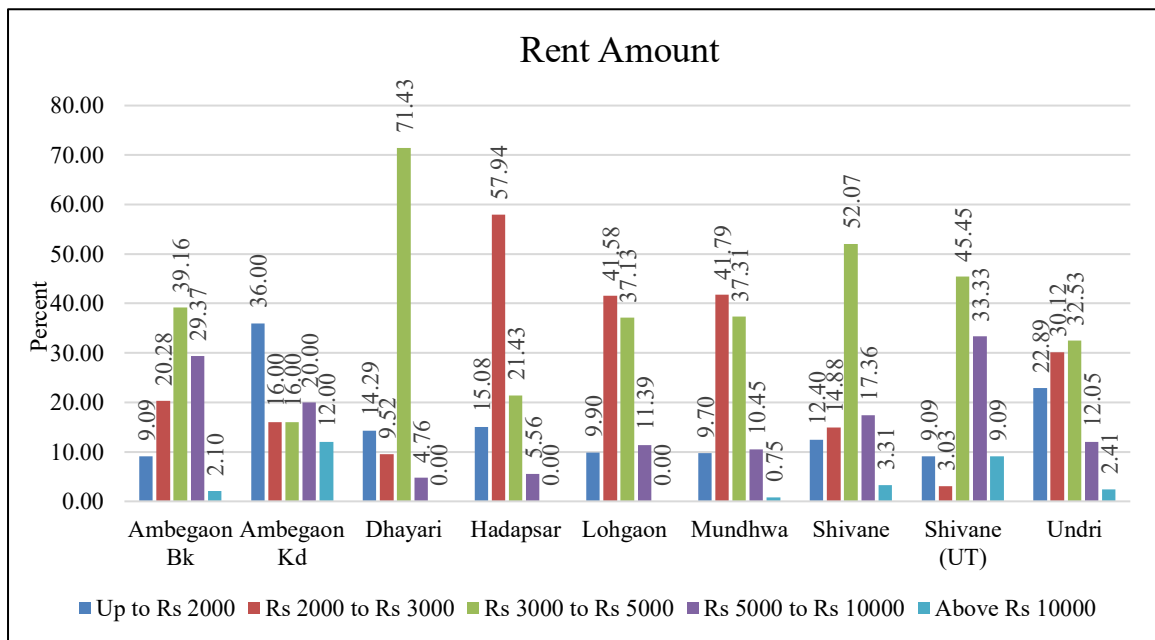
Figure 7.3 presents village-wise data on the initial advance paid for rented houses. The bars in the chart represent the percentage of households that paid advances within specific ranges. In the nine villages, the initial advance for rental housing is observed to range primarily between ₹2,000 and ₹10,000. Among these, Undri records the highest proportion of rented houses requiring advance payments, whereas Dhayari shows the lowest.

Figure 7.3 Village wise distribution by an initial advance amount for a rented house



Following chart shows the village wise distribution of the rent amount for a rented house.

Figure 7.4 Village wise distribution by rent paid



Source: Household Survey

(The bars represent the percentage of households paying within the specified range of amounts). The rent in the nine villages is observed to fall primarily within the range of ₹2,000 to ₹10,000.

- c) Housing Affordability:** Housing Affordability can be defined as the cost of housing services in relation with the household's disposable income (for tenants and owners). Ideally the house is considered affordable if monthly rent/ EMI on housing loan is less than 30% of net household income.

i) Rental housing

In the nine villages, an average of 71 percent of the houses are owned by occupiers, with the average size of houses being 300-500 sq. ft. (typically 3 rooms or 1BHK). Monthly rent ranges between ₹2,000 and ₹10,000. As most tenants pay relatively low rents, the average rent works out to around ₹3,000, as per the Housing Survey Report by the Gokhale Institute of Politics and Economics, Pune. The average household income in the nine villages is ₹19,281. Since the average rent of ₹3,000 is well within 30 percent of the average household income, rental housing for low-income groups in these villages can be considered affordable.

ii) Owned housing

The ready reckoner rates published by Govt. of Maharashtra reveal a big disparity in the cost of housing in nine villages among No-Development zone/ Hill top-hill slope zone and Residential zone along major roads, in vicinity of the present residential development.

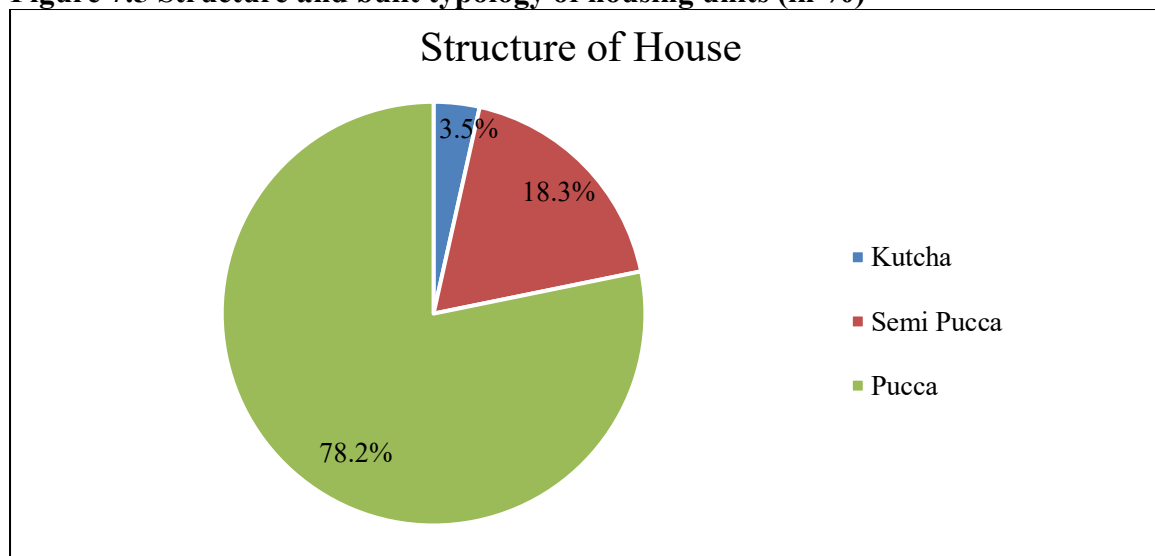
Table 7.4 Ready reckoner rates in the nine villages

RR rate (2022-2023)	For Vacant Land			For Residential Flats/ Apartments		
	Maximum rate	Minimum rate	Average rate	Maximum rate	Minimum rate	Average rate
Lohgaon	8290	4160	6245	54400	43720	49060
Mundhwa	17750	2868	11986	58680	58680	58680
Hadapsar	20510	13630	17060	75560	63550	69555
Undri	9990	1364	5253.5	53570	34090	43830
Ambegaon Bk	17330	2406.25	9385.25	66290	33710	50000
Ambegaon KH	8280	1892.9	3443.01	55590	35990	45790
Dhayari	19989	2240	9164.833	54370	36120	45245
Shivane	12820	2451.4	8396.28	46920	34930	40925

From an affordability perspective, 3-room/1BHK tenements with sizes ranging between 300–500 sq. ft. are the most popular in the nine villages. The cost of these flats ranges from ₹18 lakh to ₹40 lakh. Considering that the average household income in the nine villages is ₹19,281 per month, the estimated EMI exceeds 30 percent of the net income. Therefore, owned housing in this category is not affordable for the majority of residents in the nine villages.

d) Structure of Housing: The structures of housing are categorized as kutcha, semi-pucca, and pucca, based on the materials used for roofing, walls, and flooring, which indicate the overall soundness of the dwelling. The type of housing structure also reflects the socio-economic status of the occupants. The following chart illustrates the percentage share of these housing categories in the nine villages.

Figure 7.5 Structure and built typology of housing units (in %)



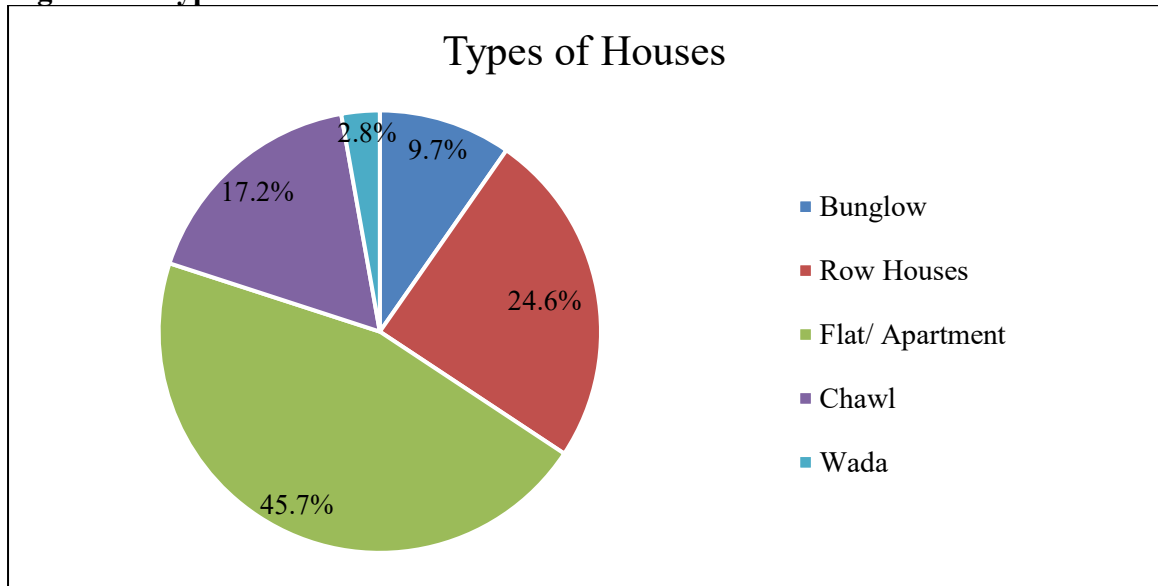
Source: Household Survey

A maximum percentage of structures, over 78%, are pucca (RCC), indicating a high degree of urbanization in the nine villages. Semi-pucca structures account for 18.3%, while only 3.5% are kutcha. The highest proportion of pucca structures is recorded in Ambegaon Budruk (91.88%) and Dhayari (91.53%). The maximum share of semi-pucca structures is observed in Hadapsar, whereas Undri has the highest proportion of kutcha houses (13%).

Type and Size of House: The type and size of housing reflect the socio-economic condition of the residents. Accommodation such as bungalows and row houses indicates an affluent economic status, while flats and apartments are the preferred housing type for middle-class households. Lower-income groups generally reside in chawls, whereas wadas are distinctive to villages, retaining their traditional rural character. Among the various types of houses, flats/apartments are the most common, holding the largest share of the housing stock. Row houses and chawls also account for a significant share, followed by bungalows. Only 2.8% of houses are in the form of wadas, indicating a large scale of

urbanization. The following chart presents the distribution of house types across the nine villages.

Figure 7.6 Type of houses

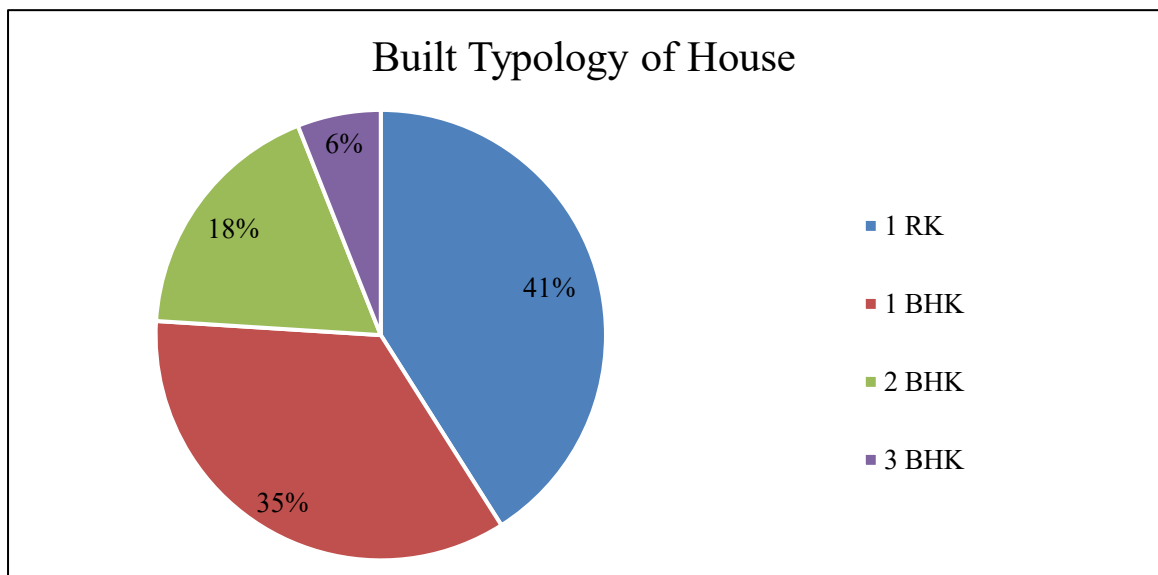


Source: Household Survey

The highest number of bungalows is located in Undri, while the lowest is in Ambegaon Budruk. Lohgaon records the maximum number of row houses, whereas only 11% are found in Shivane. In Dhayari, approximately 81% of the houses are flats/apartments. A small number of wadas are reported in Lohgaon and Shivane (UT).

Built typology is categorized into units such as one-room kitchens, 1BHK, 2BHK, and 3BHK dwellings. The following chart illustrates the distribution of built typologies in housing units across the nine villages.

Figure 7.7 Structure and built typology of housing units (in %)



Source: Household Survey

The majority of houses consist of 1RK units, accounting for 41%, followed by 1BHK units at 35%, 2BHK units at 18%, and 3BHK units at 6%. The highest concentration of 1RK houses is found in Ambegaon Khurd, Dhayari, and Shivane, whereas Lohgaon records the maximum number of 3BHK apartments.

Houses with an area of up to 300 sq. ft., indicative of units for the Economically Weaker Section (EWS), and those with a minimum area of 300 sq. ft., indicative of the Lower Income Group (LIG), together account for 12% of the total housing stock in the nine villages. Houses with an area of 300–600 sq. ft., typically associated with the Middle-Income Group (MIG), form the largest share at 45%, followed by houses with an area of 600–1200 sq. ft. Dwellings with an area above 1200 sq. ft. are relatively few, constituting only 6% of the total.

f) Amenities in Houses:

Separate room for kitchen: On average, about 82% of houses in the nine villages have a separate room for the kitchen. However, more than 20% of households in Hadapsar, Shivane, Shivane-Uttamnagar, and Undri do not have a separate kitchen space.

Toilet facility and sanitation: In Ambegaon Budruk, Ambegaon Khurd, Lohgaon, Shivane, and Shivane-Uttamnagar, more than 75% of households have toilet facilities within the house. Conversely, over 25% of households in Dhayari, Hadapsar, Mundhwa, and Undri rely on shared toilet facilities. In terms of sanitation, more than 80% of houses in Ambegaon Khurd, Hadapsar, and Mundhwa are connected to drainage lines, while around 25% of houses in Ambegaon Budruk, Shivane-Uttamnagar, and Undri remain unconnected.

Source of drinking water: The sources of drinking water in the nine villages include piped water, borewells, wells, rivers, lakes/ponds, tankers, and bottled water. More than 74% of households, except those in Undri (32.58%), receive piped water supply from the government’s drinking water system. In Undri, about 13% of households continue to depend on tanker supply. A small proportion of households in Undri (3.93%) and Dhayari (2.06%) use well water as their source of drinking water, while very few households in Ambegaon Khurd, Dhayari, Shivane, and Shivane-Uttamnagar rely on lakes, ponds, or rivers.

Standard of Living: The standard of living is shaped by both tangible factors such as material goods, facilities, and amenities, and intangible factors such as quality of life, safety, economic opportunities, and freedom. For the purpose of this report, emphasis is placed on tangible aspects including earnings, assets, affordability, and the availability of facilities and amenities. Detailed data on earnings and facilities/amenities has been discussed earlier. The following chart illustrates the asset holdings of residents in the nine villages, which serve as an indicator of the financial condition of households.

Table 7.5 Asset holding as per the census and household survey

Household Survey	TV	Refrigerator	Washing machine	Radio	Fan Cooler	Mobile	Gas	Computer	2W	3W	4W
Yes	90.33	53.64	7.07	1.01	74.68	80.59	78.38	4.37	44.15	2.57	5.02

No	7.42	33.57	77.84	81.17	11	6.79	7.88	78.43	37.8	78.47	76.04
NR	2.26	12.79	15.09	17.82	14.32	12.61	13.74	17.20	18.05	18.96	18.93
Census 2011	88.02	NR	NR	50.28	NR	64.59	NR	21.75	58.92	NR	21.17

NR*: No Response, Source : House hold Survey (Socio Economic Study)

The asset holdings reveal a working class of people with moderate earnings. Minimum use of radio shows changing trends and choices being available for entertainment with progressing technology. Very small number of washing machines shows the humble standard of living of the majority of residents in nine villages.

7.1.3 Public Participation Meetings at Pre-Planning stage

The 74th Constitutional Amendment Act emphasizes the participation of local residents in the Development Plan process, both at the pre-planning stage and during implementation. In line with this principle, pre-scheduled and well-publicized public meetings were organized by the Gokhale Institute of Politics and Economics in each of the nine villages at the pre-planning stage. Public notices in newspapers and posters were used to inform and invite residents to these meetings. The primary objective was to understand villagers' perceptions of existing amenities, along with their aspirations and expectations from the proposed Development Plan. Residents' priorities were also identified and documented during these consultations. The response to these public meetings varied across the villages, with a total of 455 residents participating. The highest level of participation was recorded in Mundhwa, while Shivane (UT) witnessed the lowest turnout.

Figure 7.8 Public meeting at Ambegaon Bk



Figure 7.9 Public meeting at Lohgaon



Figure 7.10 Public meeting at Shivane



The village wise details of participants in public meetings is given in the following table.

Table 7.6 Village wise distribution of the participants in the public meeting

Village	Number of the participants	Participation (in percent)
Ambegaon Bk	39	8.57
Ambegaon Kh	38	8.35
Dhayari	47	10.33
Hadapsar	44	9.67
Lohgaon	87	19.12
Mundhwa	109	23.95
Shivane	47	10.33
Shivane (UT)	12	2.64
Undri	32	7.03
Grand Total	455	100

7.2 Perception of People in Nine Villages

It is important to understand residents' opinions regarding existing and expected services, facilities, and amenities, as these perceptions shape their views about present conditions and the provisions of the Proposed Development Plan. During the public meetings, efforts were made to capture public perception across 16 different categories of existing amenities. The following table presents a summary of residents' feedback on the availability and adequacy of amenities in all nine villages.

Table 7.7 Perception about the amenities available at all the villages

Grading	Good	Fair	Unsatisfactory	Not Available
Health	7.48	23.81	29.08	39.63
Cleanliness	9.18	31.29	39.63	19.9
Garbage Processing	8.67	29.25	42.69	19.39
Transportation	7.99	22.96	46.26	22.79
Water Supply	7.48	15.31	48.3	28.91
Educational Institute.	15.31	37.41	27.55	19.73
Drainage	11.73	29.42	36.9	21.94
Road	5.61	19.56	52.04	22.79
Play Ground	5.61	19.56	52.04	22.79
Park	1.19	3.91	23.13	71.77
Cultural Centers	0.51	2.21	19.56	77.72
Emergency Services	3.74	8.84	26.36	61.05
Employment	7.14	23.3	33.84	35.71
Housing	2.04	11.39	28.57	57.99

The analysis of participants' perceptions from the public meetings indicates that respondents are largely dissatisfied with the overall status of infrastructure, amenities, and facilities in the nine villages. Recreational facilities such as parks, playgrounds, and cultural centers, followed by emergency services and housing, received the poorest ratings, being reported as either absent or unsatisfactory across most villages. A majority of respondents also expressed dissatisfaction with the availability and quality of essential services such as water supply, healthcare facilities, roads and transportation, cleanliness, drainage, and solid waste management, which were consistently perceived as either inadequate or lacking.

7.3 Preferences of people in Nine Villages

During the public meetings, a structured questionnaire was distributed asking participants to indicate their top five preferences among 16 listed issues. The responses revealed that water-related concerns were the highest priority, cited by 76% of respondents. This was followed by health-related issues (56%), roads (51%), cleanliness (43%), and garbage management (42%). Drainage systems (40%) and public transportation (34%) also emerged as significant priorities, closely following the top five concerns.

Following table shows distribution of issues and participants preference from nine villages.

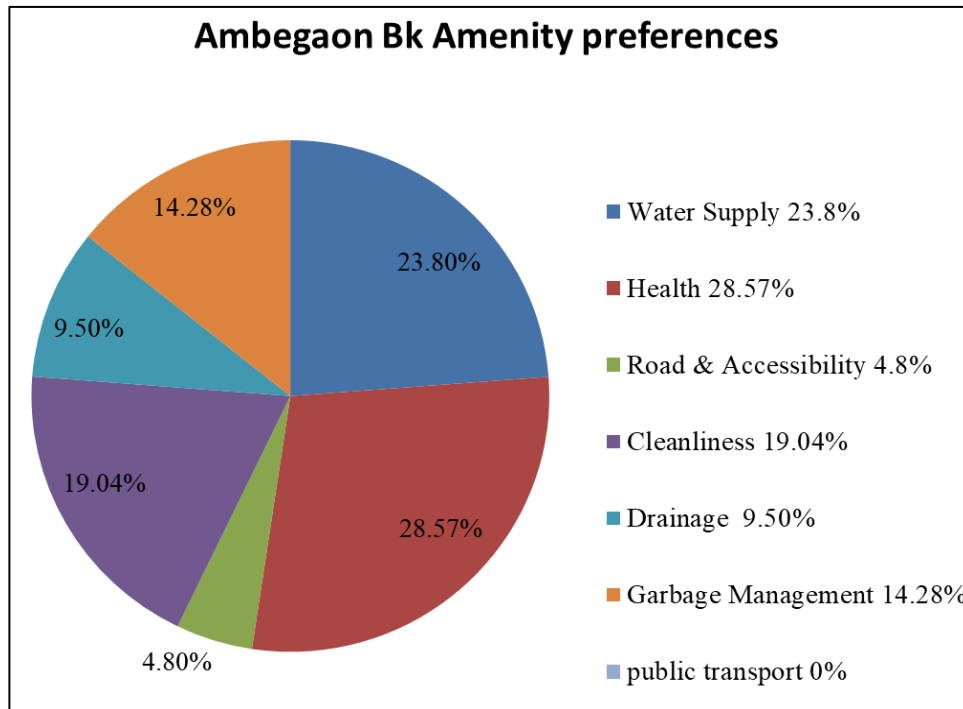
Table 7.8 Distribution of issues and participant's preference (in percentage)

Sr No	Work	Responses for the top five problems
1	Water Supply	75.68
2	Health	55.78
3	Road and accessibility	51.19
4	Cleanliness	43.03
5	Garbage Management	41.67
6	Drainage System	39.29
7	Public Transport	33.84
8	Playground	28.91
9	Park/Garden	24.15
10	Vegetable Market	19.73
11	Emergency Services	18.03
12	Electricity Supply	14.8
13	Education: School/College	13.27
14	Employment opportunity	13.27
15	Cultural Centre	11.9
16	Housing	6.63

The preference analysis for the nine villages provides critical insights into the shortfall of amenities and highlights residents' priorities for the development of new facilities. These findings serve as valuable guidelines for planners in determining the type and scale of

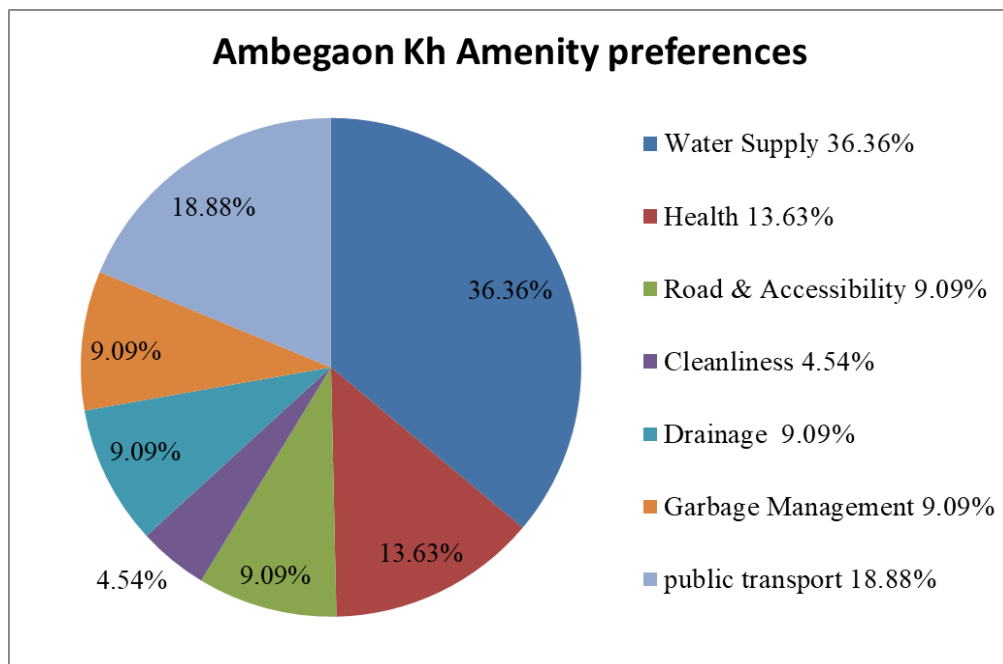
amenities to be incorporated in the planning area while preparing the Development Plan. The village-wise preferences regarding amenities, as revealed through the public meetings, are illustrated in the following charts:

Figure 7.11 Amenity preferences in Ambegaon Bk



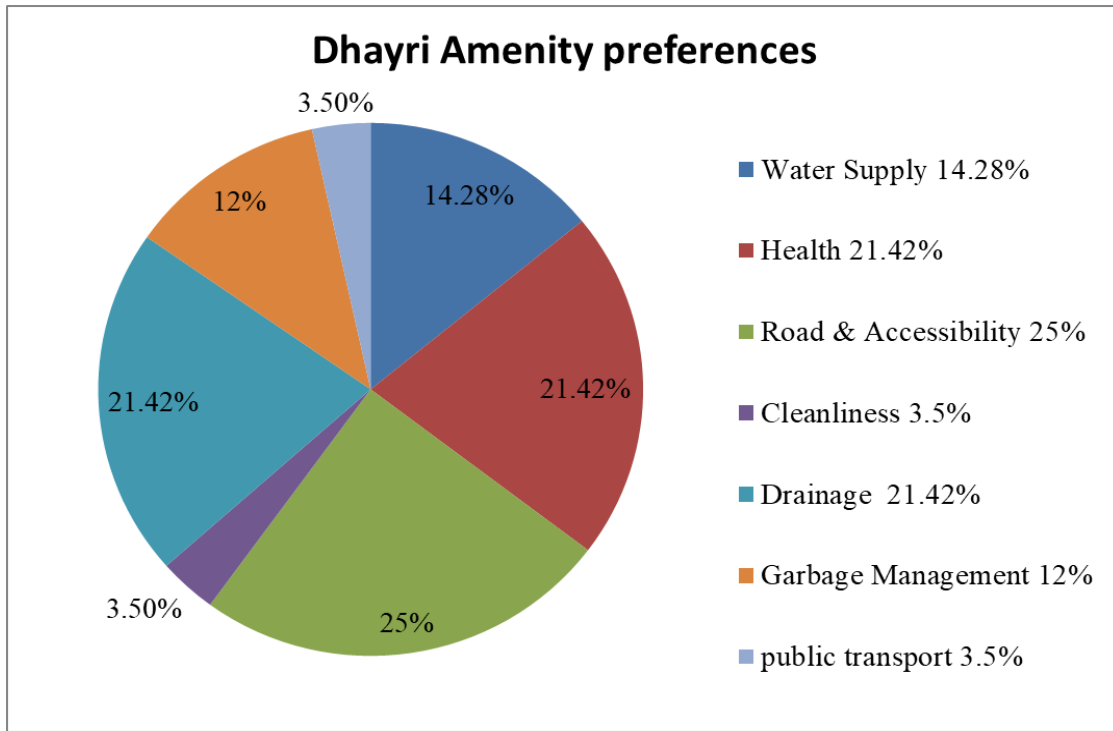
Water supply and health amenities have got the maximum preferences in Ambegaon Bk.

Figure 7.12 Amenity preferences in Ambegaon Kh



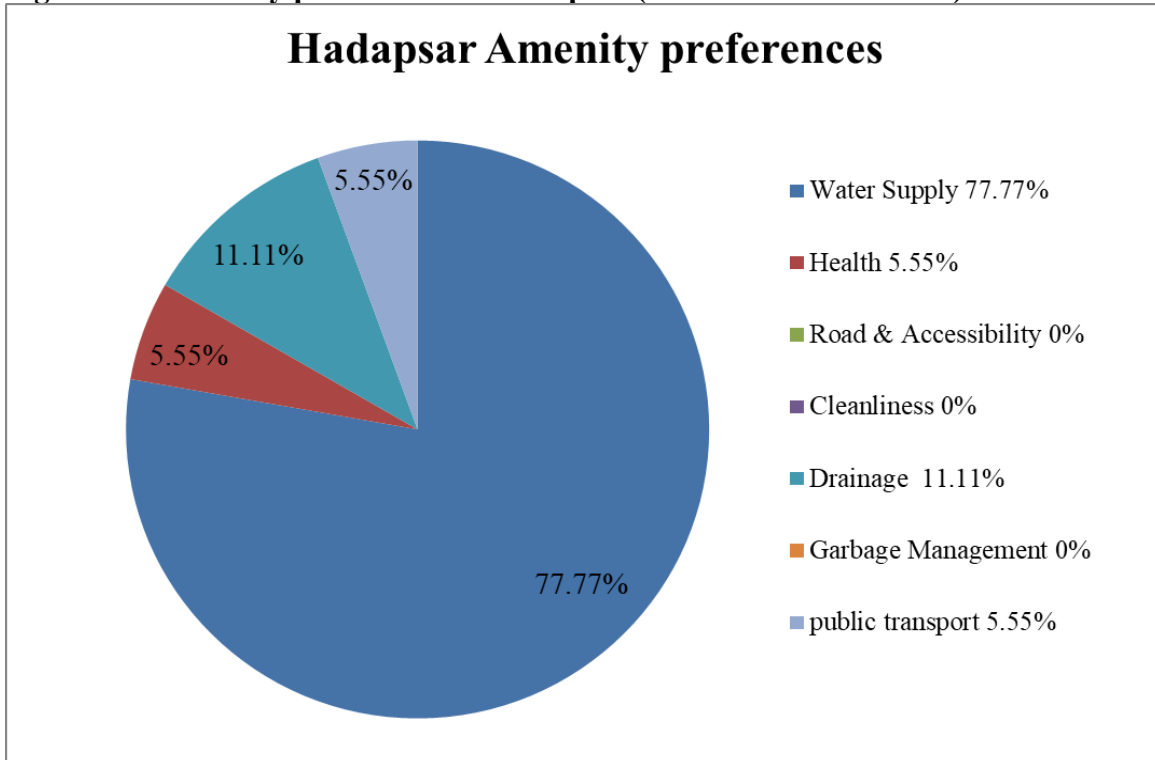
Water supply has got the maximum preference in Ambegaon Kh.

Figure 7.13 Amenity preferences in Dhayari



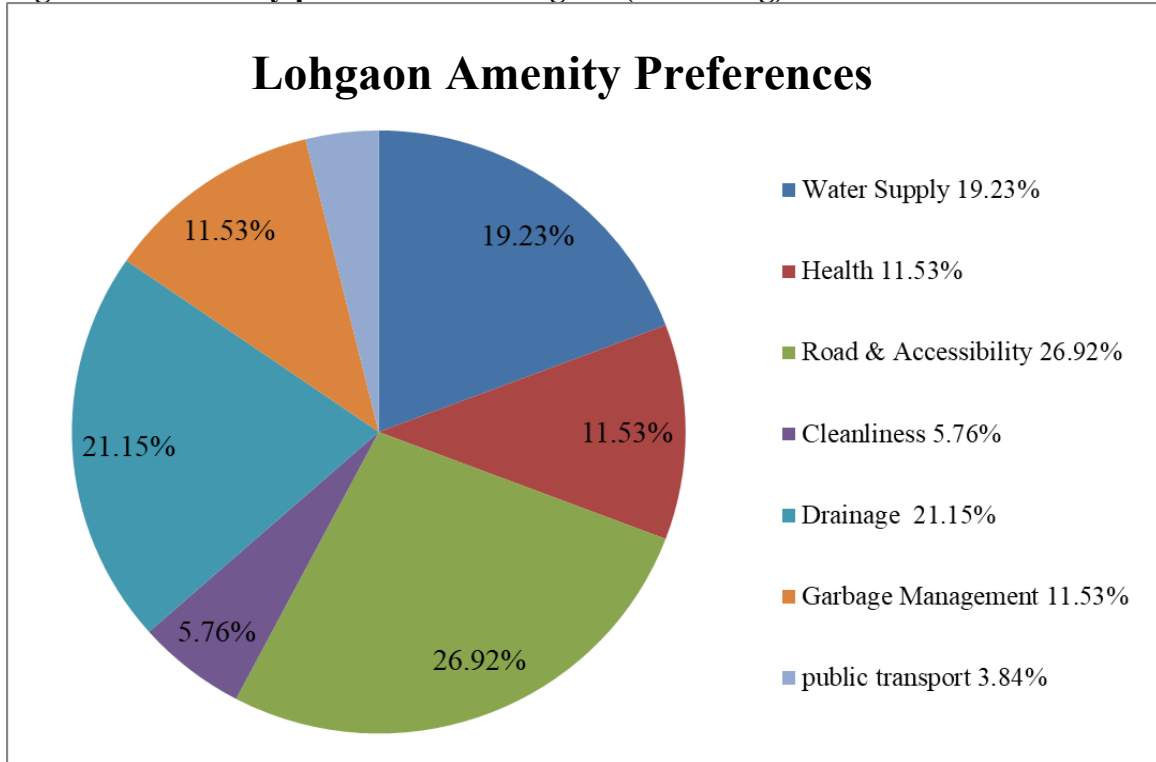
Roads, Water supply and cleanliness have got the maximum preferences in Dhayari.

Figure 7.14 Amenity preferences in Hadapsar (Entire Sadesatara nali)



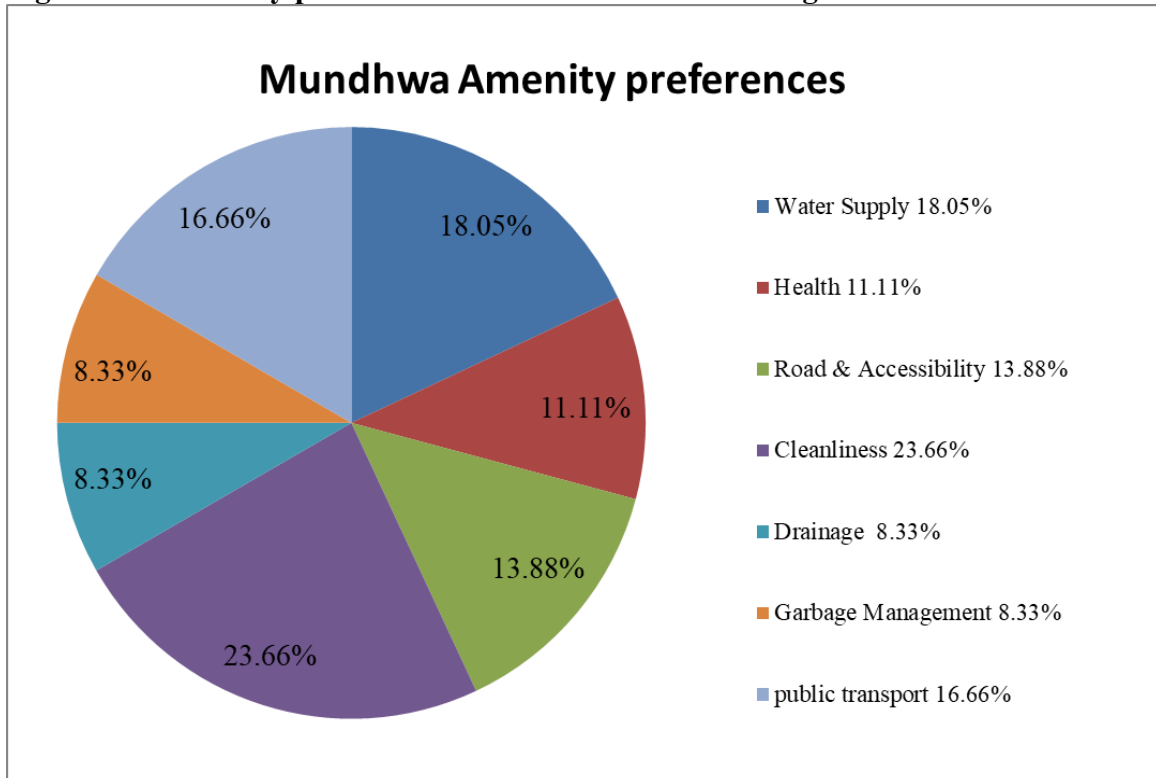
Water supply has got the maximum preferences in Hadapsar-Sadesatara nali.

Figure 7.15 Amenity preferences in Lohgaon (remaining)



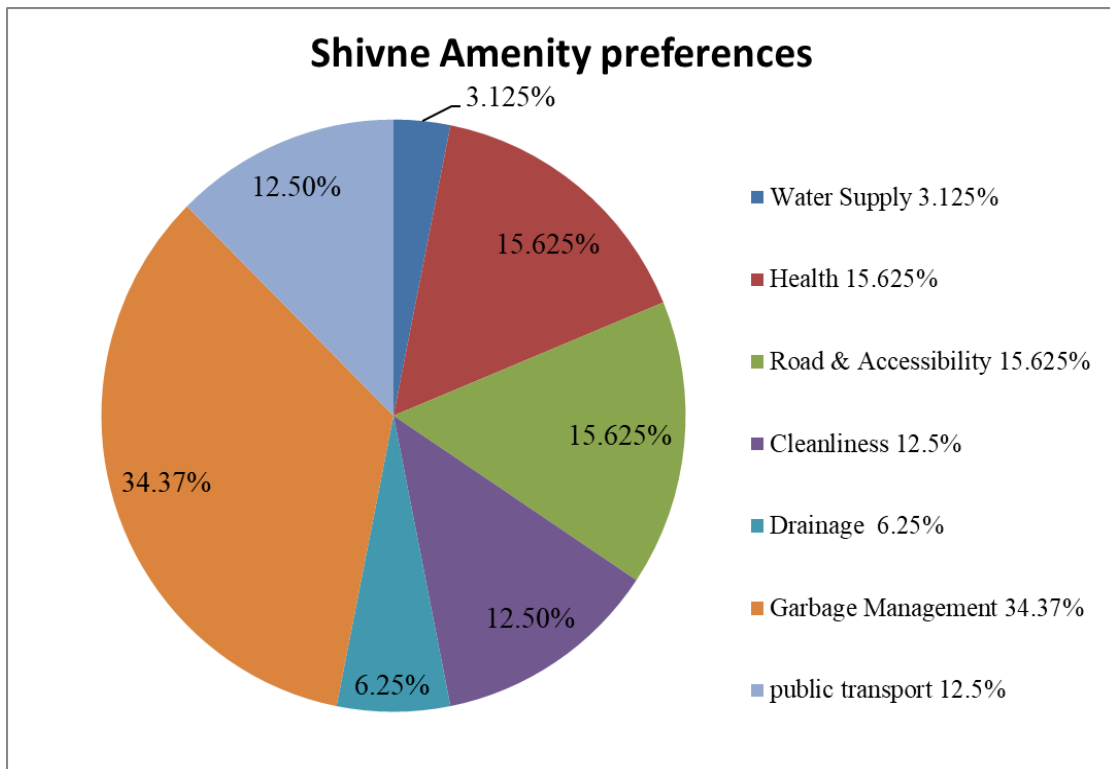
Roads, Water supply and drainage have got the maximum preferences in Lohgaon.

Figure 7.16 Amenity preferences in Mundhwa- Keshav Nagar



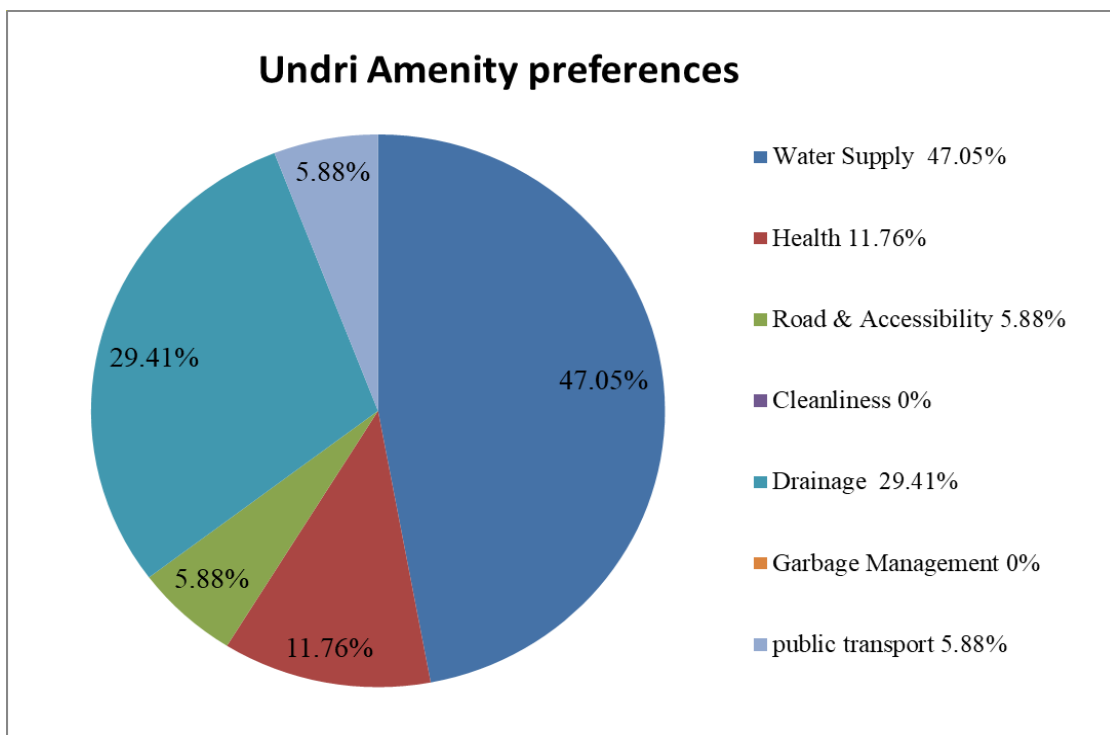
Water supply and cleanliness have got the maximum preferences in Mundhwa.

Figure 7.17 Amenity preferences in Shivane & Shivane (Entire Uttam Nagar)



Garbage management and health facilities have got the maximum preference in Shivane.

Figure 7.18 Amenity preferences in Undri



Water supply and drainage facilities have got the maximum preferences in Undri.

7.4 Suggestions of people in Nine villages

In addition to completing the questionnaire during the meetings, many participants actively came forward to discuss the issues prevalent in their respective villages. The concerns expressed were broadly categorized according to different facilities and services. The following table summarizes the key issues raised by participants in the public meetings conducted in each village.

Table 7.9 Issues raised by the people in the meetings held in each village (a)

Issues	Education	Governance				Emergency Services/Security		No. of issues discussed
		Village	Basic facilities in School	DP	PMC Tax	No New Reservation on remaining land	PMC Complaint Office	
Ambegaon Bk			Yes	Yes				2
Ambegaon Kh	Yes							1
Dhayari	Yes		Yes	Yes	Yes			4
Hadapsar	Yes		Yes				Yes	3
Lohgaon					Yes	Yes		2
Mundhwa		Yes		Yes				2
Shivane			Yes	Yes				2
Shivane (UT)	Yes		Yes			Yes		3
Undri						Yes		1
Number of time issue discussed	4	1	5	4	2	3	1	20

Source: Public Participation Meeting

Under the three broad categories Education, Governance and Emergency services it is seen that Governance is the biggest issue in the nine villages.

Table 7.10 Issues raised by the people in the meeting held in each village (b)

No	Village	Road and Public Transport			Cleanliness/Hygiene			Basic Amenities		Number of issues discussed
		Public Transport	Traffic Jam	Road	Garbage	Spraying/ Fumigation	Pig	Water	Hospitals / Health	
1	Ambegaon Bk		Yes		Yes	Yes		Yes	Yes	5
2	Ambegaon Kh	Yes	Yes				Yes	Yes		4
3	Dhayari		Yes	Yes				Yes	Yes	5
4	Hadapsar				Yes		Yes	Yes		3
5	Lohgaon		Yes	Yes	Yes			Yes	Yes	5
6	Mundhwa		Yes	Yes	Yes			Yes		4
7	Shivane	Yes		Yes	Yes					3
8	Shivane (UT)		Yes		Yes			Yes	Yes	4
9	Undri		Yes	Yes				Yes	Yes	4
Number of times issue discussed		2	7	5	7	1	2	8	5	37

Source: Public Participation Meeting

Among the issues related to Road and Public Transport, Cleanliness/Hygiene, Health services and Basic Amenities, Water was the most prominent issue.

Table 7.11 Issues raised by the people in the meeting held in each village (c)

No	Village	Public Infrastructure								Number of issues discussed
		Roads	Street lights	Electricity Supply	Drainage line	Play-ground	Garden/ Jogging Track	Crematorium	Water Tank	
1	Ambegaon Bk		Yes					Yes	Yes	3
2	Ambegaon Kh				Yes					1
3	Dhayari	Yes	Yes			Yes	Yes	Yes		5
4	Hadapsar		Yes				Yes	Yes		3
5	Lohgaon	Yes	Yes	Yes	Yes		Yes			5
6	Mundhwa	Yes	Yes		Yes		Yes			4
7	Shivane	Yes			Yes			Yes		3
8	Shivane (UT)			Yes	Yes	Yes				3
9	Undri	Yes	Yes							2
Number of times issue discussed		5	6	2	5	2	4	4	1	29

Source: Public Participation Meeting

During the meeting at Dhayari demand was put forward regarding the garbage processing plant (GPP) to be situated in Dhayari.

Table 7.12 Open Suggestions considering the representation made by several organizations

S. No	Village	Open Suggestions
1	Ambegaon Bk	Public parking, Service roads should be well constructed. Reservation can be only for essential services like a water tank and fire brigade
2	Ambegaon Kh	Social amenities like Hospitals, Gardens and Markets are required, Quarries can be converted to ecological park and lake can be developed with a proper waterfront
3	Dhayari	Dhayari is ideal for medium density development which is suitable to HIG and MIG housing, the Quarries can be developed as city level parks
4	Mundhwa	Development of an excellent public transportation system, Social Amenities preferably Playgrounds and Gardens, Riverfront development as a Public Park
5	Hadapsar	Street lights are sparking, flow in electric poles & Valve of the water pipeline is faulty due to this mud entering into the water pipeline.
6	Lohgaon	Unsatisfied with road connectivities due to restrictions of Air Force, Improvement in water supply and Social Amenities like playgrounds and gardens
7	Shivane	The main road needs to be widened with public toilets, Need proper water pipelines
8	Shivane (UT)	Proper roads with a good stormwater drainage facility, villager can use a Water stream (mutha river) for sailing
9	Undri	Good network of Water Supply and Management is required, Footpaths, Electric Crematorium should be developed & license holder hawkers to be allowed on roads

Table 7.13 Village wise distribution of top five suggestions (ranking as per the percentage of respondents who made suggestions)

Village	Improve Water Supply	Road	Hospitals	Garden	Play ground	Public Toilets	Garbage	Market	Street Light	Drain-age	School/college
Ambegaon Bk	1	3	2	4				5			
Ambegaon Kh	2	1	3	4					5		
Dhayari	3	1				2		4			
Hadapsar	1	3					2		4	5	
Lohgaon	1	2		4					5	3	
Mundhwa	1	2		3			4			5	
Shivane	3		4	1	2		5				
Shivane (UT)	1	2		4			5		3		
Undri	1	4	3	2							5

The identification of the top five prevailing problems in each village has helped to focus on specific local issues, thereby providing a clearer basis for village-level priorities during the planning process.

CHAPTER 8 : HOUSING STUDY

Introduction

The nine villages newly merged into the PMC limits have witnessed rapid growth over the last two decades, driven by high migration into Pune city and the urbanization of fringe areas. The Gokhale Institute of Politics and Economics (GIPE) has presented a housing survey report describing the current housing scenario in these villages, providing both qualitative and quantitative analyses of urbanization trends and assessing the future requirements of the population in the context of government policies and various development models.

8.1 Present Scenario in Nine Villages

The current housing scenario in Pune city may be summarized as a flourishing private housing market catering primarily to the higher-income groups, while public agencies such as SRA, MHADA, and PMC contribute only a limited share to affordable housing. The growth of sectors such as IT, automobile, and services has significantly increased employment opportunities, thereby fuelling the demand for housing units. However, escalating land prices, scarcity of developable land, and a shortage of affordable housing have collectively led to a rise in illegal settlements.

Although the UDCPR 2020 mandates that 20% of the plot area be reserved for Economically Weaker Sections (U/S 3.8.2) in plots larger than 4,000 sq. m., very few developments comply with this provision. Consequently, the nine villages face an acute shortage of affordable housing. Ironically, while land costs and housing prices remain beyond the reach of common people, there is a sizable share of vacant housing stock, accompanied by an increase in unauthorized dwelling structures and unhygienic living conditions in congested pockets

The key factors contributing to the current housing scenario in the nine villages can be summarized as follows:

Merging and Demerging of villages: In 1997, a total of 38 villages, including the 11 under reference, were merged into the PMC limits through Notification No. PMC 3096/1798/प्र.क्र.259/नवि-22, dated 11.09.1997. Subsequently, the State Government, vide Notification No. PMC 3020/1676/प्र.क्र.258/नवि-22, dated 17.11.2001, demerged these 11 villages from the PMC limits. However, during the intervening period, uncontrolled urbanization in these villages continued. Eventually, in 2017, the villages were remerged into the PMC limits.

Land Values: Rising land values in Pune city have pushed housing costs beyond the reach of the common man. As a result, residents are shifting towards fringe areas where housing is comparatively more affordable.

Migrants and Urban poor: Migrants attracted to Pune in search of employment prefer to settle in fringe areas due to lower living costs. Similarly, the urban poor, being priced out

of the formal housing market, are compelled to occupy low-value or unsuitable lands, often resorting to unauthorized encroachments on publicly owned lands in the fringes.

Lack of amenities and infrastructure: Development in the newly added villages is characterized by dense and haphazard growth, lacking adequate access roads, amenities, and open spaces as per planning standards. Existing infrastructure is inadequate to meet the needs of the rapidly increasing migrant population. Unauthorized and congested constructions on unsuitable or no-development lands further complicate the provision of infrastructure and essential emergency services such as fire safety and disaster management.

Unauthorised subdivision of land parcels: The sale of small-sized plots (as small as 1,000 sq. ft. or less) through unauthorized subdivisions has resulted in illegal constructions with minimal or no side margins, open drains, poor accessibility, violation of FSI norms, and lack of natural light and ventilation.

Implementation of Housing policies: Several housing policies at the national and state levels (e.g., NHP, NUHHP, PMAY, and Maharashtra State New Housing Policy & Action Plan) have been introduced. Effective implementation of these policies is critical for addressing housing challenges in the nine villages.

8.2 Existing Type of Housing in Nine Villages

8.2.1 Formal housing

Formal housing options in the nine villages include apartment housing, plotted developments, bungalows and row houses, chawls and wadas, and limited public housing. Market trends indicate that the supply of small housing units is lower than the demand, while the share of public housing remains negligible.

- i) **Apartment Housing:** Apartment housing is the most prominent formal housing typology in the nine villages. With the increasing privatization of housing and limited government investment in proportion to urbanization trends, apartments have become the primary formal housing option.

Figure 8.1 Apartment Housing



- ii) **Bungalow and Row houses:** Due to the scarcity of land and spiraling land values within the city, many residents of Pune shifted to fringe areas where land was more affordable for individual housing. Consequently, over the last three decades, a significant number of bungalows and row houses have developed in the nine villages. This typology continues to be a remarkable component of the formal housing stock.

Figure 8.2 Bungalow and Row Houses



- iii) **Plotted Developments:** The Maharashtra Co-operative Societies Act, 1962, provided a framework for groups aspiring for single-family homes to form housing societies, purchase land collectively, and allot plots to members. Such plotted developments are visible in all nine villages, enabling many households to fulfil their aspiration for individual houses at relatively affordable costs.

Figure 8.3 Plotted Developments



- iv) **Chawl, Wada:** Until the late 20th century, the nine villages retained rural characteristics, with individual houses and wadas dominating the landscape. Over time, some of these structures were replaced by multi-storied buildings as urbanization accelerated. Chawls also emerged as a form of affordable housing for the lower-income strata, particularly laborers, workers, and migrants. These structures are typically one or two stories, with habitable rooms arranged in a row and common sanitation facilities.

Figure 8.4 Chawl



8.2.2 Informal Housing

Large-scale informal housing is evident in the nine villages, primarily in the form of unauthorized plotting, unregulated structures, and haphazard development. Migrants and urban poor, unable to afford formal housing, often settle in congested areas with inadequate living conditions due to lower costs. Such developments are commonly found on lands unsuitable for housing, including green and eco-sensitive zones, as well as public or government-owned lands. These informal settlements are characterized by violations of building regulations, including inadequate light and ventilation, absence of marginal open spaces, and insufficient access roads, leading to unhygienic and unsafe living environments.

Figure 8.5 Informal Housing

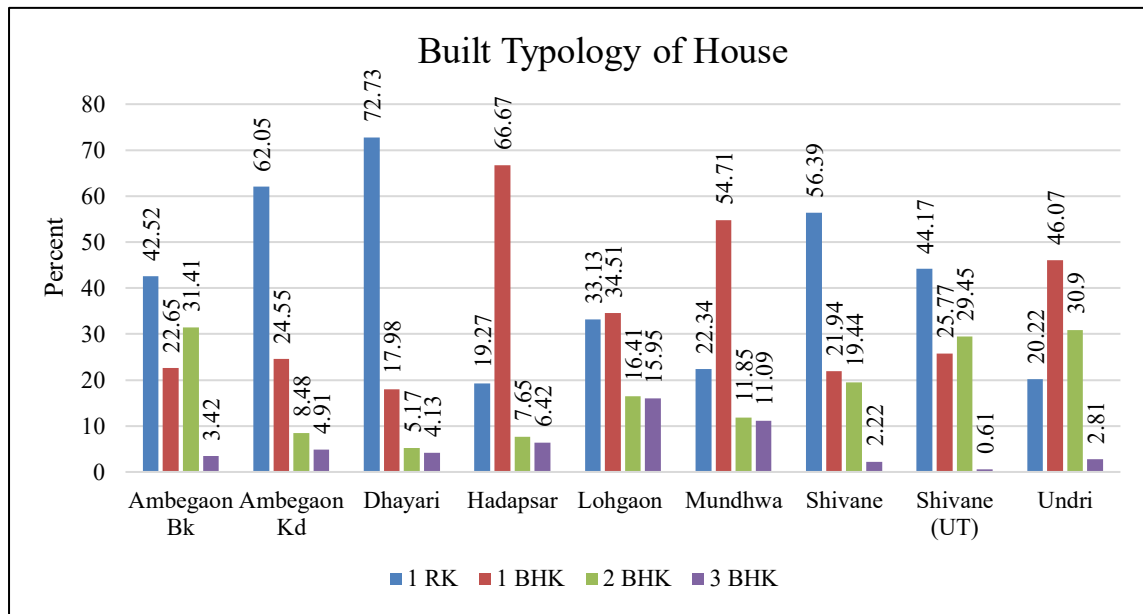


8.3 Characteristics of Present Housing

8.3.1 Housing Typology

In the nine villages, 1RK and 1BHK units dominate the housing typology, accounting for 41% and 35% respectively. The village-wise distribution of built housing typologies is presented in the following chart.

Figure 8.6 Built typology of houses

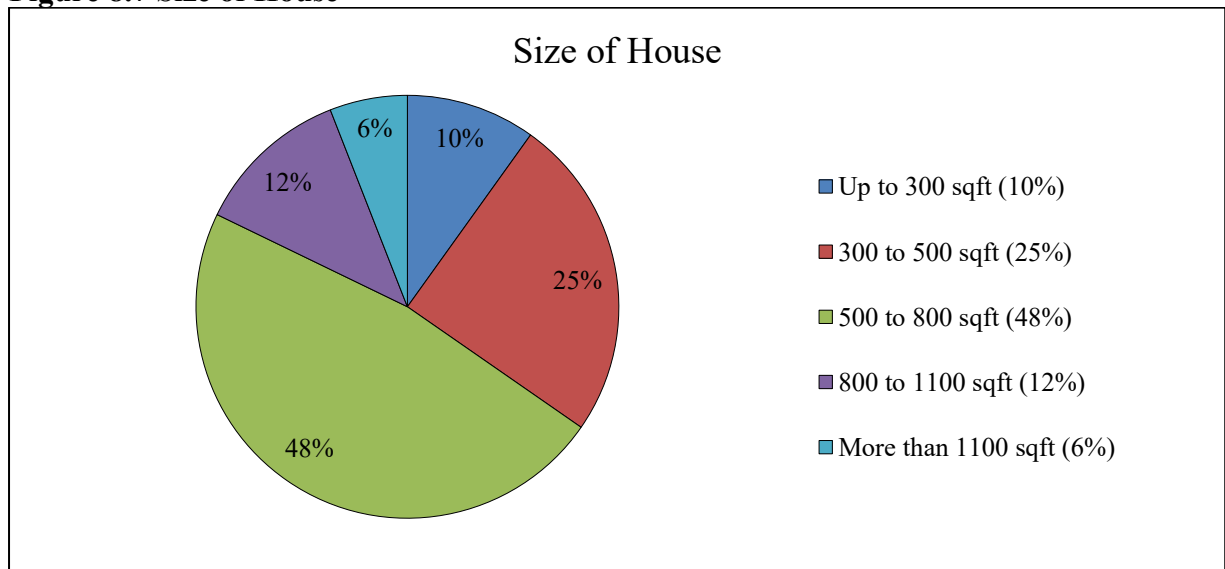


Within the developer-led housing typology, 1RK units dominate in villages where dense development has flourished, while 1BHK units form the predominant housing type in other areas.

8.3.2 Size of Houses

In the nine villages, houses sized between 500-800 sq.ft. dominate (48%), followed by those between 300-500 sq.ft. (25%), as shown in the chart below. Houses smaller than 300 sq.ft., those between 800-1100 sq.ft., and those above 1100 sq.ft. each account for around 27% of the total housing stock. The highest share of houses above 1100 sq.ft. is found in Lohgaon (16.41%) whereas the maximum proportion of houses below 300 sq.ft. is observed in Hadapsar.

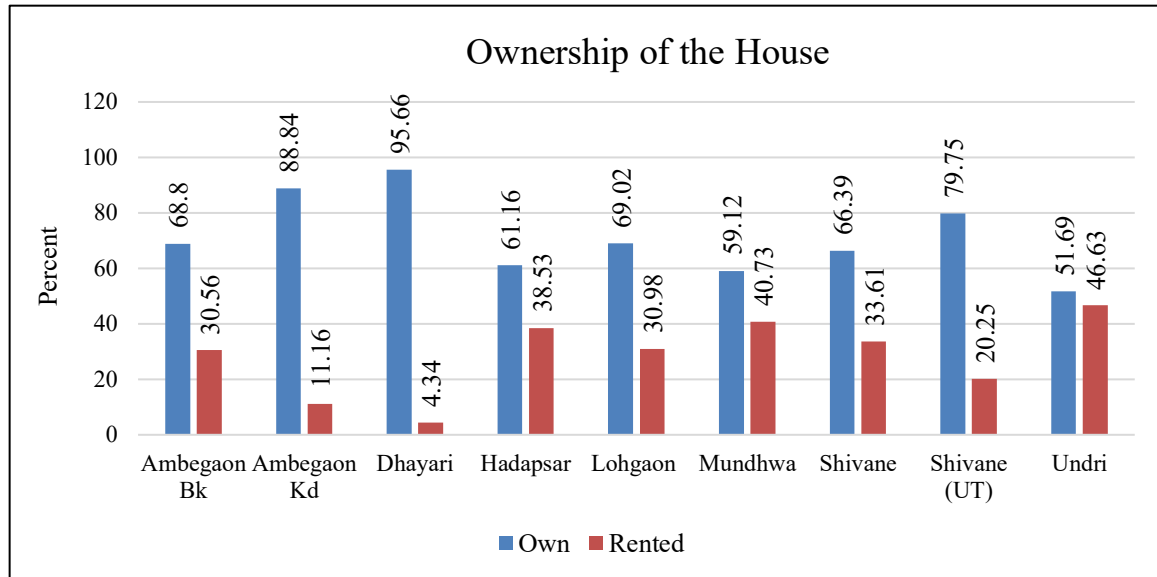
Figure 8.7 Size of House



8.3.3 Ownership Status of Housing

In the nine villages, almost 29% of houses are rented, and 71% are owned. Village Wise ownership status of houses are revealed in the following chart:

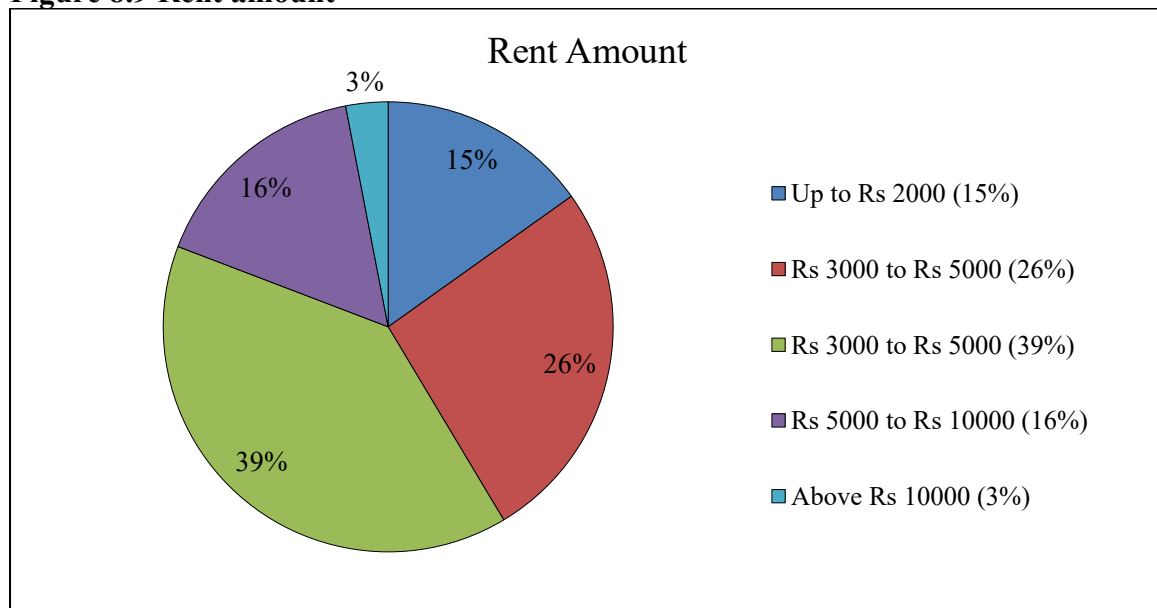
Figure 8.8 Ownership of housing in the planning area



8.3.4 Rental Housing Status

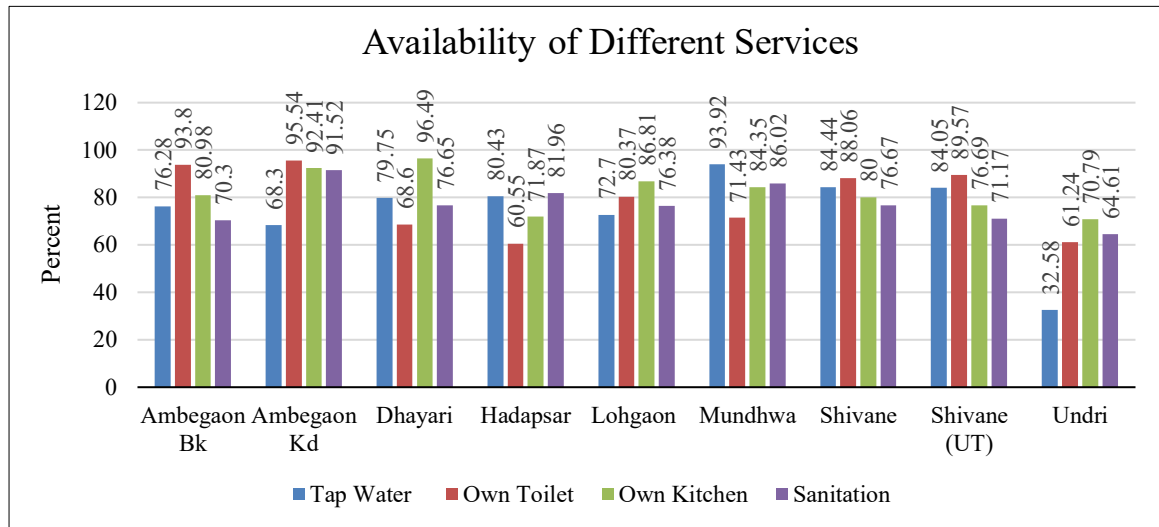
Nearly 30% of the total houses are under rental occupation. The rent amount and initial advance paid indicate the affordability of rental housing. When compared with the city area, rental housing in these villages appears relatively affordable and reasonable in terms of rent-to-income ratio. The initial advance, paid in the form of deposits, pagdi, brokerage, etc., generally ranges from ₹2,000 and, in some cases, exceeds ₹10,000.

Figure 8.9 Rent amount



8.3.5 Facilities and Services

Figure 8.10 Availability of tap water, sanitation, separate kitchen, separate toilet

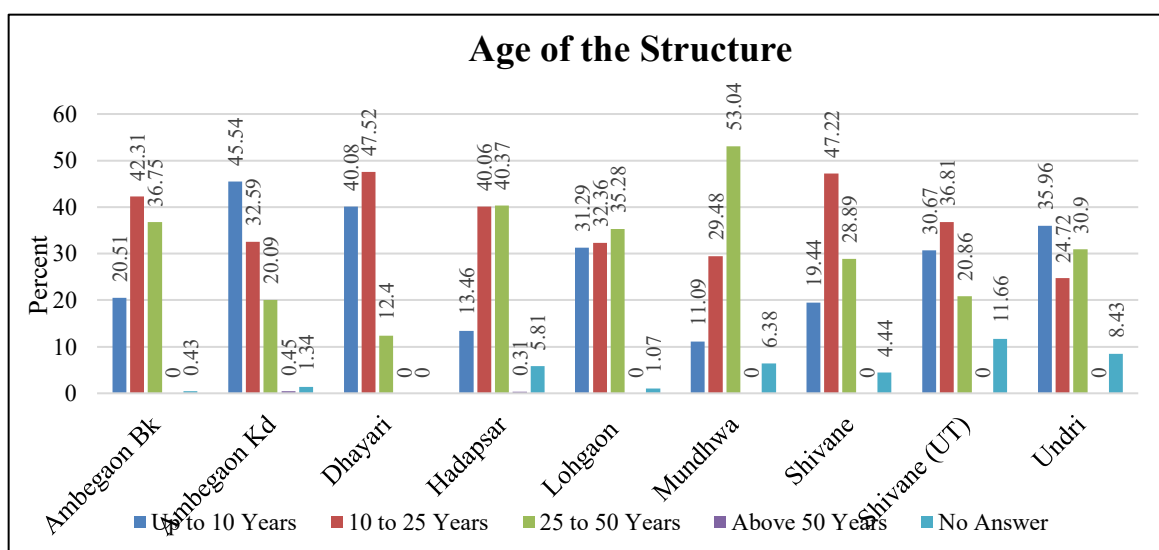


Due to urbanization most of the houses in nine villages already have services like tapped water, proper sanitation, electricity etc. Some village like Undri depend on water supply through tankers. Also congested areas in Undri and Hadapsar lack proper sanitation facilities.

8.3.6 Condition of Existing Houses

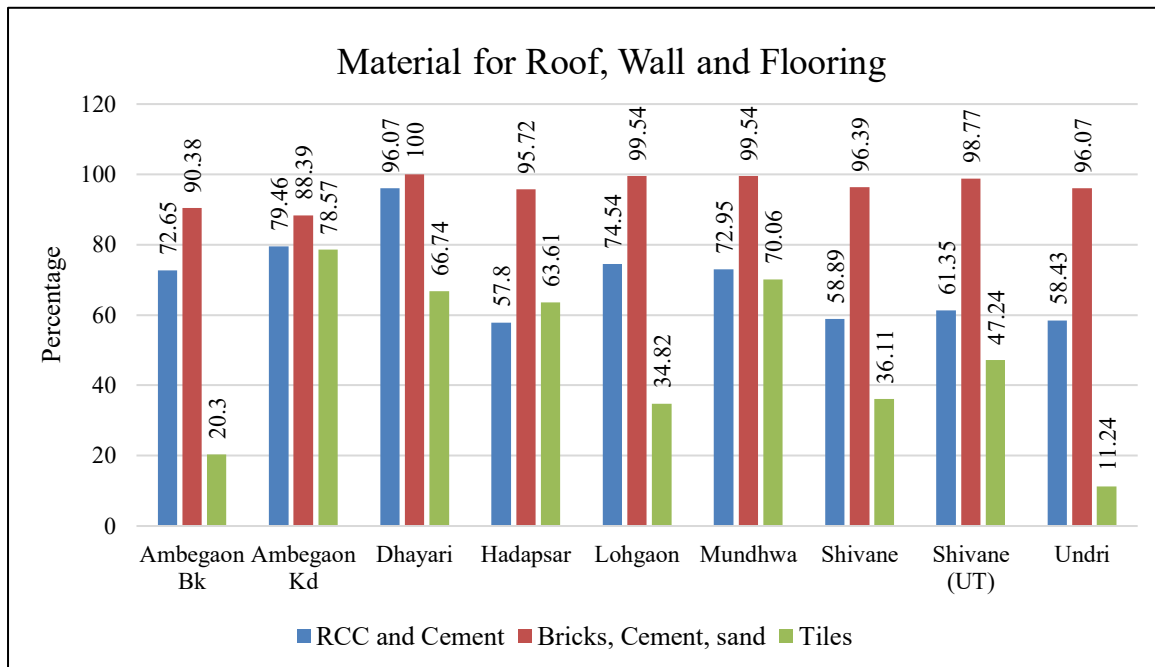
- i) **Age of structure:** The survey revealed that 37% of buildings in the nine villages are between 10 to 25 years old, while 31% of buildings are between 25 to 50 years old. Buildings that are less than 10 years old constitute 27.6% of the total. The village-wise distribution of building ages is illustrated in the following chart:

Figure 8.11 Village wise age of the structure



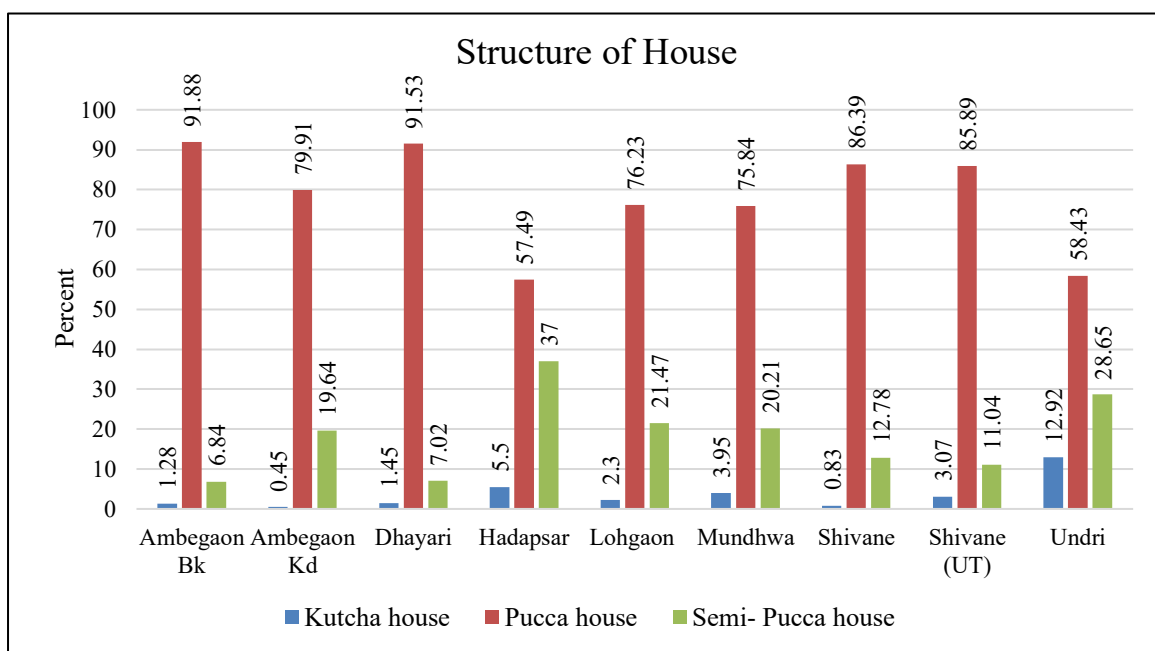
ii) **Material & Condition of Structure:** The materials used for constructing houses indicate the durability, lifespan, and overall condition of the structures. In the nine villages, most buildings feature RCC roofs, brick-mortar walls, and tiled flooring.

Figure 8.12 Material for roof/wall/floor



As defined in the Instruction Manual for Houselisting and Housing Census (Census of India 2011), housing structures are categorized as Kutchha or Pucca based on the materials used for roofs, walls, and flooring. The planning area predominantly consists of Pucca houses (77%), reflecting the large scale of urbanization, followed by 20% semi-pucca houses and 3% Kutchha (temporary) houses.

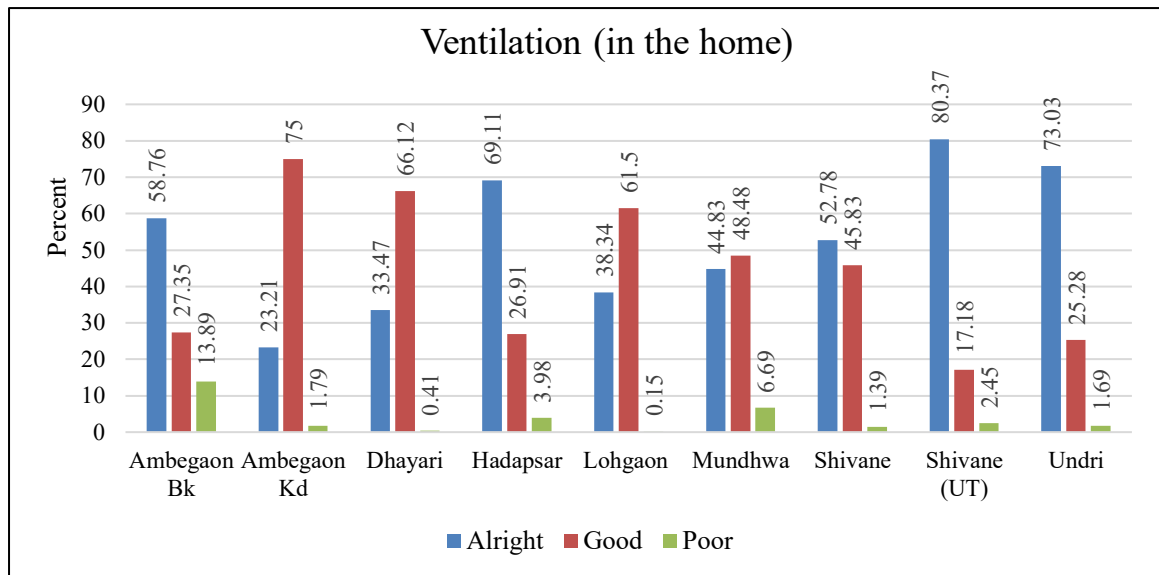
Figure 8.13 Village wise Structures of the Housing



8.3.7 Light and Ventilation

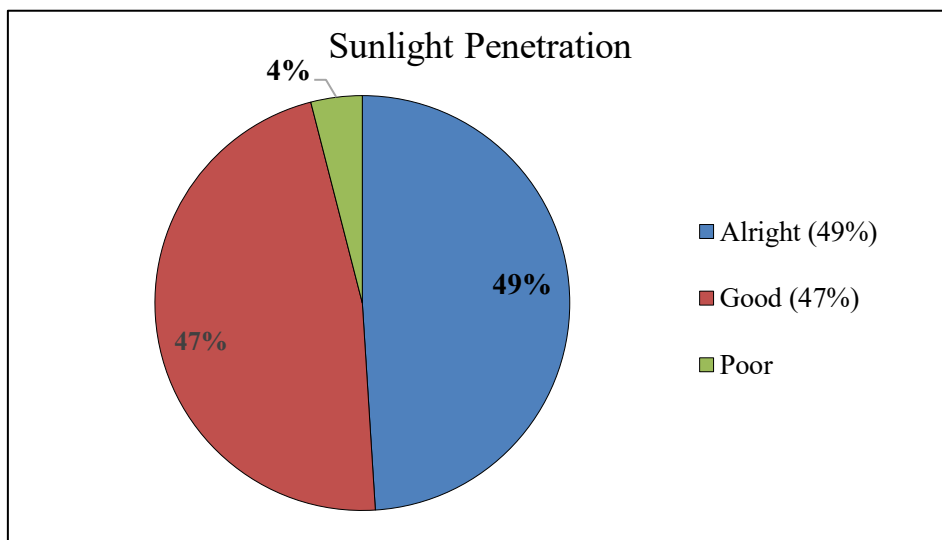
Natural light and ventilation are key indicators of healthy living conditions, as they significantly influence the quality of life of occupants. In the survey, 82% of respondents reported having up to two windows in their houses. The condition of ventilation in structures across the nine villages, as reported by residents, is illustrated in the following chart:

Figure 8.14 Village wise details of ventilation of houses, as rated by residents



Source: Household survey

Figure 8.15 Sunlight penetration in the houses in nine villages (in %)



Source: Household survey

About 5 % of the residents in nine villages registered low sunlight in their houses.14% respondents in Ambegaon Bk reported low sunlight in their houses.

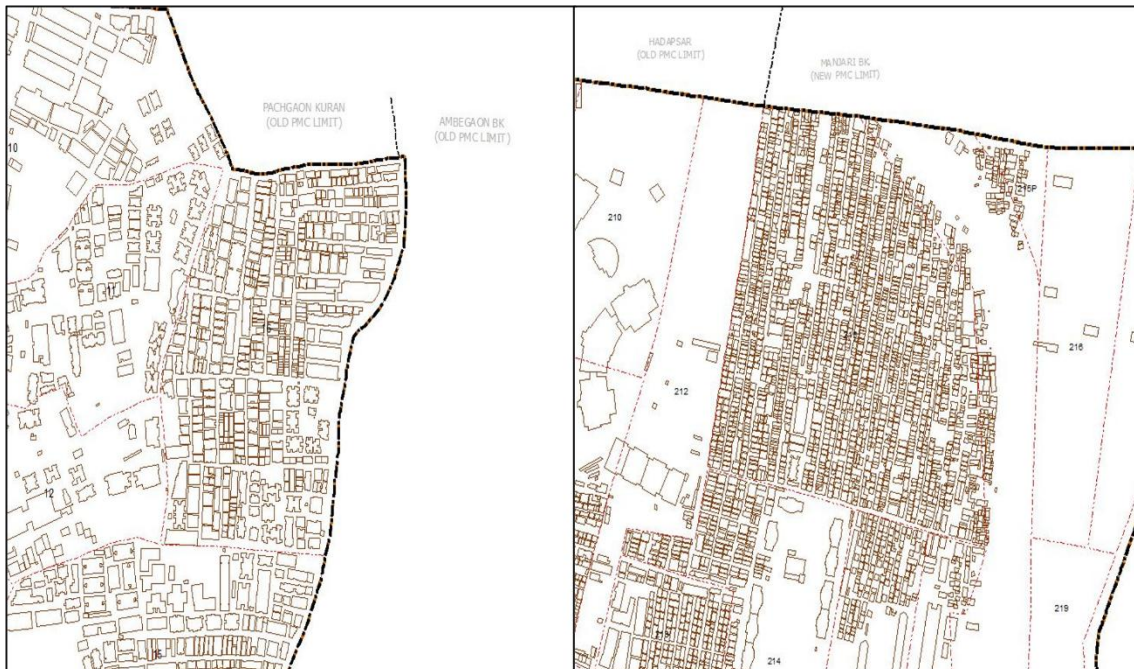
8.3.8 Fire and Structural Safety

Also from a fire safety point of view, accessibility of buildings, facilities in buildings like fire escape, refuge area, fire extinguishing equipment are important. As mentioned earlier, the majority of structures in densely populated and congested areas are built flouting building norms and regulations and lack any fire safety facilities. With very narrow lanes and by-lanes in the congested settlements accessibility of the structures from a fire safety and natural calamities point of view is the major concern. Most of the structures are constructed with substandard building materials. Hence Structural safety of these structures is also a main concern. In the planning area, Shani nagar in Ambegaon Kh, Moreshwar Colony, Lonkar nagar and Anand nagar in Mundhwa, Keshav Nagar, Sant Nagar & Sathe nagar in Lohgaon are densely populated. Some of them are identified as areas with fire and structural safety concerns and are given special attention while planning as evident in the following chapters.

Table 8.1 Densely populated and crammed development

Sr.No.	Village	Land Parcels- Densely Populated & having Crammed Development	
		Area (ha)	% w.r.t. village area
1	Ambegaon Budruk	13.29	5.37%
2	Fursungi	14.47	1.14 %
3	Shivane (Entire Uttam Nagar)	13.45	7.25% (of Developable area of Shivane)

Figure 8.16 Images of densely populated areas in nine villages



8.4 Analysis of Present Housing scenario

With the growing demand for residential housing in the city and its fringe areas, it is essential to assess the current situation of housing demand and supply. This assessment

provides a foundation for planning residential zones and determining the required amenities.

8.4.1 Existing Housing Stock with Its Capacity

According to the detailed ETS conducted in 2018 by M/s. IIC Technologies Ltd. in consortium with Monarch Surveyors and Engineering Consultants Pvt. Ltd. (the appointed agency), the total number of structures in the nine villages was approximately 40,108. These structures include residential, commercial, industrial, health, education, recreation, religious, and public utility/service facilities. The total number of residential structures was 30,497, comprising 1,36,515 tenements, as shown in the following table. The sample survey conducted in the nine villages indicated that 70% of occupants are homeowners.

Table 8.2 Village-wise details of residential structures in the nine villages in 2018

Sr no	Village	Number of Structures	Tenements	Ownership Houses (70%)	Rental Houses (30%)	Unoccupied houses
1	Ambegaon Budruk	2505	22584	14088	6037	2459
2	Ambegaon Khurd	3889	11848	6814	2920	2114
3	Dhayari	3166	15982	9487	4066	2429
4	Hadapsar	2186	12363	8207	3517	639
5	Lohgaon	9159	26658	16887	7237	2534
6	Mundhwa	3955	17532	7760	3325	6447
7	Shivane & Shivane (Entire Uttam Nagar)	3272	19107	9883	4236	4988
8	Undri	2365	10441	6096	2613	1732
	Total	30497	136515	79222	33951	23342

8.4.2 Demand and Supply of Housing

The demographic survey by Gokhale Institute of Politics and Economics; Pune, gives village wise projected population for year 2023, 2033 and 2043 and the household size. Number of tenements required to accommodate the population in the respective year is worked out on its basis. One can arrive at the shortfall of tenements by comparing the required number of tenements as per population and the actual number of tenements from a physical survey, as shown below:

Table 8.3 Population wise housing demand and supply in year 2023

Sr no	Village	Population	House hold Size	Required number of Tenements as per Population	Projected Supply of Tenements (considering urbanized area through Satellite Imagery in year 2023 and Tenement density of year 2018)	Shortfall/ Surplus Tenement (negative figures shoes Surplus tenements)
1	Ambegaon Budruk	71817	3	23939	22799	1140
2	Ambegaon Khurd	39809	3	13270	13283	-13
3	Dhayari	49624	2.3	21576	19168	2408

4	Hadapsar	113690	3.8	29915	14234	15681
5	Lohgaon	165546	4.6	35988	44445	-8457
6	Mundhwa	81709	3.9	20951	22566	-1615
7	Shivne & Shivane UT	58735	2.8	20977	22509	-1532
8	Undri	38516	2.9	13281	12204	1077
	Total	619446	3.4	179893	171208	8685

The data in Table 8.3 indicates that Lohgaon, Mundhwa, and Shivane villages in the planning area have a surplus housing stock, whereas Hadapsar and Dhayari face a significant shortfall of 52% and 11%, respectively, in the available (projected) tenements in 2023. This shortfall is expected to increase over time, as the population growth in the nine villages outpaces the rate of development in the real estate sector.

8.5 Future Housing Requirement

Gokhale Institute of Politics and Economics, Pune has presented population projections for years 2033 and 2043 keeping in mind the estimated tenure of 20 years of the proposed development plan in nine villages. The population projection gives a fair idea of the trend of future development and demand for Housing.

8.5.1 Demand

On the basis of projected population for the years 2018 (year of survey) and 2023 (period of planning process), the forecasted demand for housing for the year 2033 and 2043 is as shown in the following Table no. 8.4

Table 8.4 Village-wise demand of housing in year 2033 & 2043

Village	Housing Demand			
	For Year 2033		For Year 2043	
	Projected Population	Required Tenements	Projected Population	Required Tenements
Ambegaon Bk	78999	26333	86899	28966
Ambegaon Kh	47771	15924	57325	19108
Dhayari	74435	32363	104210	45309
Hadapsar	95136	25036	123676	32546
Lohgaon	248319	53982	347646	75575
Mundhwa	106222	27236	138088	35407
Shivane & Shivane (UT)	64608	23074	71069	25382
Undri	53923	18594	72796	25102
Total	769413	222542	1001709	287395

It can be seen that the tenement requirement in the first decade of planning duration is nearly 30 % considering the base year 2023, while the requirement seems to be stabilizing in the next decade (year 2033-2043) with 29 %.

8.5.2 Supply

To estimate the supply of housing for the years 2033 and 2043, the area designated as residential in the proposed land use of the Development Plan is assumed to be developed up to 80% within the first 10 years of the plan's tenure. A growth factor is applied to each village, taking into account its character, development trends, and the projected growth of the respective village. Potential FSI (Floor Space Index) utilization in the development of residential zones is considered to arrive at realistic housing supply projections. Additionally, the redevelopment of existing structures is factored in to enhance the supply of tenements, as elaborated in the following sections.

Table 8.5 Villagewise projected supply of housing in year 2033 & 2043

Village	Proposed Residential Area in Ha	Existing tenement Density (Ten/Ha) based on Surveyed structures & Urbanised Area	Growth Factor based on Village character & Developable area	FSI Consumption potential Factor (considering Housing for LIG, MIG, HIG and EWS)	For Year 2033		For Year 2043	
					Projected Supply of Tenements (assuming 80% of Residential area to developed by 2033)	Surplus/ Shortfall against Demand	Projected Supply of Tenements (assuming Remaining Residential area to Developed by 2043)	Surplus/ Shortfall against Demand
Ambegaon Bk	116.91	109	0.15	10.50	25439	894	26312	2654
Ambegaon Kd	44.10	247	0.29	10.50	24661	-8738	22972	-3864
Dhayari	278.41	81	0.34	10.50	57907	-25544	47027	-1718
Hadapsar	142.41	72	0.28	10.50	22596	2440	20961	11585
Lohgaon	1136.92	49	0.30	10.50	132416	-78434	108246	-32670
Mundhwa	244.74	100	0.34	10.50	62952	-35716	48576	-13169
Shivane & Shivane (UT)	71.78	172	0.15	10.50	24684	-1610	26121	-739
Undri	280.78	48	0.29	10.50	31171	-12577	24411	691
Total	2316.05				381826	-159285	324626	-37230

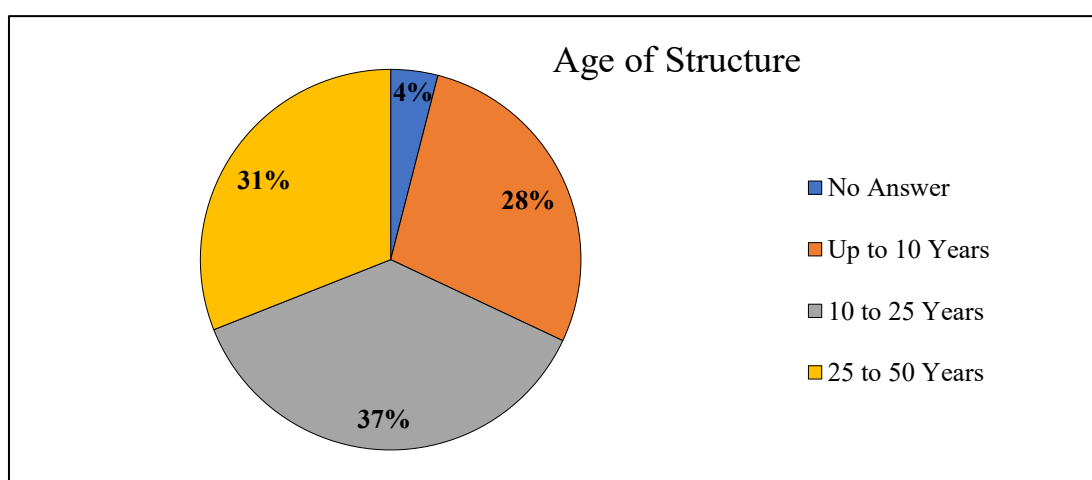
(Note- Positive sign is an indicator of Shortfall and Negative sign as Surplus amount in the Tenements.)

Table 8.5 shows that for the Year 2033 and 2043 there would be overall Surplus quantity of housing in the the planning area except Ambegaon Bk and Hadapsar- SadeSataraNali. The reason behind it is minimal residential areas are left for future development. There is a need to plan various housing schemes to cope up the housing requirements by 2043 specifically in Hadapsar- SadeSataraNali, Undri.

8.6 Number of Houses Expected to be Rebuilt / Redeveloped

In the fringe area, many residential buildings were constructed in the late 1980s to cater to the housing demand of migrants and residents from older city areas seeking more affordable options. At present, the age of these structures ranges from 25 to 50 years. Approximately 9,851 structures, which account for about 31 percent of the total residential buildings, fall within this category, as shown in the following graph.

Figure 8.17 Age of the structure at all the villages (in %)



Source: Household Survey

These structures are considered for reconstruction or redevelopment during the tenure of the proposed Development Plan, that is, over the next 20 years, as mentioned earlier.

Table 8.6 Structures to redevelop in year 2023, 2033, 2043: revise deleting 2018 & 2023

Sr no	Village	Existing Residential Structures in base year 2018	Percentages of Structures between Age 25-50 yrs (Sample Survey by Gokhale Institute) %	No of Structures to rebuilt in Planning Tenure	Structures to Rebuilt upto 2033	Structures to Rebuilt upto 2043
1	Ambegaon Budruk	2505	36.75	921	193	728
2	Ambegaon Khurd	3889	20.09	781	86	695

3	Dhayari	3166	12.40	393	29	364
5	Hadapsar	2186	40.37	882	206	676
6	Lohgaon	9159	35.28	3231	655	2576
7	Mundhwa	3955	53.04	2098	651	1447
8	Shivane & Shivane (UT)	3272	24.88	814	121	693
9	Undri	2365	30.90	731	131	600
	Total	30497		9851	2072	7779

8.7 Tenement and Population Density in Development Plan period (2023-2043)

The Development Control Regulation (DCR) 2017 for Pune city recommended a tenement density of 250 tenements per hectare in urban areas. However, the UDCPR 2020 does not specify any criteria for tenement density, as it has significantly raised the limit of allowable FSI in urban areas. In addition, provisions such as Ancillary FSI, Premium FSI, TOD zones, additional FSI for specific purposes (such as government quarters, MHADA housing, redevelopment of existing or dilapidated buildings, and EWS/LIG housing), incentive FSI for green buildings, and TDR have enabled much higher tenement densities than those recommended earlier. The URDPFI guidelines recommend 125–175 persons per hectare (PPH) in metropolitan cities, which translates to around 30–42 tenements per hectare (considering a household size of 4.2 as per Census 2011). This standard is grossly inadequate in the current context of rapid urban growth. Against this backdrop, a comparative study of village-wise projected population density and tenement density, along with the recommended standards for available residential land, is presented below.

Table 8.7 Proposed future tenement density and population density for the years 2033 and 2043 (based on proposed residential zones)

Sr. No.	Village	Proposed Residential Area in Ha	For Year 2033		For year 2043	
			Projected Tenement density (Ten/Ha) (considering 80% Residential area would be developed with respective FSI component 2.5)	Projected Population Density PPH	Projected Tenement density (Ten/Ha) (considering Proposed Residential to be developed fully with respective FSI component 2.5)	Projected Population Density PPH
1	Ambegaon Bk	116.91	109	338	90	297
2	Ambegaon Kh	44.10	280	542	208	520
3	Dhayari	278.41	104	134	68	150
5	Hadapsar	142.41	79	334	59	347
6	Lohgaon	1136.92	13	25	38	278
7	Mundhwa	244.74	129	217	79	226
8	Shivane & Shivane-UT	71.78	391	1023	146	900
9	Undri	280.78	56	96	35	104
	Average		145	339	90	353

The average projected tenement density for the nine villages over the 20-year tenure of the Development Plan is 90 tenements per hectare, which is nearly double the norms recommended by the URDPFI guidelines. Similarly, the average projected population density for these villages is 353 persons per hectare, exceeding the URDPFI range. An exception is observed in Shivane and Shivane-Uttamnagar, which have a projected tenement density of 146 tenements per hectare and a population density of 900 persons per hectare, respectively.

8.8 Projected FSI consumption and Tenements requirement in Development Plan period (2023-2043)

The total developable area within the newly added nine villages amounts to 4171.202 Ha. Based on this developable land, the projected residential growth has been assessed across different housing categories, namely High-Income Group (HIG), Medium Income Group (MIG), Low Income Group (LIG), and Economically Weaker Sections (EWS). The projections are derived through a detailed analysis of existing demand, prevailing development practices, and emerging growth trends. The estimated figures for Floor Space Index (FSI) utilization and the number of tenements are presented in the following tables:

Table 8.8 Projected FSI consumption and tenements in 2043

Village	for HIG with FSI- 2		for MIG with FSI- 2.5		for LIG with FSI - 3		for EWS with FSI - 3		Surplus Tenements compared to Projected Tenements in 2024
	Area (Ha)	Tenements	for MIG with FSI-2.5 Area n Ha	Tenements	for LIG with FSI -3 Area n Ha	Tenements	for EWS with FSI-3 Area n Ha	Tenements	
Ambegaon Budruk	35.07	11691	116.91	38970	105.22	35073	52.61	17537	74304
Ambegaon Khurd	13.23	4410	44.10	14700	39.69	13230	19.85	6615	19847
Dhayari	55.68	24210	348.01	151310	250.57	108943	83.52	36314	275468
Hadapsar	28.48	7495	178.01	46845	128.17	33729	42.72	11243	66766
Lohgaon	227.38	49143	1421.15	308946	1023.23	222441	341.08	74147	579390
Mundhwa	48.95	12551	305.93	78442	220.27	56478	73.42	18826	130891
Shivane & Shivane (Entire Uttam Nagar)	14.36	5127	89.73	32045	64.60	23072	21.53	7691	42553
Undri	112.31	38728	280.78	96821	252.70	87139	84.23	29046	226632
Total	535.46	153,335	2,784.8	689,039	2,084.45	647,075	688.96	200,409	1,415,151

Shivane & Shivane (Entire Shivane Uttam Nagar) show minimum potential for development whereas Dhayari and Undri show the maximum potential. Although Lohgaon shows more area as Developable area but due to the Air- force restriction, the potential for the development is comparatively low.

8.9 Housing Policies

Despite a significant increase in housing stock in India in recent years, affordable housing has not adequately reached the needy, as reflected by the high vacancy rates in urban areas.

Policies related to affordable housing in India have primarily been guided by theoretical frameworks such as Olsen’s *Filtering Theory*, John Turner’s *Self-Help Housing Model* (first introduced in India by Christopher Benninger in Baroda and Chennai), Keare and Parris’s *Houses as a Bundle of Services* model, and John Rawls’s *Theory of Justice*. These policies have largely emphasized the supply side of housing, focusing on construction and provision. In contrast, the demand side requires a dynamic database of housing-related information, encompassing stakeholders such as buyers, sellers, producers, prices, and current market bids, to ensure that housing reaches the intended beneficiaries.

The legislative and policy framework for housing in India has evolved over time. The British Government enacted the Housing Act in 1850, providing an early legal framework. Post-independence, the Constitution of India (1951) laid the foundation for housing policies. Subsequently, successive Five-Year Plans included specific housing strategies to address both urban and rural needs. Major central-level housing schemes and policies include the Indira Aawas Yojana (IAY, 1985), National Housing Policy (NHP, 1988; revised 1998), Urban Basic Services for the Poor (UBSP, 1990), National Urban Housing and Habitat Policy (NUHHP, 2007), Rajeev Aawas Yojana (RAY, 2011), Pradhan Mantri Aawas Yojana–Urban (PMAY-U, 2014), and the Draft National Rental Housing Policy (2015). These initiatives reflect the government’s ongoing efforts to address the housing needs of India’s growing population. The following table gives summary of policies related to housing in India.

Table 8.9 Summary of policies related to housing in India

Government	Policies related to Housing in India	Year
Central	Constitution of India	1951
	Five Year Plans	1951- 2017
	(Draft) National Housing Policy - NHP	1988
	National Housing Policy - NHP	1998
	National Urban Housing and Habitat -NUHHP	2007
	Rajiv Aawas Yojana – RAY	2013
	Pradhan Mantri Aawas Yojana (Urban)– PMAY (U)	2015
Central and State	Supporting Legislation and Government Policies for Housing	Updated
State of Maharashtra	State Housing Policy	2007
	Model State Affordable Housing Policy for Urban Areas MSAHP	2015
	(Maharashtra) State New Housing Policy and Action Plan – MSN HPAP	2015
	Unified Development Control Regulations - UDCPR	2020
Local	Development Plans	Updated
	City specific Development Control Regulations (In addition to UDCPR)	Updated

Source: Information collected from various reports and published articles by Gokhale Institute

Noteworthy efforts regarding housing policies at the state level were materialized in the form of the State Housing Policy, 2007. The Government of Maharashtra launched the *Inclusive Housing Policy* in 2012, based on the Rajiv Aawas Yojana (RAY), followed by the *Model State Affordable Housing Policy for Urban Areas* (MSAHP) in 2015. The State

New Housing Policy and Action Plan (MSNHPAP) was launched immediately after MSAHP, focusing on housing concerns related to the City and Region of Mumbai. The UDCPR 2020 includes a policy mandating a 20% provision of affordable housing for plots larger than 4,000 sq. m., which was a prerequisite under JnNURM.

8.10 Affordable Housing

Policies related to affordable housing in India are summarized in the table below

Table 8.10 Summary of policies related to affordable housing in India

Sr. No	Housing Theory Approach	Approaches' Example	Name of the Housing Policy in India
1	Housing Filtering (Olsen, September 1969)	Increase Supply Supply-Side Subsidies Incentives to developer	Five Year Plans Special Township Policy (2002 – till date) Foreign Direct Investment -FDI in Real Estate PMAY (U): Affordable Housing Project -AHP
2	Self-help Housing	Site and Services Schemes Urban Community Development Projects	Site and Services Pradhan Mantri Awas Yojana (Urban) - PMAY (U): Beneficiary Led Individual House Construction
3	Housing as a Bundle of Services (Keare and Parris, 1982)	Slum (Environment) Improvement Schemes Basic Services to Urban Poor- BSUP (under Jawaharlal Nehru National Urban Renewal Mission - JnNURM and Rajiv Awas Yojana-RAY, Slum Free City Plan of Action -SFCPoA)	Urban Basic Services for the Poor– UBSP, 1990 Basic Services to Urban Poor- BSUP Addressing concerns of Sanitation under Swachh Bharat Abhiyan (Clean India Movement)
4	Justice Approach Subsidy	Demand Side Subsidy to Beneficiary Income Tax Benefits for Housing Finance	Credit Link Subsidy Urban Land Ceiling Act (and Control Regulation) Act - ULCRA Income Tax Act 1961: Section 35D and Section 80 (amendments in the year 1987)
5	Justice Approach Cross Subsidy	Twenty per cent provision of Affordable Housing' for plots more than 200 Sq. M. Slum Rehabilitation Authority - S.R.A. Project Provision for 20 per cent of the residential development' land subdivision of admeasuring 2,000 Sq. M. and layout of the land measuring 2,000 Sq. M.'	Inclusive Housing Policy by State Government of Maharashtra, Andhra Pradesh, Madhya Pradesh, etc. (Series of) Slum Acts, (mainly Slum Act, 1971)
6	Justice Approach Direct	Social Housing Schemes Slum clearance and Relocation Free Resources sharing such as land, housing units, etc. Slum Relocation	Maharashtra Housing and Area Development Authority - MHADA Housing Tenure Security schemes such as Patta Scheme in the State of Odisha

Source: Information collected from various reports and published articles by Gokhale Institute

8.11 Public Housing in Nine Villages

Public housing in the nine villages is currently almost non-existent, while in the old PMC limits, the minimal presence of public housing highlights a significant vacancy of affordable housing in the city. At present, very few housing schemes in the nine villages, recently developed by private developers, include a share of affordable housing as mandated by UDCPR 2020.

As mentioned earlier, for new developments in the nine villages under the current development plan, the share of Low Income Group (LIG) housing and housing for the Economically Weaker Section (EWS) is set at 30% and 10% respectively, with a projected demand of 1,21,403 tenements for LIG and 40,468 tenements for EWS by the year 2043. Effective implementation of government housing policies will be crucial in meeting these affordable housing requirements.

In this context, apart from privately developed affordable housing on private lands as per UDCPR 2020, schemes such as the Maharashtra Housing Area and Development Authority (MHADA) and the Pradhan Mantri Aawas Yojana (PMAY) are promising initiatives. Additionally, the provisions of the Development Plan for the nine villages will play an important role in addressing the city's affordable housing needs.

8.11.1 UDCPR 2020

The provisions for EWS/LIG housing in UDCPR 2020 are primarily outlined in two ways: (i) as part of development on private land designated for EWS/LIG (Clause 3.8 – *Inclusive Housing*), and (ii) for the development of EWS/LIG housing on entire private plots. These provisions are discussed in the following paragraphs.

A) Development of Housing for EWS/LIG as per UDCPR 2020:

Clause 7.7 provides for the development of housing for EWS/LIG on privately owned lands, offering certain benefits in terms of Floor Space Index (FSI).

- a) In Residential Zone:** The maximum building potential of the land can be utilized if the owner constructs housing for EWS/LIG in the form of tenements with a built-up area of up to 50 sq. m., subject to the following conditions:
- i) The premium FSI shall be charged at the rate of 15 % of Land rate in ASR
 - ii) At least 40% tenements shall be with 30 sq. m. or less built up area.
 - iii) Only one tenement to be sold to a single family
 - iv) Marginal distances (except front margin), parking and other requirements as per Slum Redevelopment Regulations
 - v) Owner can avail TDR instead of Premium FSI as mentioned in (i)

b) In Agricultural Zone:

Development of housing for EWS/LIG is allowed to be developed in agricultural zones with one FSI and with an approach road of minimum 9.0 m and responsibility of development of infrastructure shall lie with the owner/ developer.

B) Inclusive Housing:

UDCPR 2020 Clause no 3.8.2 provided details of inclusive housing under this scheme as under.

a) For subdivision or layout of the land admeasuring net 4000 sq m. for residential purpose, minimum 20% of the net plot area shall have to be provided either –

i) In form of Developed plots of 30-50 sq m for EWS/LIG (Affordable Plots) for MHADA allottees

Or

ii) In form of plot/plots equivalent to 20% of plot area to be handed over to MHADA for constructing EWS/LIG

Or

iii) The land owner / Developer can construct EWS/LIG tenements on the same 20% plot area or on an equivalent plot within 1 km from original location or within the ward, as per norms for EWS/LIG tenements in Group housing scheme

Or

Land Owner / Developer can hand over the affordable plots at one place to MHADA in lieu of FSI to be utilized on remaining plots / TDR

b) For Group Housing Scheme land admeasuring net 4000 sq m. for residential purpose, EWS/ LIG Housing (or Affordable housing) under the Housing Scheme (consisting of one or more buildings) in the form of tenements of size/built-up area ranging between 30 and 50 sq.m. shall be constructed at least to the extent of 20% of the basic FSI subject to the following conditions.

i) The built-up area of the EWS/ LIG tenements constructed under the Scheme shall be over and above the permissible FSI/ TDR

ii) The Authority shall ensure the Occupation Certificate for the rest of the development under the said scheme after only the occupation certificate is issued for the Affordable Housing tenements under the scheme in the same plot to the Landowner/ Developer

iii) The Owner / Developer, after getting commencement certificate of Affordable Housing component as mentioned above shall immediately intimate to MHADA regarding the numbers of tenement to be disposed by them to the allottees.

iv)The Landowner/ Developer may also be permitted to utilise 1/4th of the total 20% FSI earmarked for Affordable Housing towards construction of Affordable Housing Tenements in the form of service quarters in the same or separate building.

v)Amalgamation of affordable plots/ affordable tenements shall not be allowed.

8.11.2 MHADA

MHADA is the state-level agency (except in the Vidarbha Region) responsible for constructing public housing in Maharashtra for people belonging to the lower strata of society. To date, MHADA has provided affordable housing to nearly 7.5 lakh families across the state, with approximately one-third of these located in Mumbai. Each year, the respective regional boards of MHADA conduct a housing lottery to allot new homes at affordable prices. Although currently absent in the nine villages, MHADA could play a significant role in providing affordable housing in these areas in the future.

8.11.3 Pradhan Mantri Aawas Yojana (PMAY)

Launched with the vision of providing every family a pucca house equipped with a water connection, toilet facilities, 24×7 electricity supply, and access by the time the nation completes 75 years of independence, the *Pradhan Mantri Awas Yojana (Urban) – Housing for All* mission aims to address the housing shortage for the urban poor in 51 cities and towns across Maharashtra during 2015-2022. Central assistance is provided to implementing agencies through the States and Union Territories for execution of the program.

The Central Sanctioning and Monitoring Committee (CSMC) serves as the final authority for sanctioning proposals under PMAY-U. The State Level Sanctioning and Monitoring Committee (SLSMC) is constituted as per central guidelines. A State Mission Directorate is established to scrutinize proposals, submit them for approval to the SLSMC through the State Level Nodal Agency (SLNA), manage grants received, distribute funds to civic bodies, monitor scheme progress, oversee implementation, and guide city-level technical departments.

At the city level, a Technical Cell is formed to prepare the Action Plan for *Housing for All*, implement the Annual Implementation Plan, and appoint experts either on a contract or deputation basis. Beneficiaries are categorized based on household income into four groups:

- **Economically Weaker Section (EWS):** HH income up to ₹3 lakh per annum
- **Lower Income Group (LIG):** HH income ₹3-6 lakh per annum
- **Middle Income Group I (MIG I):** HH income ₹6-12 lakh per annum
- **Middle Income Group II (MIG II):** HH income ₹12-18 lakh per annum

Every family is assisted through the four verticals of the scheme/program. A summary of PMAY-U *Housing for All* components is provided below.

Table 8.11 Summary of Pradhan Mantri Awas Yojana - PMAY

Description	In Situ Slum Redevelopment: ISSR	Affordable Housing through Credit Link Subsidy: CLSS	Affordable Housing in Partnership: AHP (on Gov land) / AHP-PPP (on Gov/ private land)	Beneficiary led Individual House Construction: BL
About the Vertical	Using land as a resource	Being a demand side intervention, Interest subvention subsidy for new / repurchase house	A Supply-side intervention. On PPP basis in which 35 % shall be EWS	For EWS beneficiary for new house or enhancement on their own
Incentives	To make projects feasible financially Extra FSI or TDR is given OR GoI grant Rs. 1 lakh per house	Upfront interest subsidy at the rate of 6.5%, 4% and 3% respectively on housing loans of Rs.6 Lakh for EWS/LIG, Rs.9 Lakh for MIG-1 and Rs.12 Lakh for MIG-II for a tenure of 20 years	Financial support of Rs 1.5 lakh and 1lakh by Center and State respectively per beneficiary for a scheme up to max. 250 DUs, along with UTs assistance if any	Financial support of Rs 1.5 lakh per beneficiary.
Process and or Scope	With private participation	The carpet area of houses should be upto 30 sq mt, 60 sq mt,160 sq mt and 200 sq mt for EWS, LIG, MIG-I & MIG-II respectively. As per Census 2011, all 4041 legislative urban agglomerations covered.	Tender notice for invitations of proposals is made.	more workable where a small piece of residential land is available with EWS /LIG citizens. Cities to prepare a separate integrated project for such beneficiaries.
Critical Appraisal	The SFCPoA, RAY, logically states its action plan, which should have been adopted.	CLSS should be decentralized, appropriate amendments in the IT Act, CNN portal to comply with the constitution's 74th CAA, list of beneficiaries and applications be made public for transparency.	Not gone beyond floating tender for the identification of beneficiaries.	Not gone beyond detailed project reports for such proposals, due to the requirement of many kinds of documents.
On occasion, the benefit of any component will be allowed.				

Source: Information collected from various reports and published articles by Gokhale Institute

8.11.3.1 Implementation of PMAY mission in Pune City limits by Pune Municipal Corporation

Pune Municipal Corporation has formed a special dedicated cell as well as an independent officer for implementing the campaign effectively.

For the District Pune, Targeted tenements under PMAY Project are 1, 25,000 till 2022.

Even though the government and allied bodies are major landholders their ability to develop land and supply affordable housing stock is limited due to limited capital available with ULBs and other such organizations. Therefore, considering this aspect PMC has adopted the Model of *Direct Relationship Ownership Housing (DROH)* to make available the housing stock under this model of PMAY. As per model norms PMC will provide land at nominal rates on long term lease and private developers will develop land for housings.

The Pune Municipal Corporation has passed a resolution to provide lands under HDH/ EWS reservation at three locations Hadapsar, Kharadi and Wadgaon, for construction of Housing projects at zero cost, as the Component of *Affordable Housing in partnership (AHP) on Govt Land by Govt agencies/ Implementation agency*, through PMAY (U). This has reduced the cost of tenements by nearly 4 to 5 lakhs.

Currently five projects are being executed under the Scheme under at above tree locations. Details of cost and no of flats are mentioned in the table below.

Table 8.12 Details of AHP projects of PMC on Govt. lands

Sr. No.	Project Name	Sale Price per Flat	Total no. of flats
1	Survey no 106A/16/ 17A Hadapsar	10,94,085	340
2	Survey no 89 (P) + Survey no 92 (P) Hadapsar	10,50,400	584
3	Survey no 57/5 (P) Plot No-1 Kharadi	10,91,203	786
4	Survey no 39 (P) + Survey no 40 (P), Wadgaon Khurd	12,17,095	1108
5	Survey no 106A/12B/3B (P) Hadapsar	11,20,564	100
Total			2918

Housing projects mentioned in the Table 8.15 are completed in spite of that total 1030 tenements are still vacant after the first online lottery which was drawn during the period of Pandemic (Covid-19) in 2020. The verification of documents is in process after the Second online lottery was drawn recently.

Total 3,402 tenements under provision of Accommodation Reservation Proposed for PMAY are submitted to the Govt. for approval. At the next stage of PMAY project, PMC is planning projects at Baner, Balewadi, Dhanori, Mohmadwadi and Kondhwa with 2607 tenements. Amongst the included nine villages Lohgaon and Fursungi having Government

land (Gairan) is taken by the PMC for the PMAY project for remaining tenements of approximately 12,120.

Table 8.13 AHP projects of PMC on Govt lands through Private Partnership

Sr. No.	Details of Land			Type of housing	No. of Tenements
	Village	Address	Area in Sq m		
1	Balewadi	S.No. 44 + 45	2599	EWS	296
2	Balewadi	S.No. 49 + 50	3618	EWS	251
3	Baner	S.No. 12	8745	EWS	414
				LIG	234
4	Kondhwa	S.No. 43 + 44	15333	EWS	624
				LIG	112
5	Dhanori	So. No. 7/1 + 7/2	8924	EWS	676
	Total				2607 Tenements
Proposed Tenements under the scheme of 'Housing for All -PMAY' in nine village					
6	Lohgaon	Sr no. 35	32700	EWS	2120
	Total				2120 Tenements

Under the model of *Affordable Housing in partnership (AHP) on Private Lands through AHP-PPP*, Pune Municipal Corporation made an appeal to private developers in order to participate in the scheme. The developer gets 2.5 basic FSI for construction. In total 6,000 tenements are expected through 8 various projects situated at Hadapsar, Lohgaon, Kondhawa and Dhanori. Out of which the project under progress is listed below in the table no 8.14

Table 8.14 AHP projects of PMC on private lands under PPP

Sr. No.	Details of Land		Type of housing	No. of Tenements	Present Status
	Village	Address			
1	Lohgaon	Survey no. 298/2D / 2	EWS	499	RCC work of all floors of 6 buildings has been completed. And brickwork and plaster work of 6 buildings has been completed. 100% Booking is Completed.
			LIG	76	
2.	Mohammadwadi, Hadapsar	Survey no (76d) part no. 5A, 5B, 6, 7	EWS	276	RCC work of 10 storey of all buildings has been completed. Booking is in Process

3	Dhanori	Survey no. 7/2/1	EWS	109	Footing of all buildings has been completed. 100% Booking is Completed
4	Kondhwa	Survey no 40/2	EWS	200	Excavation work has started
5	Kondhwa	Survey no 44/1/2A/1/2/3	EWS	477	CSMC approved project. Booking is in Process
Total			EWS	1561	1637 Tenements
			LIG	76	

Thus the total Tenements within the city limit would be available in the near future through the various schemes /programs and by different agencies are tabulated as follows:

Table 8.15 Total housing stock in PMC limits through PMAY (U)

Type of Scheme / Component of PMAY (U)	Implementing Agency	No. of Tenements from completed projects
In-Situ Slum Redevelopment	Slum Rehabilitation Authority	—
Affordable housing Through Credit linked Subsidy (CLSS)	Primary Lending Institute (ie. Banks, HFCs, non-banking finance Institute etc.)	92,949
Affordable housing in Partnership (AHP)	PMC (On Government Land)	2,918
	PMC (On Private Land)	1561
	Projects under PPP	2607
Subsidy for Beneficiary- led Individual house Construction/ Enhancement	—	—
Total Housing Stock in PMC limit through PMAY		1,00,035

As the new nine villages show a major share of the migrant population, housing for such population is also necessary to consider.

8.11.3.2 Affordable Rental Housing Complexes (ARHC)

The Government of India aims to promote economic activities through the vision of “Atma Nirbhar Bharat”. In line with the vision of Self-reliant India, Ministry of Housing and Urban Affairs (MoHUA) after consultation with concerned Central Ministries/Departments, States/UTs and other stakeholders from Private/ Public Sector has launched Affordable Rental Housing Complexes (ARHCs) scheme for urban migrants/ poor as a sub-scheme under PMAY (U). ARHCs aim at creating vibrant, sustainable and inclusive affordable rental housing with all civic amenities in proximity to their workplace by:

- Utilizing existing Government funded vacant houses in cities by converting them into ARHCs under Public Private Partnership (PPP) mode or by public agencies as a Centrally Sponsored Scheme,
 - Construction, Operation and Maintenance of Affordable Rental Housing Complexes by Public/ Private Entities on their own vacant land as a Central Sector Scheme.
- i) The dense subdivision is a concern as it affects the health of the end user. Such development needs to be prevented and cured with the planned 'urban design' approaches such as 'Diagnostic Cure' and 'Conservative Urban Surgery'.
 - ii) PMC needs to monitor and control haphazard development, considering safety, disaster management and occupant hazard mitigation. Such majors could include coordinating with the Stamp Duty and Registration, effectively exercising legal provisions under the Maharashtra Municipal Corporation Act; 1949 and MR&TP Act; 1966. PMC should use advanced technology such as 'Satellite Vigilance' and 'GIS integration' along with social and political will for society wellbeing and to create healthy cities.
 - iii) Vision of slum free city can be achieved through implementation of Rajiv AwasYojana scheme, policies for Slum rehabilitation/Redevelopment schemes and PMAY for affordable housing through SRA rules and D.C. regulations.
 - iv) Policies for providing Rental Housing need to be introduced taking into consideration the demand for the same.
 - v) Cluster development for dilapidated wadas/chawls in the old parts of the city needs to be introduced.
 - vi) Policies for promotion of Integrated development of townships, densification along MRTS corridors needs to be introduced.

8.12 Conclusion

The housing demand in Pune is growing like any other city in India. If the housing concerns are not understood appropriately and adequately, the scenario is visible in the form of slums. The area under development or the developed area in the nine villages is mostly unplanned, with insufficient or no side margins, development on plots on 1000 sq. ft. plots (congested development) resulting in low environmental quality. PMC is responsible for providing physical infrastructure in these villages. It also means planning of physical infrastructure needed in tune with the demographic and current development trends.

While planning various aspects that need consideration, are

- Sizable share of houses which are 25 to 50 years old.
- Only 62 % are happy with the drainage system while only 67% reported having a water supply from the government source with the majority of the residents getting daily water supply for up to 30 minutes only.
- Almost every second person needs to travel at least one kilometer to get public transport.

CHAPTER 9 : TRAFFIC AND TRANSPORTATION

Introduction

A robust Traffic and Transportation (T&T) system forms the backbone of urban and regional development. Effective T&T planning aims to promote sustainable transport with objectives such as enhancing transport system diversity, supporting smart-growth land-use development, conserving energy, reducing emissions, and implementing efficient transport pricing.

Strategic transport planning relies on comprehensive data regarding the current scenario, future requirements, development prospects, and available resources. It also considers demographic and socio-economic travel characteristics, environmental and topographical factors, accessibility across different areas, and connectivity with other parts of the state and country. To create a holistic database from a planning perspective, detailed surveys of both the planning area and the broader region are essential.

For clarity, this chapter is divided into two sections. The first section addresses the present scenario, relevant Acts and guidelines, previous studies, and earlier efforts by the Pune Municipal Corporation (PMC). The second section presents inferences drawn from these studies and proposes recommendations based on them.

PART I: TRAFFIC AND TRANSPORTATION STUDIES

9.1 Pune City in Perspective of Traffic Transportation

The peri-urban areas of Pune are experiencing rapid economic growth, supported by favorable socio-economic conditions and a conducive investment climate. This growth, along with increased migration and a rising population, has placed tremendous pressure on transport and infrastructure facilities.

Several industrial establishments and industrial areas have been developed by the Maharashtra Industrial Development Corporation (MIDC) along major transportation corridors such as Mumbai-Pune (Pimpri-Chinchwad), Pune-Nashik (Chakan-Bhosari), Pune-Ahilyanagar (Ranjangaon), Pune-Satara (Shirwal), Pune-Solapur (Hadapsar, Kurkumbh), and Pune-Mangaon (Pirangut), etc. The Yashwantrao Chavan Expressway, 'India's first six-lane concrete freeway', serves as a key growth corridor. To sustain the region's thriving economy, comprehensive traffic and transportation planning for these areas has become increasingly important.

9.2 Transport Scenario in Nine Villages and Regional Connectivity

Residential growth in the fringe areas of Pune, including the nine villages under study, has led to a significant increase in daily commuting to the older city areas for schools, workplaces, healthcare facilities, markets, and other services. Population growth, rising employment opportunities, and increasing vehicle ownership in these areas have driven higher travel demand. The choice of transportation mode and modal split depends on travel distance, a person's physical and financial capacity, the nature of work, and affinity for specific modes. However, as the public transport system has not kept pace with the rapid increase in demand over recent years, residents increasingly rely on personal and

intermediate public transport modes, such as private cars two-wheelers, auto-rickshaws, and taxis. According to records provided by the Regional Transport Office (RTO), between 2001 and March 2024, a total of 3,684,964 vehicles were registered in Pune, including 2,563,987 two-wheelers, 1,007,243 four-wheelers, and 113,734 auto-rickshaws, of which 80,825 were electric vehicles. This corresponds to an average of 153,540 new vehicles per year. The rapid growth in vehicles has contributed to traffic congestion, accidents, parking issues, and various forms of pollution.

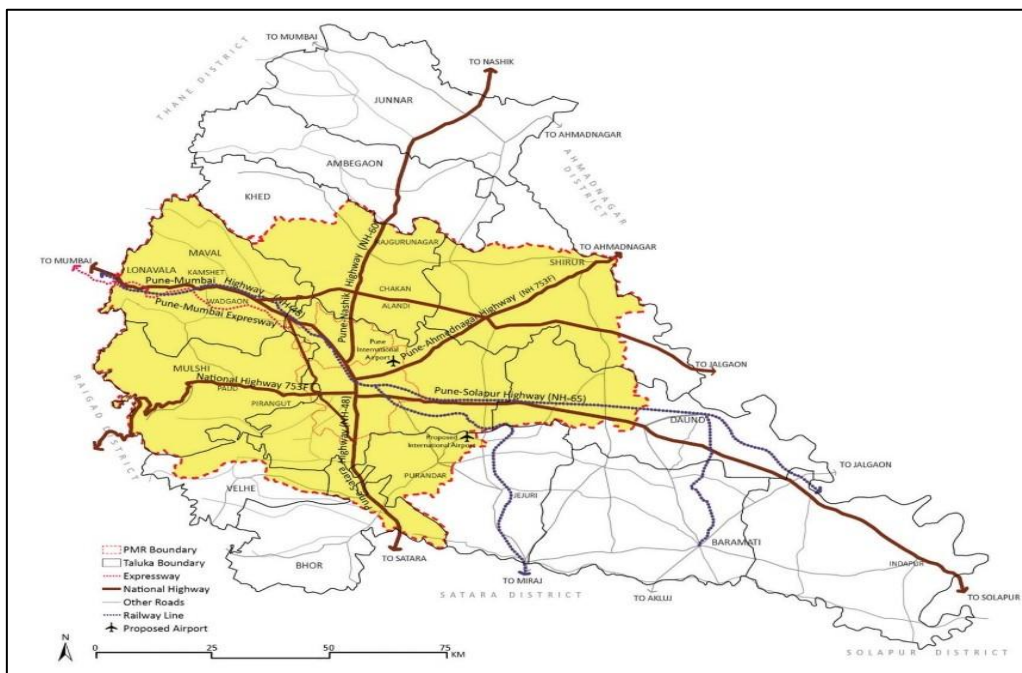
Prior to their merger into the Pune Municipal Corporation (PMC) limits, these nine villages were having Gram Panchayat and also part of the Pune Regional Plan (RP). At the time of merger, very few of the proposed RP roads were fully developed in these villages. Additionally, significant discrepancies exist between the proposed RP road alignments and the approved layouts along those roads, resulting in misaligned road networks, as observed in areas such as Undri and Ambegaon BK.

9.2.1 Regional Connectivity of Pune City and the Planning Area

Pune is well-connected to the rest of the country through a network of National and State Highways, as outlined below:

- i) **Delhi-Chennai Corridor** - NH 48 (formerly NH 4)
- ii) **Pune-Dhule** - NH 60 (formerly NH 3)
- iii) **Pune-Solapur-Machilipatnam** - NH 65 (formerly NH 9)
- iv) **Wadgaon Budruk to Lonikand** - NH 548DD via Katraj-Kondhwa-Undri-Mantarwadi Chowk-Wadki-Loni Kalbhori-Theur Phata-Kesnand, connecting to NH 753F
- v) **Pune-Ahmednagar** - NH 753F (formerly SH 60)
- vi) **Warje-Khadakwasla-Pashan via Mutha-Pirangut** - SH 115

Map 9.1 Regional connectivity of Pune city



Within the planning area, Hadapsar and Mundhwa have direct connectivity via the Pune-Solapur Road. Ambegaon Budruk and Ambegaon Khurd are located along NH 48, while Dhayari and Shivane are also well-connected to NH 48. SH 115 passes through Shivane, and Undri is situated along NH 548DD, providing effective regional accessibility for these villages.

Table 9.1 Major roads in the planning area

Village	NH	SH	MDR/ODR	Proposed Ring Road
Lohgaon	-	Previously SH 60 now NH 753F	MDR 55	PMR Ring Road
Mundhwa	-	-	MDR 34	-
Hadapsar	-	-	-	-
Undri	NH 548 DD	Previously SH 116 now NH 548 DD	MDR 136	-
Ambegaon Budruk	NH 48, NH 548 DD	-	ODR 129	-
Ambegaon Khurd	NH 48	-	-	PMR Ring Road
Dhayari	-	-	-	PMR Ring Road
Shivane and Shivane UT	NH 48		-	PMR Ring Road

Apart from the major highways, the region is served by numerous access and feeder roads. Three primary railway routes originate from Pune Junction: Pune-Lonavala-Mumbai, Pune-Solapur, and Pune-Saswad-Miraj. The Pune-Solapur route passes through the newly merged Hadapsar village. Pune International Airport is located near the newly included village of Lohgaon. Roads connecting the airport require widening, along with the development of new links to improve connectivity with other parts of the city.

9.3 Traffic and Transportation Policies Guidelines by Central/ State Government, Recommendations by Government / Institutes and Acts

As part of efforts to improve traffic and transportation (T&T) facilities and to ensure uniformity in T&T infrastructure across India, several policies, guidelines, and recommendations have been framed and issued over time. While preparing T&T proposals for the newly merged nine villages, due consideration was given to the following key policies and guidelines.

- National Urban Transport Policy (NUTP), 2006
- Indian Roads Congress (IRC) Guidelines
- UTTIPEC (Unified Traffic and Transportation Infrastructure Planning & Engineering Centre) Guidelines
- Motor Vehicles Act, 1988
- Persons with Disabilities Act
- Guidelines and Toolkits for Urban Transport Developments
- National Policy for Street Vending, 2009

- Study of Traffic and Transportation Policies and Strategies in Urban Areas in India, 2008

Expert bodies such as the Central Institute of Road Transport (CIRT), the Public Works Department (PWD) of Maharashtra, Rail India Technical and Economic Services Limited (RITES Ltd.), and the Traffic Cell of the Town Planning Department have conducted comprehensive studies to identify capacity constraints in the existing transportation system. Based on their findings, they have recommended several interventions, including the addition and expansion of the transportation network through Inter-city Transportation and High-Capacity Mass Transportation Routes (HCMTR), construction of bypasses to national highways and expressways, upgradation, strengthening, and construction of road links and missing links, as well as augmentation of railway lines and railway services. Many of these recommendations are particularly relevant to the newly merged nine villages.

9.4 T&T Related Provisions in Development Control and Promotion Regulations

Building activities and development works in the State are governed by Unified Development Control and Promotion Regulations (UDCPR2020), published by Maharashtra Govt., along-with the DP for city area. T&T related provisions are as below.

- i) **Clause no 3.13.2 - Development of Cycle track along River and Nalla:** A cycle track shall be developed in green belt areas earmarked in the DPs along rivers and major nallas. Out of the 6.0 m distance from the edge of minor watercourses (nallas) left as marginal distance from any building, a 3.0 m strip shall be available for use as a cycle track for the general public.
- ii) **Clause no 4.13 - Traffic and Transportation Zone:** In T&T zones identified in the DPs, all uses related to surface, water, and air transportation, including parking and ancillary uses, shall be permissible. Additionally, separable lands of railways may be developed for uses permissible in Commercial zones.
- iii) **Clause no 4.25 - Airport and Allied Activities/ Service Zone:** Airport-related activities and services incidental thereto are allowed within this zone.
- iv) **Clause no 5.1.5 - Highways Notified by State/Central Government:** The alignment of any highway, ring road, expressway, or any other classified road notified by the State or Central Government Highway Authority and passing through the planning area shall be deemed part of the Regional Plan/Development Plan.

9.5 Earlier efforts regarding Transportation in Pune city

In a bid to cope up with the ever-increasing demand of traffic and transportation facilities many policies and proposals were framed based on traffic studies as enlisted below:

9.5.1 Mass Rapid Transits System for Pune Metropolitan Area, Jan 2001

For estimated 91 lacs passenger trips by all modes in Pune Metropolitan Area by Year 2026, MRTS network comprising 6 lines (91.28 km) were proposed by RITES Ltd.

9.5.2 Comprehensive Traffic and transportation Study, 2003:

The recommendations mainly included measures for short term goals like improvement of existing roads and long-term goals like completion of Outer and Inner Ring Road, construction of 9 flyovers, cycle tracks, Bus & Truck terminals, Parking Improvement, Makeover of Public transport System.

9.5.3 Sky Bus, 2004:

Konkan Railway Corporation Ltd. (KRCL) proposed “Sky Bus Metro System” for Pune City, based on Traffic forecasts by RITES, with two alignments (A- Aundh to Warje -14 km and B- Pune Railway Station to Shivaji Bridge-7.24 km).

9.5.4 Integrated Traffic Dispersal System, 2004

A master plan for the road network in PMC and PCMC area was prepared proposing, widening of existing roads, elevated roads, 9 ROBs, 2 Bridges over rivers, 14 Flyovers and missing links for proper traffic management.

9.5.5 Tramways, 2007

A 92 km long Tramway network within the ROW of existing roads was proposed with estimated ridership of 2,98,500 per day to be developed in two phases.

9.5.6 Comprehensive Mobility Plan for Pune City, 2008

In compliance of National Urban Transport Policy (NUTP) for India published by Ministry of Urban Development; Govt. of India in 2006, Comprehensive Mobility Plan (CMP) 2008 for Pune city was prepared with an objective of Moving people safely and economically by emphasizing public transport and non-motorized transport, thus proving to be a tool for “Low Carbon Transport”.

The following Mobility Action Plans were given due weightage in formulation of CMP 2008.

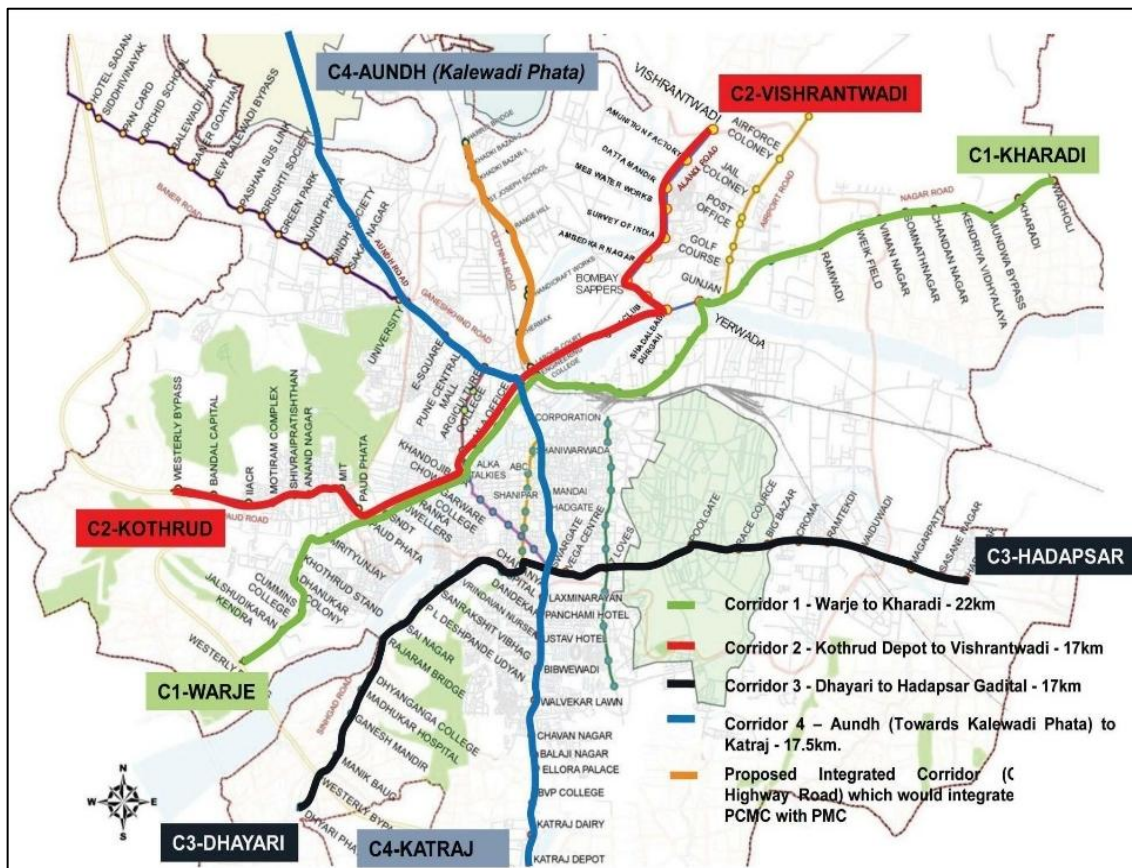
- i) Mobility Corridor Plan.
- ii) Non-Motorized Transport Plan.
- iii) Travel Demand Management Plan
- iv) Traffic Management Plan.
- v) Flyovers and Bridges Plan.
- vi) Road Maintenance & Management Plan
- vii) Passenger & Commercial Terminal Plan
- viii) Public Transport Plan.

In addition to laying emphasis on these Mobility plan action items, groundwork for parking management plan, bicycle network, pedestrian crossings was done. This groundwork paved the way for formulation of policies and Mobility Plans by PMC in future.

9.5.7 Bus Rapid Transit System (BRTS), 2008

Master plan proposing 21 BRT corridors and River side roads, Bicycle Network integrated with other modes of transportation was prepared by Central Institute of Road Transport (CIRT). It is being implemented in phases. Following map shows the BRTS routes

Map 9.2 Proposed master plan of BRTS in Pune city



9.5.8 Efforts taken by PMC consequential to CMP for Pune 2008

9.5.8.1 NMT cell: A Non-Motorized Transport (NMT) Cell was set up in 2008 with an objective to plan and maintain consistent, high quality pedestrian infrastructure with equitable allocation of road space. The NMT Cell has developed a 75 km footpath so far, along BRT corridors and complementary 15 km bicycle tracks on Sancheti-Aundh Road, Wakdewadi - Harris Bridge, Nagar Road, Satara Road and Sinhagad road. It is also involved in implementation of the Comprehensive bicycle plan for Pune City.

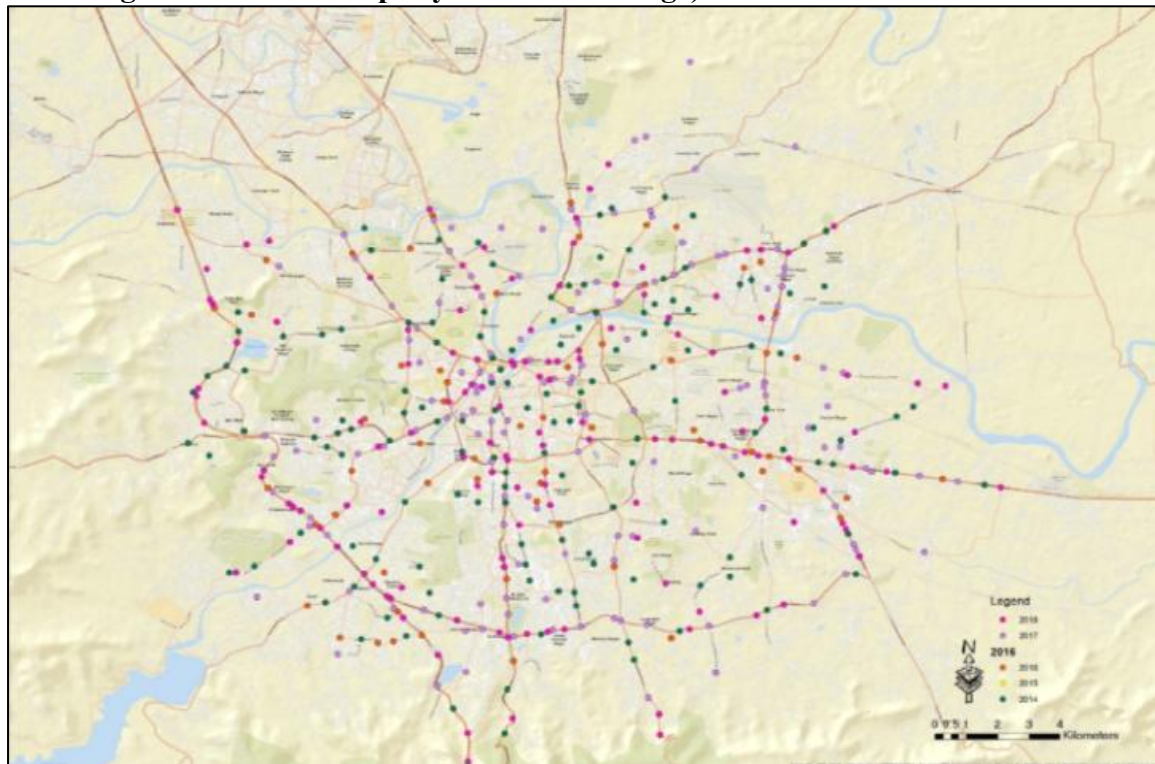
9.5.8.2 Road Safety Audit: Central Road Research Institute (CRRI) developed guidelines for Road Safety in 2003. It developed a Manual on Road Safety Audit in 2010 with Indian

Roads Congress (IRC) providing standard guidelines for assessing safety improvement of the roads.

Pune stood at 19th position as per the MoRTH's study (2016 report) on road accidents in million plus cities in India, in terms of higher accident severity with an average score of 29.8 fatalities per 100 accidents. PMC has taken up Road Safety Audit for developing the Road Safety Improvement Plan for the urban road network (total length of 1000 km). Generalized and Spot specific detailed study collected data regarding-

- Road network details - Length, type, and capacity of the road.
- Road infrastructure – availability of median, shoulder, footpath, cycle track, proper surface illumination.
- Road furniture – pedestrian crossings, availability of traffic calming measures, cat eyes, pavement markings, chevron signs, signal heads.
- Location of critical and sensitive zones like – schools, colleges, hospitals etc.
- Accident data and blackspots- Map of fatal accidents for the total city road network is prepared with accident data from City Traffic Police Department, as shown below.

Map 9.3 Fatal Accident Spots in Pune city in year 2014 to 2018 (with 1400 deaths and 900 grievous accidents per year on an average)



Source: CMP 2018-2038 Prepared by PMRDA

It was observed that major accident blackspots are on arterial and sub-arterial roads in the city. Speed, visibility, merging and demerging, encroachment, inconsistency in the carriageway widths, variation in physical infrastructure, illegal on-street parking and the driving behaviors are main factors responsible for accidents. Different parameters useful in estimating risk levels of roads, were considered for Road Safety assessment. Road wise specific recommendations regarding geometric corrections, infrastructural improvements,

speed calming and traffic calming measures, enforcement related issues, visibility/illumination issues, illegal encroachment on the roads were provided for every road. The report on Road Safety Audit also suggests educating commuters and promoting the use of helmets on 2 wheelers, use of seat belts in cars, making the road users understand importance of safety for vulnerable road users (VRU), traffic calming measures on the local roads, segregated lanes for cyclists, pedestrians as supplementary measures for road safety.

9.5.9 Major Policies, Plans and Guidelines relevant to CMP 2008

9.5.9.1 Hawker's Policy:

The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act 2014, provides for regulating street vending activities & protecting rights of urban street vendors. As per provisions, the Town Vending Committee shall issue certificates of vending to street vendors identified under the survey.

'Hawker's Policy' for street vendors was formulated, in light of the Street Vendors Act, 2014, National Policy for Street Vending, 2009, National Building Code and MRTP Act 1966; with an objective of appropriate rehabilitation of street vendors to keep the roads in the city, with heavy traffic, free for traffic and footpaths for pedestrians. Hawkers are banned from doing business on roads and required to leave $\frac{2}{3}$ rd of every footpath free for walking.

Town Vending Committee (TVC) is set up by Pune Municipal Corporation under Section 22 of Street Vendors Act, 2014. TVC has drawn up a list of 525 hawker zones (considering road width, traffic flow and pedestrian movement), 45 roads & 153 chowks as no-hawker's zones (such as bus stops, small pavements and narrow streets or lanes). Vending on the black top of the road is strictly prohibited. Survey of Hawkers is to be done every five years to issue certificates to the eligible hawkers in declared hawkers' zones.

PMC has completed a biometric survey of 23171 hawkers and issued certificates to 12026 eligible hawkers as of now.

9.5.9.2 Urban Street Design Guidelines 2016 (USDG):

Pune has developed "Urban Street Design Guidelines" in 2016, with an objective of defining and initiating a process to ensure appropriate implementation of street types and street design elements. It would help to create better streets, to support transportation objectives for the city considering present and future needs and to create design guidelines for streets which prioritize streets for people and not for vehicles. It proposes Street typology with proposed street hierarchy in Pune and gives Design recommendations on layout, surface, level, inter-sections, cycle tracks, carriage way, shoulders, parking, footpath, BRT lanes, bus-stops and also Traffic calming & Safety measures like Speed breakers, traffic signals, Central medians, railings and Bollards, Street lights, Street furniture, Signages, Road markings etc. It proposes Multi Utility Zone (MUZ) for Utility services, Street plantation, Garbage-bins, Public Toilets etc. The USDG provides standard drawing templates for street cross-sections of various widths (ROW) and also for intersections. USDG complies with IRC Guidelines, Motor Vehicles Act 1988, Disabilities Act, Guidelines and Toolkits for Urban Transport Developments, National Urban Transport

Policy (NUTP) 2006, 12th Five Year Plan, National Mission on Substantial Habitats, UTTIPEC Guidelines, Study of Traffic and transportation policies and strategies in Urban areas in India 2008.

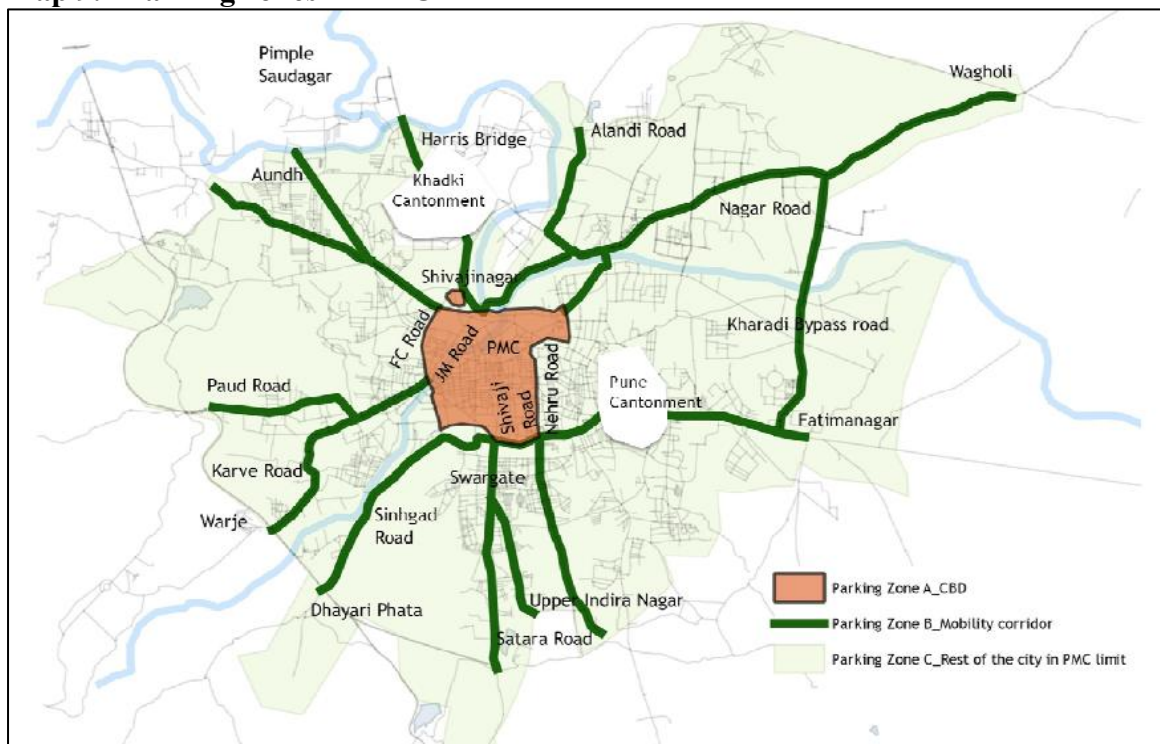
9.5.9.3 Parking Policy:

The Comprehensive Mobility Plan / Transport Master Plan of City is based on “NUTP 2006”, by the Ministry of Urban Development; GOI. It requires Parking Policy at city level for supplying adequate parking spaces to discourage haphazard parking along roads.

PMC has framed a Parking Policy approved vide General Body Resolution No. 1092, Dated 23.03.2018, on the basis of CMP of Pune 2008. The objective was reducing motorized trips by public transport to 80% with at least 50% reduction in total Vehicle Kilometer Travelled (VKT), by year 2031, by creating an effective Parking Management System, transforming 10% on street parking spaces to public open spaces or NMT infrastructure by rationalization of parking spaces. PMC has formulated Off-street parking and On-street parking management in multiple parking districts of the city. Legal provisions from MMC Act 1949 (Section 243, 208), Maharashtra Motor Vehicle Act 1989, Motor Vehicle Act 1988 (Section 117,122 and 127) were referred to, while framing the Parking Policy.

For implementation of public parking PMC has earmarked 3 parking zones in the city, Parking Zone A mainly the CBD (area bound by major streets), Zone B comprising of mobility corridors along the major roads radiating from CBD and the rest of the city in PMC limit as Zone C, as shown below-

Map 9.4 Parking zones in PMC



Source: Parking Policy 2017 by PMC

Base rates for ‘On-street’ and ‘Off-street’ parking and Parking Fee revision formula for arriving at annual parking rates in any financial year are provided, with concession to some

of vehicles like paratransit, Ambulances, Vehicles of specially-abled people, Bicycles parking PMPML buses, etc. Currently PMC has developed 32 no. of parking sites with capacity of accommodating 30178 no. of two wheelers and 2675 no. of four wheelers in the city.

9.5.9.4 Comprehensive Bicycle Plan 2017 (CBP):

Sustainable solution to the traffic problem is providing efficient public transport system and safe, adequate facilities for pedestrians and cyclists, to reduce the number of vehicles on roads.

Pune City boasts the status of first city in the country to have a Comprehensive Bicycle Plan. The Central Govt. sanctioned 'Terms of Reference' for preparation of comprehensive study for CBP for Pune on 20.02.2014. Accordingly, the details of CBP with 824 km of cycle tracks (present 40 km) and parking at 806 locations with capacity of 14,000 bicycles were sanctioned by PMC on 14.12.2017. The cycle tracks include rejuvenated existing cycle tracks, new dedicated cycle tracks along the roads, earmarked painted tracks on roads, Greenway Cycle Tracks and Composite Cycle Tracks with pedestrian ways depending on the width of the road and requirement. As directed by the Central Govt, State Govt has notified for inclusion of CBP as a part of Master Plan for respective Local Planning area. CBP is being extended progressively to include streets in newly merged areas in the PMC.

The plan is in compliance with the guidelines on Sustainable Habitat Mission and helps in creation of appropriate institutional structures and directing investments for cycling improvement which will in turn support the policy of NMT and use of public transport. The objective of the plan is to develop a Public Cycle System, to accord high priority for integration of various modes of transport including NMT. The main goals set by the Plan include improving the modal share of cycling in the city from the current 3% to 25%, creating appropriate institutional structure (to anchor, implement, and review the Pune Cycle Plan), ensuring public engagement in development and monitoring of cycle and walk friendly infrastructure, making travel demand management strategies sensitive to cycling and users of non-motorized vehicles, providing secure parking for bicycles, providing walk and cycle - friendly routes, adequate bicycle parking facilities and bicycle training to pupils in schools.

9.5.9.5 Pedestrian Policy:

Walkability has been studied as an outcome of the built environment and linked with better health outcomes and completeness of transportation networks. In view of providing safe, adequate, usable, consistent and high-quality pedestrian infrastructure with equitable allocation of road space, Pedestrian Policy for Pune City was sanctioned vide GB resolution no.543 Dated 23.08.2016. It is in conformation with relevant IRC guidelines, STAC report, USDG Pune, Design of Urban Roads_Code of Practice_MoUD and policy guidelines like NUTP, standards for National mission for Sustainable habitats. The Goals of Pedestrian Policy include safety and comfort for all pedestrians, improved access and mobility for all citizens at all times and also creation of 'pedestrian only zones. As a part of the Policy, smart pedestrian streets were conceptualized with demarcated zones for vehicles, bicycles and pedestrians, to ensure a sustainable mobile ecosystem. In "Walk Smart", the Policy for Pedestrian Safety and Comfort, Pune city elaborate provisions were made for specifications

of Footpaths, At Grade Pedestrian Road crossings, Foot over Bridge and Pedestrian Subways.

9.5.9.6 Smart City Street Development:

In 2015, Government of India launched Smart City Mission and as a part of the Mission, concept of a 'Smart Street' was put forth. Urban mobility is envisaged as Smart Solution under Smart Cities Mission, which involves road network for vehicles, public transport, pedestrians and cyclists. Necessary administrative services are offered within walking or cycling distance. Major streets in Pune like Fergusson College Road, Jangli Maharaj road and ITI road are being redesigned under Smart City Mission, with public spaces along sidewalks, provisions for street vendors, CCTV installation, central monitoring facility, solar light installation etc. This project can put a value to NMT through which costs are saved in monetary terms as well as in terms of reduced emissions as a ripple effect.

9.6 Regional Plan Proposals in Nine Villages

Following T&T proposals in RP 1997 concerned with the Planning area which are considered for proposals in the Development Plan.

Table 9.2 List of Village and Respective Sector-wise Proposed RP roads in Nine Villages

Village	Planning Unit of Regional plan	Proposed RP Road		
		Sr No	Description	Width (m)
Ambegaon Bk	Sector E and F	1	Road link from Sr no 15 to Sr no 8	24
		2	Pune old limit (Ambegaon Bk) to Narhe	30
Ambegaon Kh	Sector E and F	1	Ambegaon Kh Gaothan to Sr no 10 and Sr no 39	15
Dhayari	Sector E	1	On common boundary of Pune old limit (Dhayari) & Newly included Dhayari	30
		2	Dhayari Gaothan to Narhe	18
Hadapsar	Sector G	1	Magarpatta road to Manjari Bk	24
		2	Sade Satara Nali to Keshav Nagar through Amanora Township	18
		3	Magarpatta road to Amanora Township	18
		4	Link from (PMC Old limit) Hadapsar to Mundhwa (K'nagar) Boundary to road through Amanora township	18
		5	Sadesataranali to Manjari through Serum Institute	12

		6	Serum Stud Farm to Vithhalnagar	12
		7	(PMC Old limit) Hadapsar to Mundhwa Keshavnagar Boundary through Vithalwadi- Railway crossing	18
Lohgaon	Sector H	1	Dhanori- Wagholi road to Charholi	30
		2	Dhanori- Wagholi road to Nirgudi	30
		3	Dhanori limit to Lohgaon Gaothan	24
		4	Dhanori to Wagholi road	24
Mundhwa	Sector G	1	Mundhwa - Manjari Bk road	18
		2	PMC old limit (Mundhwa) upto Sr no 16	24
		3	Sadesataranali (Vithalwadi) Railway crossing to KCIT road	18
		4	Sadesataranali to Manjari road through Underpass built by Amanora Township	18
Shivane & Shivane (UT)	Sector D	1	Warje - NDA Road	36
		2	Road along Mutha River	30
Undri	Sector G	1	Undri Gaothan to Handewadi	24
		2	Pisoli to NH548DD	24
		3	Pisoli to Handewadi (NH-548)	84
		4	Kad Nagar to CAELUM School	24
		5	CAELUM School to SH-116	24
		6	Kad Nagar to Sr no 17 Existing-Main Road	24
		7	Undri Gaothan to Mohammadwadi road	24
		8	Road along Undri- Mohammadwadi village boundary	24

Following table enlists the revised road network in R.P. (1997) within 10 km distance from PMC and PCMC limits (Sanctioned/modified by Maharashtra Government u/s 20 (4) of MRTP Act, 1966 vide notification no TPS 1812/844/CR-182/12 Reconstruction no 68/UD-13 dated 07/09/2013) are considered for proposals in the planning area-

Table 9.3 List of Village and respective sector-wise proposed roads u/s 20 of MRTTP Act; 1966 in the planning area

Village	Planning Unit of Regional Plan	Modification of Regional plan u/s 20 (4) of MRTTP Act, 1966		
		Sr. No.	Description	Width
Ambegaon Bk	Sector E and F	1	Pune old limit (Ambegaon Bk) to Newly included Ambegaon Bk through Sr no 14,15,16	18 m
Ambegaon Kh	Sector E and F		-----	-----
Dhayari	Sector E	1	Pune old limit (Dhayari) to Newly included Dhayari through Sr no 6,7,8 along Nalla	18 m
		2	Pune old limit (Dhayari) to Newly included Dhayari through Sr no 10 to Sr no 48	18 m
		3	Link from Dhayari Sr no.117 towards southern sided road proposed u/s 20 (3), 20 (4)	30 m
		4	Road connecting village Kirkitawdi to Narhe	30 m
Hadapsar	Sector G		-----	-----
Lohgaon	Sector H	1	Link road to join Lohgaon- Wagholi- Lonikand village	24 m
Mundhwa	Sector G	1	KCIT road to Mula-Mutha River through Sr no 9 to 14/2	24 m
Shivane & Shivane (UT)	Sector D		-----	-----
			-----	-----
Undri	Sector G	1	Undri Gaothan to Hadewadi	15 m

9.7 Comprehensive Mobility Plan (CMP) 2018-2038 for Pune Metropolitan Region

As per MoHUA, CMP needs to be prepared every 5 years with an integrated approach for the region. L&T Infrastructure Engineering Limited has prepared CMP for the period of 2018 to 2038 for the Pune Metropolitan Region. The objectives of CMP 2020 are improvement of mobility and livability in the city, improvement in safety and security for pedestrians, NMT, increase in sustainable transport mode share with decreased private motor vehicle use, achievement of desirable indicators and benchmarks.

Focus of the CMP is PMC, PCMC and core PMR area. The inferences, projections, proposals and suggestions in CMP are referred to while preparing the Development plan for these nine villages. Details of CMP are briefly described in the following paragraphs.

9.7.1 Methodology

Data - Cordon Surveys, Screen Line Surveys, Origin and Destination surveys, Household Surveys, parking surveys, activity place survey and Mode Share Surveys were conducted yielding statistics regarding Traffic intensity, Traffic Composition, Peak Hour traffic, Average speed and delay, Traffic pattern of the passenger vehicles. The employment data is compiled based on the Census, household survey and industrial employment data obtained from the Directorate of Industries, Pune.

Assessment- Existing transport and infrastructural facilities are assessed based on service level performance benchmarks. Population forecast is made based on past trends, development plan, growth direction, population density, availability of developable land, current and future accessibility. Various scenarios tested for the Travel Demands are studied, estimated and discussed during all phases to understand the issues and arrive at optimum solutions. Based on the analysis of various parameters, current and proposed land-use, discussions with various agencies like MIDC, Hinjewadi Industrial association, etc. Future growth direction of the region is conceptualized.

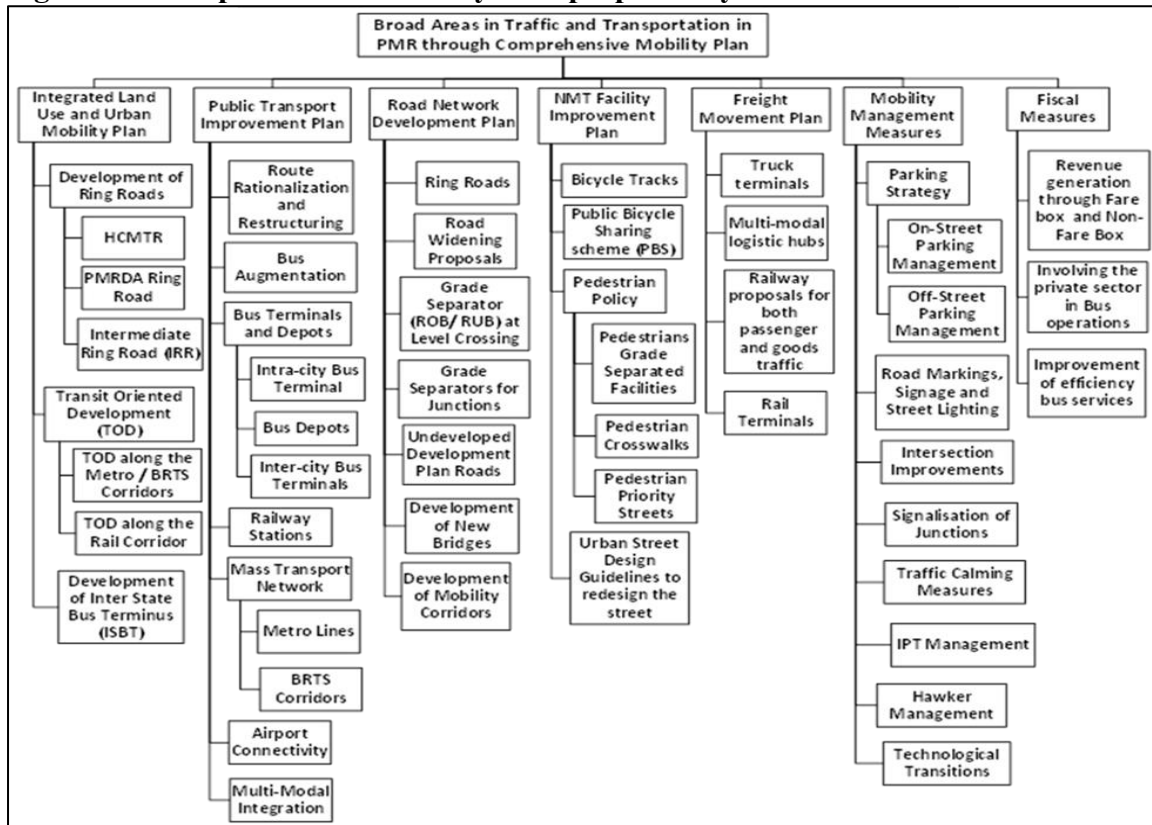
9.7.2 Traffic and Transportation Sections in PMR as per CMP 2018-2038

The CMP comprises the following sections to cater to different modes of transport and users.

- i) Integrated Land use and Urban Mobility Plan
- ii) Public Transport Improvement Plan
- iii) Road Network Development Plan
- iv) NMT Facility Improvement Plan
- v) Freight Movement Plan
- vi) Mobility Management Measures
- vii) Fiscal Measures

The sections are schematically listed down as shown below in Fig 9.5:

Figure 9.1 Comprehensive Mobility Plan prepared by PMRDA



9.8 Transportation Projects in PMR

The major transportation infrastructure and urban development projects that have been initiated recently in Pune Metropolitan Region (Some of which are proposed in CMP 2018):

9.8.1 128 km long Ring Road proposed and to be executed by PMRDA

In the region, development of radial roads is predominant. Efforts are underway to develop the 65 m wide Regional Ring Road of length 128 km covering 29 villages which will connect 4 radial highways namely Pune-Nashik, Mumbai-Pune-Solapur, Pune-Ahmednagar and Pune-Satara along the periphery of the city. Being implemented by PMRDA with an objective of the Ring Road diverting regional truck and passenger traffic onto the ring road, relieving congestion within the city. It also aims to catalyze the dispersal of urban growth and Multimodal integration which involves homogeneous public transit network, seamless transfer from both private and public modes, passenger amenities and ease of use. PMRDA is planning to develop around 20 T P schemes at various locations along the ring road to integrate the land-use with transport.

9.8.2 Metro Corridors

Based on traffic demand, the public transport system is selected, depending mainly on demand level on a corridor, available ROW, possibility of widening the ROW, land-use and capacity of the system. Beyond the demand level of about 20,000 peak hour peak direction traffic (PHPDT), metro is to be the only choice. In Pune Metropolitan Area, initially 6 alignments were finalized radiating from Agricultural College to various parts of the city. Eventually the proposed Metro Rail alignments were revised and increased.

The Metro network (including Metro Corridors and Light Metro Corridors) recommended to be developed till 2038 with a total length of 195.76 km, is as follows:

Metro Corridors

- i) Nigdi- Katraj (33.63 km),
- ii) Chandani Chk- Wagholi (25.99 km),
- iii) Hinjewadi- Shivajinagar (23.33 km), Shivajinagar- Hadapsar (11.74 km),
Hinjewadi- Chakan (30.08 km),

Light Metro Corridors

- i) Sinhagad Road- Pune Cantonment (9.08 km),
- ii) Warje to Swargate (8.87 km),
- iii) Wagholi- Pawar Vasti- Hinjewadi (35.23 km)
- iv) Chandani Chowk- Hinjewadi (17.81 km).

Also, a Metro Corridor along the Ring road is recommended. The aforementioned Metro Alignments are subjected to DPR for finalising the exact alignments.

9.8.3 Greenfield Airport

New green field airport is proposed at Purandar, Pune District, as mentioned in CMP 2018. Major access roads proposed from airport to various locations are:

- i) Hadapsar- Saswad Road from Dive Ghat,
- ii) Saswad- Pune Road from Bopdev Ghat,
- iii) Uruli-Kanchan Jejuri Road,
- iv) Saswad- Kapurhol- Bhor Road,
- v) Khed Shivapur- Saswad Link Road.

A High-Speed Airport Metro Link from Hadapsar to Airport is also proposed. A metro line (top speed of 135 kmph) is proposed with Bus services to integrate with the Airport terminal.

9.8.4 Hyper-loop connecting Pune with Mumbai

Mumbai to Pune hyper-loop is a proposed system of transport that will run between the cities based on the phenomenon of electric propulsion. The hyperloop pod would move through a low-pressure/ vacuum tube, enabling high-speed transport in absence of air resistance. The project will bring down travel time between the two cities to just 25 minutes against 3-3.5 hrs at present.

9.8.5 Bus Rapid Transit (BRTs)

PMPML is operating 61 km of BRTS on various routes mostly with dedicated lanes. It is running in mixed traffic conditions on several critical sections, with no grade separation at some intersections, but has signal priority. The network is disjointed. The system lacks intermodal stations to transfer the passengers from one line to another. The condition of buses needs improvement. PMRDA has proposed another 50 km of BRTS routes which include remodeling of existing BRTS.

9.8.6 Pune-Nasik Semi High-Speed Railway

Pune-Nasik Semi High- Speed Double Broad-Gauge Rail line, proposed by Maharashtra Rail Infrastructure Development Corporation Ltd (a joint venture of Govt. of Maharashtra and Ministry of Railways) also passes through the planning area of newly included nine villages.

9.8.7 Mumbai-Hyderabad High Speed Rail Corridor

National High-Speed Rail Corporation Ltd (NHSRCL) is preparing a Detailed Project Report for the proposed Mumbai-Hyderabad high speed rail corridor. The length of the proposed Mumbai-Hyderabad HSR corridor is approximately 650 km, which passes through the planning area of newly included nine villages.

9.9 Analysis of the Traffic and Transportation conditions in the planning area

Brief analysis on the basis of Traffic Surveys (in CMP2018 and other):

- i) Highest traffic volume is observed on NH 753F (Nagar Road)
- ii) Goods vehicle share is considerably high on Saswad Road, Solapur Road. Two-wheeler share is significantly high on all roads particularly on Lohgaon- Nirgudi Road, NDA Academy Road and Manjari Road indicating more of local trips
- iii) Average journey speed of 16.5 kmph in the planning area
- iv) Location wise Internal to Internal travel pattern of passenger vehicles found maximum on Lohgaon - Wagholi road followed by NDA road whereas Internal to External travel pattern found maximum on Sinhgad road and Nagar road.
- v) Percentage of single lane and intermediate lane roads is more in the planning area.
- vi) There is a lack of the service lanes along highway and bypass, wide internal roads with footpaths and linkages to form loop roads.
- vii) The area under existing roads and Traffic & Transportation of each village is worked out on the basis of physical survey is presented in the following Table:

Table 9.4 Existing share of traffic and transportation in the planning area

Sr No	Village	Developable Area in Ha	Total Length of Connectivities in km	Total Area under Roads (T&T) in Ha	% of existing T&T Area with Developable Area
1	Lohgaon	1773.63	106.101	115.63	6.52 %
2	Mundhwa	430.46	27.852	29.90	6.95 %
3	Hadapsar	320.02	24.138	28.10	8.60 %
4	Undri	430.14	30.122	37.79	8.78 %
5	Ambegaon Bk	243.37	25.500	34.64	14.23 %
6	Ambegaon Kh	98.80	42.021	15.57	15.75 %
7	Dhayari	459.39	46.345	35.62	7.75 %
8	Shivane & Shivane (UT)	182.84	23.412	24.84	13.58 %

Total area under transportation is 350.252 Ha This accounts for 6.24% of the planning area. (As per norms T & T area needs to be between 12 to 15 % of total area.)

9.10 Existing issues of Traffic and Transportation in the planning area

The nine newly merged villages of PMC have seen rapid urban growth, placing heavy pressure on existing road networks and mobility systems. Rising travel demand, limited

connectivity, and inadequate transport integration highlight the need for systematic upgrades to ensure safe and efficient movement up to 2043.

Table 9.5 Existing issues of traffic and transportation in the planning area

Sr. No.	Village	Existing issues
1	Lohgaon	Pothole-ridden roads, ongoing repair works causing jams, heavy delivery vehicle movement, poor public transport.
2	Mundhwa	Congestion on Mundhwa-Kharadi and Koregaon Park routes, accident-prone junctions, limited road capacity, weak transport links.
3	Hadapsar	Severe congestion at Saswad Road, Solapur Road and Gadital, degraded internal roads, poor parking management, frequent encroachments.
4	Undri	Narrow roads, encroachments, wrong-side driving, frequent accidents, lack of parking.
5	Ambegaon Bk	Narrow and poorly maintained roads, steep slopes near Dattanagar Chowk, unsafe bridges, poor lighting, lack of transport facilities.
6	Ambegaon Kh	Bottlenecks at Ambegaon-Katraj junction, encroachments, inadequate road widths, poor pedestrian safety, weak public transport.
7	Dhayari	Incomplete DP roads, narrow road space, stormwater works causing jams, heavy vehicle parking, poor traffic enforcement.
8	Shivane & Shivane (UT)	Encroached internal roads, poor junction management, flooding disrupts mobility, weak connectivity, limited public transport.

PART II: TRAFFIC AND TRANSPORTATION PROPOSALS IN NINE VILLAGES (BASED CMP 2018-2038)

The traffic and transportation proposals in the Development Plan for nine villages are based on the following proposals of Comprehensive Mobility Plan 2018-2038.

9.11 CMP Proposals/ Recommendations

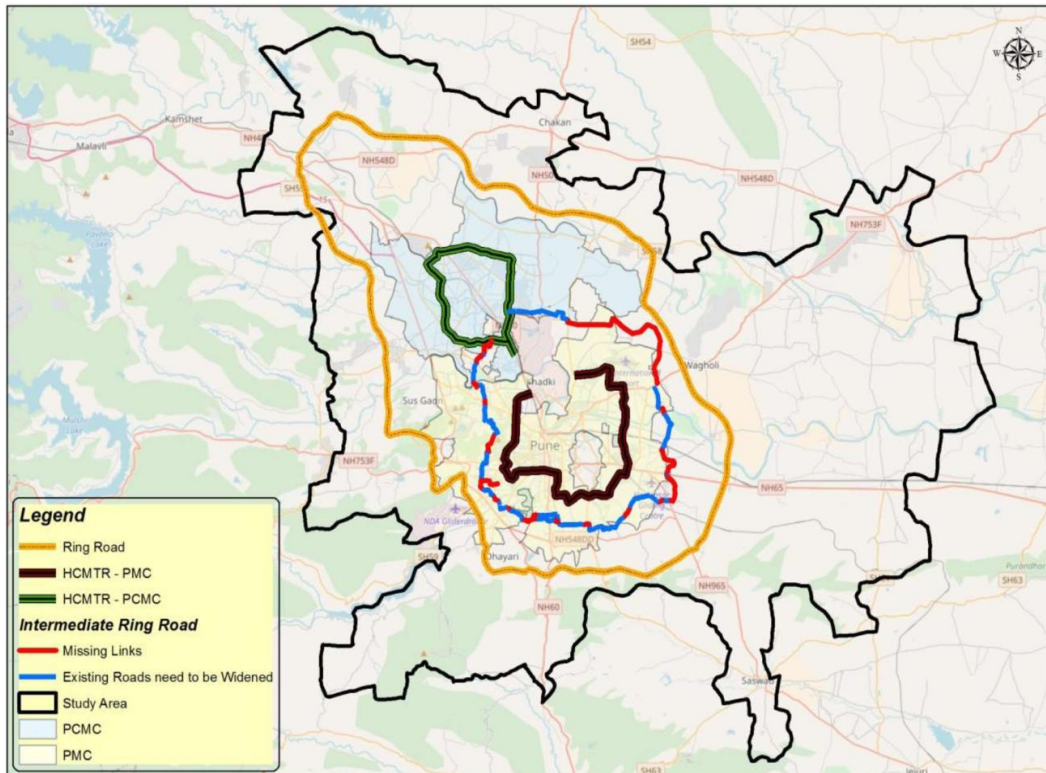
Comprehensive Mobility Plan 2018-2038 gives recommendations and proposals for improvement in existing traffic conditions and for the future needs of the area with sustainable solutions, in PMR. The CMP 2018-2038 proposals are framed to meet NUTP objectives. The proposals related to and having impact on the planning area incorporated in the proposed DP, summarized as per relevant NUTP objective, are as follows-

9.11.1 NUTP objective-Integration of Land-use and Transport Planning

9.11.1.1 PMRDA Ring Road: The objective of the 128 km long Ring Road is to catalyse the dispersal of urban growth and to divert regional traffic onto Ring Road to relieve congestion in the city. It passes through Shivane, Dhayari, Ambegaon Kh, and Lohgaon among nine villages.

9.11.1.2 Intermediate Ring Road: The Intermediate Ring Road mainly comprises of proposed missing links between various existing major roads to form a continuous Ring Road. In spite of constraints for development along the alignment like hills, Defence Land etc., Intermediate Ring Road will relieve major traffic on HCMTR and Regional Ring Road.

Map 9.5 Proposed ring roads in the Pune Metropolitan Region



Source: CMP 2018-2038 Prepared by PMRDA

9.11.1.3 Transit Oriented Development (TOD): TOD zone is proposed along Metro/BRTS Corridors and Rail Corridors in Pune region. TOD zone in nine villages along the Proposed Metro lines and BRTS will be as per Government Directives.

9.11.1.4 Inter-State Bus Terminus: Out of 5 newly proposed Inter State bus terminus (ISBT) in PMR, 3 at Lonikand- Nagar Road, Loni Kalbhor-Solapur Road and Mangadewadi -Satara Road are within 10 km of nine villages, thus impacting the planning area.

9.11.2 NUTP objective - Integrated Public Transport Systems

Desired share of public transportation as per URDPFI for a City with population 6 million is 70%, applies to Pune.

9.11.2.1 PMPML Bus service- Route Rationalization and Restructuring: Instead of present long-distance routes of PMPML incurring losses, short to medium distance services with high frequency and with good transfer facilities (Hub and Spoke concept) is recommended. Increasing services to rapidly growing areas in suburbs like Charholi, Wadgaon Shinde, Manjari Kh, Kirkitwadi, Handewadi will benefit the adjacent planning area.

9.11.2.2 Bus Terminals and Depots:

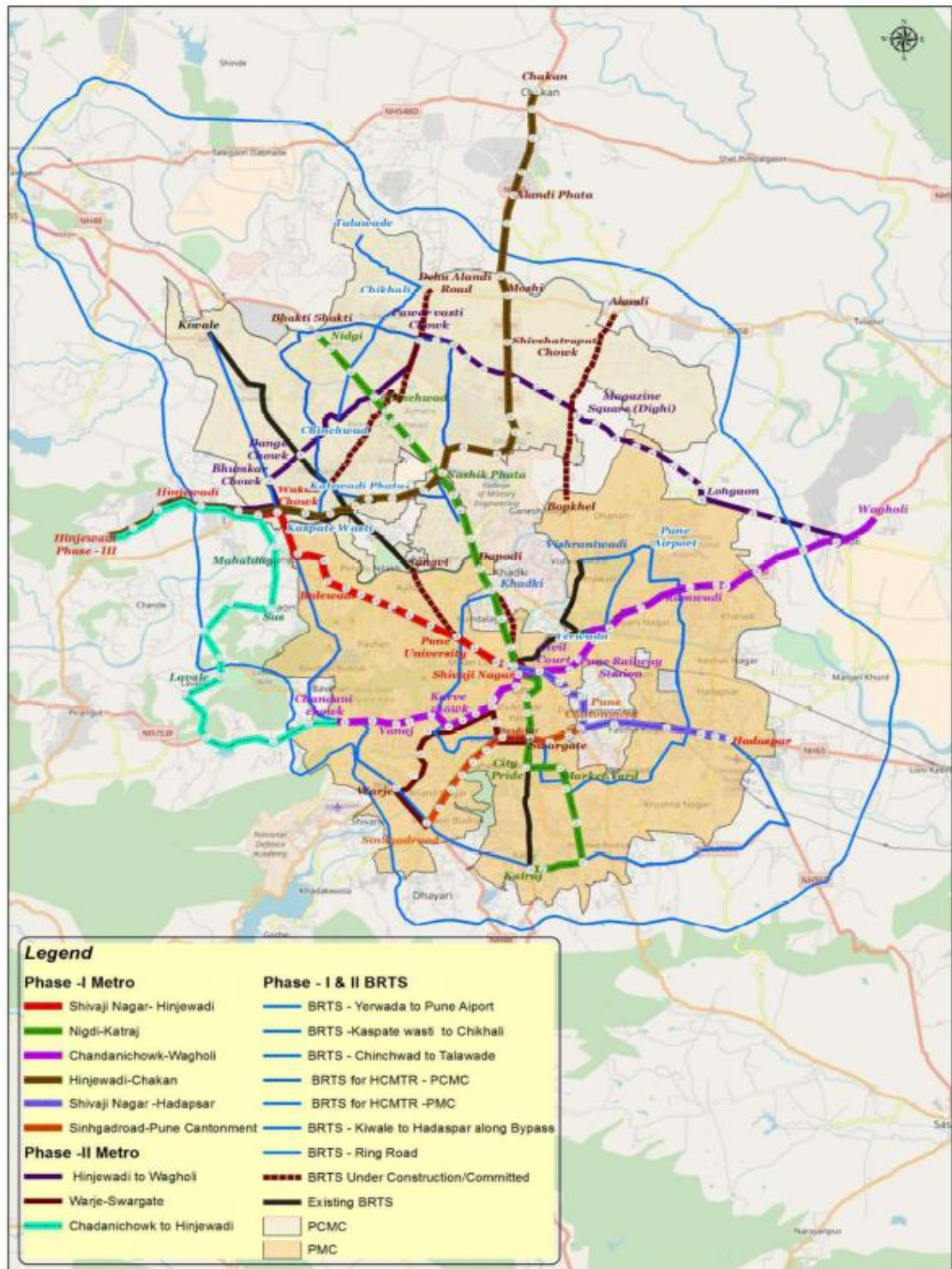
- Decongestion of Existing PMPML Bus Terminus at 12 locations is proposed out of which Hadapsar Bus Stand and Katraj Depot are in the vicinity of the planning area.
- Out of proposed 6 PMPML Bus Terminus, 2 are located at Dhayari and Ambegaon -Narhe.
- Out of 9 proposed Bus Depots 2 Bus Depots are located at Dhayari and Ambegaon-Narhe.
- Shifting of ISBTs from Core city area to outskirts and developing the ISBTs on outskirts as Multi-Modal Hubs for Intra-City Public Transport along with inter-city bus terminals is proposed. Out of 5 locations, 3 proposed locations at Lonikand-Nagar Road, Loni Kalbhor-Solapur Road and Mangadewadi - Satara Road are in the vicinity of the planning area.

9.11.2.3 Railway Station: The redevelopment / Station Area Traffic Improvement Scheme (SATIS) is proposed for all 8 existing railway stations in Pune Metropolitan region, out of which Hadapsar Station is in the vicinity of the planning area. CMP suggests converting Fursungi Railway yard into Passenger Terminal for direct trains from Satara to Nashik.

9.11.2.4 Mass Transport Network: For meeting a future transport demand (for horizon year 2038) a number of alternative mass transport networks or combination thereof are recommended on the corridors based on Peak hour Peak direction traffic, giving priority to at grade transport. Metro, Light Rail Transit, Mono-Rail, BRTS, Organized City Bus Service are modes of Mass Transport being considered as shown in the following map.

Map 9.6 Recommended mass transport corridors by 2038

Comprehensive Mobility Plan for PMC and PCMC in PMR



Source: CMP 2018-2038 Prepared by PMRDA

9.11.2.5 Airport Connectivity: Connectivity proposals for Greenfield Airport proposed at Purandar with projected Airport passenger traffic of 47 million by 2035, have 5 major access roads. Out of these, 'Hadapsar -Saswad road from Dive Ghat' will serve for the airport traffic generated from Hadapsar, Lohgaon, Mundhwa, Undri, in the Planning area. Also Saswad-Bopdev-Pune Road from Bopdev Ghat will serve Ambegaon Bk, Ambegaon Kh, Dhayari in the planning area due to the connectivity.

9.11.2.6 Multi Modal Integration: Seamless transfer from one mode to another is essential to facilitate proper Multi-Modal Integration. 6 Multi-Modal Hubs and 8 Multi Modal transfer Stations with Passenger Amenities, Parking, Commercial Facilities, Feeder Services, Information System about fare, Schedules etc. are proposed in PMR. The Proposed Multi -Modal Hubs at Hadapsar and Wagholi and Multi-Modal transfer Stations at Chandani Chawk, Warje and Wadgaon Bk will cater to the planning area.

9.11.2.7 Road Network in the Planning area: Based on the traffic assessment, major roads to be developed/ strengthened/ upgraded/ interconnected including hierarchical road network, arterial & sub-arterial road construction / widening projects, intersection improvement, ROBs / underpasses, flyovers are identified and planned. Important proposals based on it, for road network development in the planning area of nine villages can be enlisted as below-

Ring Road: Taking into consideration CMP recommendations, cross-section, highway crossings (Grade Separation, Over Bridges/ Underpasses), toll plazas, Provisions for cross traffic and Access to Ring Road are being planned by PMRDA. Due cognizance of these features is being taken while preparing the DP for nine villages.

Road Widening proposals: 14 roads in PMR are identified by CMP for proposed road widening including the following 5 roads passing through and / or having impact on the Planning area, viz.,

(i) Katraj to Mantarwadi via Undri, (ii) Dhayari to Ambegaon-Narhe, (iii) Nagar Road (Kharadi Bypass to Shikrapur), (iv) Sinhagad Road (Veer Baji Pasalkar Chowk to Khadakwasla), and (v) NDA road (Warje flyover to Uttamnagar).

Grade Separator (ROB/RUB) at Level Crossing: 2-lane ROB near Mantarwadi on Saswad road is proposed to be widened to 4-lane. It is included in the planning area.

Undeveloped Roads: Some of the sanctioned roads which are yet to be developed are important from traffic point of view. Charholi to Lohgaon is an important link to connect Pune Municipal limit with that of Pimpri- Chinchwad in the planning area. It needs to be developed on a priority basis.

Development of New Bridges: Out of proposed 5 locations for new bridges in PMC area, Mundhwa-Keshavnagar to Kharadi bridge on Mula-Mutha river is in the planning area.

Metro Corridors: Mobility Corridors maximize throughput of people, focusing on mass transport and non-motorized traffic. Total length of 321.5 km from various parts of Pune Metropolitan Region have been identified as part of Mobility Corridors. 6 of the total 8 metro corridors proposed by CMP are useful for the planning area, as mentioned below-

- i) **Nigdi to Katraj**- The Corridor of 33.63 km of total length will benefit Ambegaon Bk and Ambegaon Kh.
- ii) **Chandani Chawk to Wagholi** – This East to West Corridor of 25.99 km of total length will benefit Lohgaon and Mundhwa
- iii) **Hinjewadi to Hadapsar** –This Corridor is further divided in 2 routes according to PHPDT counts firstly Hinjewadi to Shivajinagar of 23.33 km and then continuing Shivajinagar to Hadapsar for 11.74 km. The corridor will benefit Hadapsar, Mundhwa, Undri.
- iv) **Sinhagad Road to Pune Cantonment** -This Light Rail Metro corridor of 9.08 km length will benefit Dhayari, Ambegaon Bk and Ambegaon Kh.
- v) **Warje to Swargate** - *The Recommended* Light Metro Corridor of 8.87 km length will benefit Shivane and Uttam Nagar.
- vi) **Wagholi -PawarWasti to Hinjewadi**- *The Recommended* Light Metro Corridor of 35.23 km length will benefit Lohgaon.

With Maha-Metro as Planning and Development authority, following Metro routes beneficial to the Planning area, are under development at present, on priority basis: (1) Ramwadi to Wagholi, (2) Hadapsar to Kharadi and (3) Swargate to Hadapsar.

9.11.3 NMT Improvement Plan

Following measures are suggested by CMP for NMT improvement -

9.11.3.1 Proposals for Pedestrian Footpath: Out of 11 roads in the PMC area, identified for Footpath construction, Dhayari Phata road and Mundhwa road are part of nine villages.

9.11.3.2 Pedestrian Grade Separators: Out of 18 locations for proposed Pedestrian Grade Separators in PMC area, Amanora Mall-Magarpatta road, Mundhwa Chowk, and Kharadi Bypass junction on Nagar road are located in the planning area.

9.11.3.3 Pedestrian Crosswalks: Out of 21 locations for proposed Pedestrian Crosswalks in PMC area 1 i.e. Magarpatta main Gate on Magarpatta road located in the planning area.

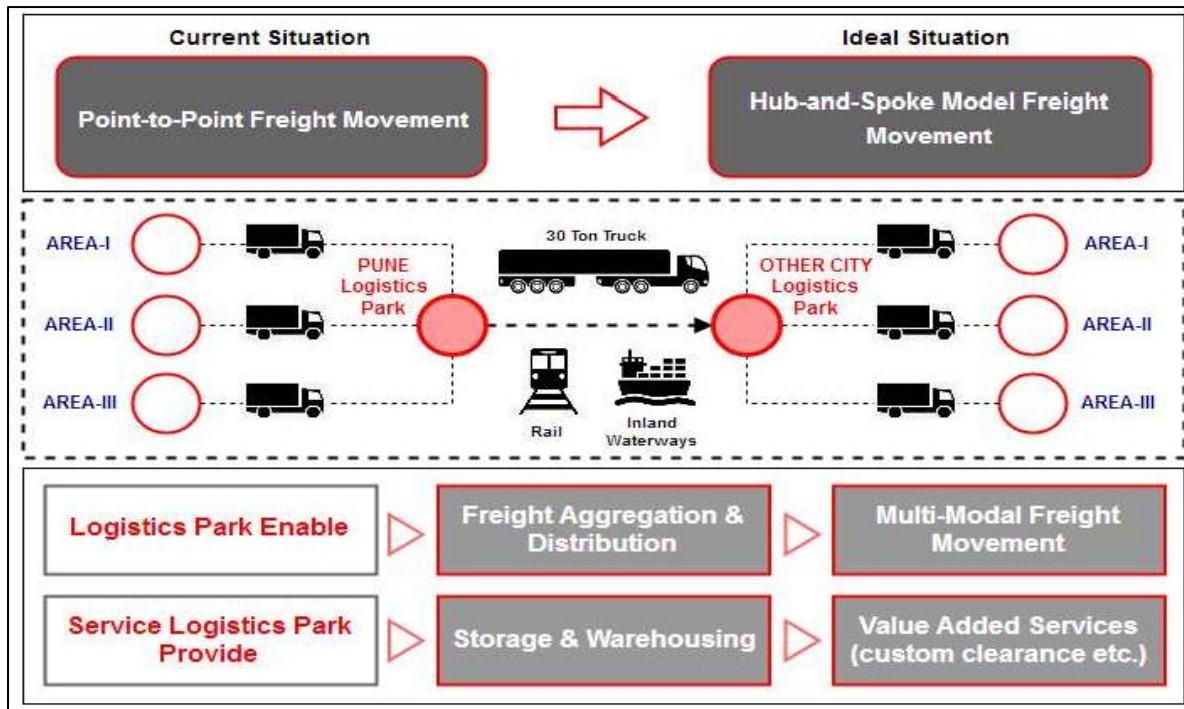
9.11.3.4 Pedestrian Priority Street: The roads on which minimum space is allocated for vehicular movement, parking is discouraged and one- ways are suggested (if an alternative road network is available), can be termed as ‘Pedestrian Priority Streets’. Out of 18 streets proposed as Pedestrian priority streets in the PMC area, Amanora Park Town road, the road connecting old Mundhwa road to Kharadi road, are located in the planning area.

9.11.3.5 Extension of Comprehensive Bicycle Plan 2017 (CBP): Roads are identified in the proposed DP of nine villages to incorporate Bicycle tracks as per the widths of road and current situation. Efforts are being made to provide maximum length of Bicycle tracks in the planning area to promote NMT.

9.11.4 Freight Movement Plan

Freight traffic comprises both local traffic and regional traffic. CMP suggests use of light vehicles within the city, consolidation/ disaggregation of goods at logistic centres having storage/ value added services and connected with regional roads and railway network, located at the outskirts of the city.

Figure 9.2 Concept of Urban Freight Management



Source: CMP 2018-2038 Prepared by PMRDA

In this regard following proposals are given:

- i) Development of Multi-Modal logistic hubs along Ring Road
- ii) Use of existing Truck Terminals inside the city limits for goods storage and loading and unloading of Intra-City light commercial vehicles
- iii) Truck Terminals to be located on the periphery, with application of ITS/ITMS and Surveillance Systems. Nagar road near Wagholi, Western Bypass near Jambhulwadi are among the 6 proposed Truck Terminals which are in vicinity of the planning area
- iv) Development of proposed Talegaon-Daund bypass railway line with one branch line from Shikrapur to Loni Kalbhori / Fursungi, for serving industrial areas such as Talegaon, Chakan, Shikrapur, Ranjangaon, Lonikand
- v) Shifting of Rail Cargo Terminals along the proposed Talegaon - Daund bypass Rail line. CMP observes that Rail terminal at Fursungi has severe access problems and in view of proposed Green-Field Airport to avoid congestion it should be shifted outside the city limits.

9.11.5 Mobility Management Measures

Also referred to as Transportation Demand Management (TDM), Mobility Management involves strategies aimed at using transportation resources more efficiently rather than expanding the transportation system supply. It prioritizes modes such as public transport, non-motorized transport (NMT), and ride-sharing to optimize available road space. The hierarchy of priority typically follows this order: emergency vehicles, essential trips, walking, cycling, public transit, service and freight vehicles, taxis, single-occupancy cars, and automobile parking. Common strategies for Mobility Management include traffic calming, improvement of public transport, parking management, transit-oriented

development (TOD), incentives for public transport users, car sharing, reclaiming streets from encroachments, pedestrianization of roads in congested areas, staggered office and school hours, flexible working hours, and commuter education.

9.11.6 Parking Strategy

On Street Parking Management: Parking strategies aim at managing both on-street and off-street parking while ensuring reasonable access to key attractions, minimizing negative impacts on local businesses, and achieving comprehensive improvements. These strategies should be simple to implement, easy to understand, manageable, and flexible enough to adapt to changing circumstances. On-street parking management may include measures such as:

- a) Restricting parking at intersections (within 50 meters of major junctions)
- b) Regulating parking on narrow streets (streets less than 5.75 meters wide or one-way streets less than 4 meters wide)
- c) Prohibiting parking near pedestrian crossings (within 8 meters)
- d) Allocating priority locations, such as kerb areas reserved for public services (e.g., bus stops)

Off Street Parking Management: Off-street parking management emphasizes shifting demand from on-street to off-street facilities by offering comparatively lower parking charges. Off-street parking should be strategically provided at multi-modal hubs and Inter-State Bus Terminals (ISBTs) to improve accessibility and reduce on-street congestion.

Road Marking, Signage and Street Lighting: Road markings are essential for traffic safety and for ensuring smooth, orderly movement of vehicles along designated paths. Standardized signage, as per the guidelines of IRC Publication 67-2012 “*Code of Practice for Road Signs*”, should be installed at appropriate locations, with special attention near schools. The Comprehensive Mobility Plan (CMP) has identified 95 roads within the Pune Municipal Corporation (PMC) limits for street lighting and footpath improvements. Within the planning area, the key roads include Solapur Road, Saswad Road, NDA Road, Katraj Bypass Road, Magarpatta Road, Sinhgad Road, Mundhwa Road, and Dhayari Phata Road.

Intersection Improvements: Out of 36 junctions identified for upgrades through traffic signals, road markings, signage, geometric redesign, and pedestrian facilities (such as footpaths, railings, and zebra crossings), 5 major junctions fall within the planning area. These are Mantarwadi Junction, Kharadi Bypass Junction, Undri Chowk, Ambegaon Dattanagar Chowk, and Dhayari Umbarya Ganpati Chowk.

Traffic Calming Measures: To enhance pedestrian safety and regulate vehicular speed in areas with high pedestrian activity, traffic calming interventions are recommended. These include speed humps, speed cushions, chokers, raised intersections, roundabouts, medians, raised pedestrian crossings, traffic circles, refuge islands, ramps, bollards, chicanes, and curb extensions.

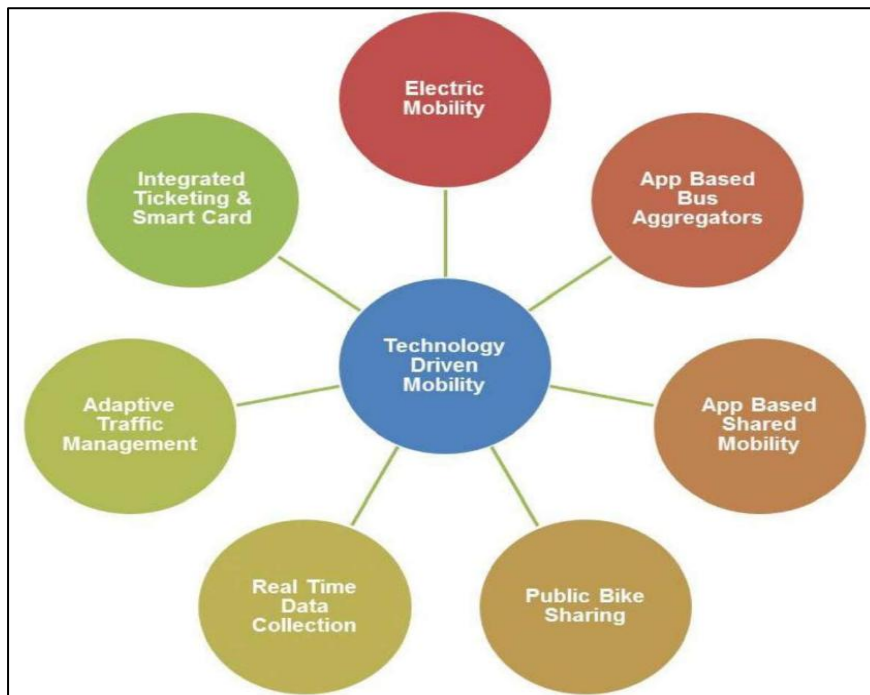
Intermediate Public Transport (IPT) Management: In Pune, IPT primarily comprises auto-rickshaws, shared autos, and taxis. Management strategies include establishing prepaid rickshaw stands, implementing GPS-based metering systems (distance-based fare

collection), banning vehicles older than 15 years, enabling online ride booking, and organizing driver orientation and training programs. Additional measures include banning auto parking near junctions, restricting rickshaw movement along dedicated bus routes, and limiting the issue or renewal of auto permits to low-emission vehicles.

Hawker Management: CMP has identified Green Zone (areas where hawking is allowed at all times), Amber Zone (areas where hawking is allowed during restricted hours), and Red Zone (areas where hawking is not allowed at any time). The zones, along with the identified roads and footpaths, are from the PMC old limits.

Technical Transitions: Recommended technological interventions for Pune include the adoption of electric public transport and IPT vehicles, traffic signal coordination, real-time passenger information systems, promotion of shared mobility, smart travel cards, and advanced electronic systems for traffic management. Key initiatives involve establishing traffic management centers, installing video surveillance cameras, deploying variable message signs, implementing advanced warning systems, and equipping buses with GPS devices.

Figure 9.3 Technological Transitions



9.11.7 Fiscal Measures

Regular fare revision with automatic Fare Revision Component (50% of inflation per year) and strategic fare revision component (based on need of Bus Utility) are necessary. Non-fare box revenue options are to be explored such as Commercial development on PMPML lands, etc. PMPML should benchmark its services with other efficiently run bus services in India in terms of operational cost, efficiency, last mile connectivity, frequency, facilities etc. Involving the private sector in bus operations on certain routes would save initial investments and bring in efficiency and new technologies.

9.12 Impact Assessment

CMP 2018 has provided detailed preliminary social and environmental impact assessment, based on site reconnaissance, of the proposals put forward by it.

9.12.1 Social impacts

- Traffic calming measures in core area; Better pedestrian facilities encouraging more walk trips; provision of cycle tracks, PBS will promote use of NMT
- Increased use of NMT and Public Transport modes will reduce use of private vehicles
- Improvements of safety, reduction in accidents due to better traffic management.
- Optimal and equitable distribution of available road space to all modes with better integration among the various modes by developing multimodal facilities
- Improvement of traffic speed and reduction of delays and travel times
- Promotion of economic activities due to improved accessibility and mobility
- Economic savings to society due to improved mobility
- Improvement in the health conditions of people due to reduced pollution.
- Use of ITS will help in optimizing the available transport infrastructure.

9.12.2 Environmental Impacts

- Increased use of public transport and NMT modes will reduce air & noise pollution.
- Enhanced environment quality and NMT will promote tourism development.
- Implementation of traffic signals would also aid in better management of traffic
- Reduction in urban congestion due to banned movement of freight in the day time
- Improved air quality due to shifting of goods activities such as truck/ railway terminals/ warehouses from the city
- Relocation of ISBTs (Inter State Bus Terminal) to outskirts will reduce congestion and pollution in core areas

9.13 Mitigative Measures based on Impact Assessment As per CMP 2018

- i) Plantation & Landscaping / greening of the areas adjacent to roads to reduce pollution
- ii) Removing traffic bottlenecks and congestion by improving road geometry and by widening the roads, Removal of encroachments to smoothen traffic flow, traffic signal optimization, provision of signage etc.
- iii) Alternative routes to main corridors in congested settlements.
- iv) Keeping Asphalt plants/ crushers and batching plants at least 1 km in the downwind direction from human settlement, Reducing emissions from construction machinery.
- v) Procurement of low emission vehicle fleets like electric vehicles, Linkage of all PUC centres for better data capture.
- vi) Fiscal incentives for early replacement of old vehicles and Fiscal incentives/ subsidies for non polluting vehicles. Installation of more air quality monitoring stations, decimate the information to improve the awareness of the general public.
- vii) Use of alternative fuels such as CNG, LNG, Bio-diesel and electric vehicles.

CHAPTER 10 : ENVIRONMENT AND DISASTER MANAGEMENT

Introduction

Environment can be defined as a sum of all the living and non-living elements and their interrelated effects & influence on human life. It includes natural elements essential for human life along with surrounding geology & biodiversity and features like Socio-economic & Cultural factors like human growth, inheritance and communal life. Over consumption of natural resources results in environmental degradation, leading to increased risk from disasters and natural hazards can further degrade the environment. Thus, Environmental degradation is both a driver and consequence of disasters, reducing the capacity of the environment to meet social and ecological needs. As the city develops and expands, growth in population, urban sprawl, industrial growth put stress on the environment.

It is crucial to study the status of the city-environment, while formulating the future growth. By environmental studies, it is possible to collect data on the environment, to categorize the causes and consequences of environmental disparities, to act on action plans for the required balance of Environment and Disaster Management. This chapter focuses on the status, issues and their effects on the environment of the city including the planning area. Abundant water and ambient air quality have been main drivers of development of Pune. Pune's environment is discussed in the following paragraphs

10.1 Natural Features of the Environment

Natural environment consists of all landforms and other resources that are made available by nature. Some of them are explained in detail as below,

10.1.1 Hills and Hill-slopes

Pune is located in a saucer shaped basin surrounded by hills, except on the North-East of the city. The Mutha river flows at the lowest altitude of @ R. L. 530 m, while the highest point is in Yewalewadi (R.L. 1014 m). Among the newly merged nine villages; Lohgaon, Ambegaon Khurd, Dhayari and Shivane have partly hilly terrain, while remaining villages have plains mostly.

10.1.2 Water Bodies

Water body is any significant accumulation of water or streams on the surface of earth, which includes lakes, ponds, wetlands, or puddles, rivers, canals, streams and nallas.

1. Rivers: Rivers Mula and Mutha flowing through the city, are prominent features. Mutha River originating in the Western Ghat flows from west to east through the city, while Mula River enters the city from west near Balewadi and meets Mutha near Sangamwadi. The Mula-Mutha river after the confluence flows in the South- East direction.

In the Planning area, Shivane and Mundhwa are on the banks of Mutha and Mula- Mutha river respectively. River Indrayani touches Lohgaon at its North East boundary. Several

nallas flow through the city and meet these rivers. Total length of rivers in the city is 44 km (Mula 22.2 km, Mutha 10.4 km and Mula-Mutha 11.8 km) with widths 80-250 m.

Table 10.1 Details of nalabanks in the planning area

Sr. No.	Village	Length of Bank in km	River	% of Total Length
1.	Shivane	2.989	Mutha	28.74 %
2.	Mundhwa	3.370	Mula - Mutha	28.55 %
3.	Lohgaon	0.318	Indrayani	Out of PMC limit

Pune's Rivers have degraded over the time. Growing urban activities, pollutants, encroachment, dumping of construction debris and waste has left them in a pathetic state.

2. Nallas: Ambil Odha, Nagazari nalla, Bhairoba nala are some major nallas in Pune. Planning area has a number of remarkable nallas as described in the following table:

Table 10.2 Details of riverbanks in the planning area

Sr. No	Village	No. of Nalla	Total Length (m)	Length of nallas (m) having width greater than or equal to 10 m
1 & 2	Shivane and Shivane-Uttam Nagar	6	4806	Nil
3	Dhayari	4	14839	771
4	Ambegaon Kh	7	6738	893
5	Ambegaon Bk	2	4572	601
6	Undri	4	6576	875
7	Hadapsar- Sade Satra Nali	3	5455	3239
8	Mundhwa- Keshav Nagar	8	3937	1484
9	Lohgaon	36	47280	7919

(Source-StormWater Master Plan for Yewalewadi and Newly Merged 9 Villages- December 2019, PMC & Physical Survey done by Monarch Surveyors in 2018)

Due to changed patterns of rains, increase in paved surface and encroachments on natural streams, flooding of nallas have become more intense and frequent in recent years. The measures suggested for nallas in the Storm- water Drainage Master Plan 2007 covering the erstwhile city of 243.84 sq.km (23 basins), are under implementation in the city. The master plan helps PMC to find out encroached natural streams, to protect them and to avoid flooding in the city due to intensive rainfall through proposed storm water drainage system.

Map 10.1 Storm water basin



Primove Infrastructure Development Consultants Pvt Ltd has prepared Stormwater Master Plan 2019 after conducting a survey of the planning area of nine villages measuring 56.16 sq.km. and village Yeolewadi. Brief details of the Master Plan 2019 are as under-

- Base Map is prepared using relevant villages maps, DP, RP maps, topo-sheets, available satellite images and Existing features on ground. Catchment areas of main nallas and their tributaries are marked with the help of Reconnaissance and Topographical survey.
- Historical rainfall data from the nearest rain-gauge stations are collected.
- The adequacy analysis of existing drains and current carrying capacity of natural streams in the planning area is evaluated and proposals are made accordingly
- The urban Run-off is computed by using Rational Method as recommended in CPHEEO (Central Public Health & Environmental Engineering Organisation) manual. Rainfall intensity for different times is worked out as per step method Intensity - Duration - Frequency (IDF) curve for 2 year return period(as per Manual on Sewerage and Sewage Treatment), considering the nature of Development in the planning area. The hydraulic capacity of the drain is computed by using Manning's formula. Minimum velocity in the drain is considered 0.90 m/sec and maximum velocity for RCC or masonry drain with natural bed up to 3 m/sec. Natural streams are designed for natural slopes.
- Proposed Stormwater network is prepared on a GIS map with attributes like estimated runoff, proposed size of drains etc. Proposals for stormwater drainage components i.e. road drains, nalla improvements, flooding spot and culverts etc.

with recommendations and designs given in two sections i.e. for Nallas and for Road side (stormwater) drains.

Table 10.3 Nallas and culverts in planning area

Sr No	Village	Total Length (km)	Minimum Section (m)	Maximum Section (m)	Proposed Number of Culverts (Additional)
1, 2	Shivane and Shivane-U'nagar	4.82	3.00 x 1.50	3.20 x 3.00	06
3	Dhayari	14.84	2.00 x 1.00	7.00 x 1.50	09
4	Ambegaon kh	6.98	2.00 x 1.00	14.00 x 3.00	10
5	Ambegaon bk	4.57	2.00 x 1.50	20.00 x 2.50	03
6	Undri	6.58	2.00 x 1.00	13.00 x 2.30	08
7	Hadapsar- Sade Satara nali	5.13	4.00 x 2.00	29.00 x 2.20	01+4 Aqueducts
8	Mundhwa- Keshav Nagar	6.03	2.00 x 1.00	32.00 x 2.50	04
9	Lohgaon	47.28	2.00 x 1.00	18.00 x 1.80	10
	Total	96.23			55

(Source-StormWater Master Plan for Yewalewadi and Newly Merged 9 Villages-Nalla & Culvert design report, December 2019, PMC)

Table 10.4 Road side drain (pipe & box drains) summary of planning area

Sr. No	Village	Total Length (m)	Circle Drain (m)	Box Drain (m)
1&2	Shivane and Shivane-uttamnagar	27,986	27,091	895
3	Dhayari	47,505	42,827	4,678
4	Ambegaon kh	28,634	28,634	-
5	Ambegaon bk	20,938	20,035	903
6	Undri	42,719	36,658	6,061
7	Hadapsar- Sadesatara nali	23,506	16,645	6,861
8	Mundhwa- Keshavnagar	34,228	26,656	7,571
9	Lohgaon	96,827	74,919	21,908
	Total	3,22,343	2,93,465	48,877

(Source-Stormwater Master Plan for Yewalewadi and Newly Merged 9 Villages, December 2019, PMC)

3. Lakes: Katraj Lake, Pashan Lake, Lakaki Lake, Sarasbaug Lake are major lakes in the city. In the Planning area Jambhulwadi Lake, Haran Tale, Village Lake of Dhayari,

Percolation Tank at Undri are major lakes. Table no 10.3 gives the details of lakes in the Planning Area.

Table 10.5 Lakes in the planning area

Sr No	Village	Location	Description	Area in Ha
1.	Ambegaon kh	Southern Part of the village along NH 48	Jambhulwadi lake	31.21
2.	Lohgaon	Central Part of included village area	Harantale	24.58
3.		Sr. No. 12	Uneven terrain	1.59
4.	Dhayari	Sr. No. 108 (110,79)	Gaon tale	0.72
5.	Undri	Parts of Sr. No. 33, 34, 35, 36, 40	Percolation Tank	6.22

10.1.3 Groundwater

Groundwater is the water present beneath Earth's surface in rock and soil pore spaces, in the fractures of rock formations and aquifers (saturated subsurface spaces). Groundwater discharge is movement of groundwater from subsurface to surface, as a natural discharge into lakes, streams, springs, while a natural recharge area is an area facilitating maximum contribution of groundwater recharge in to underlying aquifer.

India is the largest user of groundwater in the world, major share being used for agriculture. Groundwater over-abstraction and contamination have led to vulnerability of resources and populations across large swaths of India. Groundwater Governance is demand of the hour, which is mainly governance of aquifers. Groundwater governance is sustainable only if protection of moderation of their use aquifers is forged. Pune's hydrogeology and urban groundwater footprint requires a focused approach for Groundwater Management. PMC has adopted a path-breaking approach by setting up Pune Ground Water Cell (PGWC) and advisory committees for Groundwater governance. ACWADAM (An NGO) has undertaken geological mapping, water level monitoring of Pune aquifers. Important sites in the planning area for Groundwater Governance, as suggested by them -

- Jambhulwadi lake at Ambegaon Kh (Groundwater Discharge site),
- Harantale & Lohgaon Tank at Lohgaon (GW Recharge sites),
- Gaon tale at Dhayari (GW Recharge),
- Percolation Tanks at Undri (GW Recharge sites),
- APMC premises at Shivane Uttamnagar (GW Recharge site).

Policies and Action Plan are formulated for preservation and replenishment of these sites. Execution will be under 'AMRUT-2' with the aid of NIUA (National Institute of Urban Affairs) under the Ministry of Housing and Urban Affairs (MoHUA), GOI.

Details of 3 sites from the planning area out of the first set of 5 sites in Pune, identified for "Shallow Aquifer Management" through implementation of Aquifer Recharge structures, under AMRUT 2.0, are as follows

Table 10.6 Sites related to “Shallow Aquifer Management” in the planning area

Sr No	Location	Latitude	Longitude	Elevation m	Hydro geological location	Interventions
1.	Haran tale Lake, Lohgaon	18.6061	73.94185	588	Recharge area	Watershed restoration CCPT, Desilting, Large Dia Dug well
2.	Dhayari village lake	18.4375	73.8125	597	Recharge area	Large Diameter Dug well, stone pitching, Roof top rain harvesting
3.	APMC Market, Shivane (U' Nagar)	18.4621	73.7723	568	Recharge area	Recharge shaft, Rooftop RWH

10.1.4 Geology

Pune region is surrounded by Plains called ‘Desh’, 15-30 km belt known as ‘Maval’ lies towards the west of Desh and 15 to 30 km wide range of Sahyadri Mountains, lies towards the West of Maval. Pune City sits on the Deccan plateau. Around 95% area of Pune district is made of 7-45 m thick basalt layers (vesicular basalt at the top and massive basalt at the bottom). Pune City and Planning area mostly lies in a Moderately Sloping Zone. Soil in the area is deep, moderately drained and strongly calcareous, with moderate erosion.

10.1.5 Biodiversity

Biodiversity refers to coexistence of living things, including plants, bacteria, animals and humans. Biodiversity largely depends on the climate, amount of rain, temperature, altitude, properties of the terrain and existence of other living beings in the area. India has prominent regions for Biodiversity like The Silent Valley in Kerala, North-East India and Western Ghats with a wide variety of plants, many species of animals and birds.

Biodiversity is depleting at a drastic rate due to destruction and fragmentation of habitat, over exploitation, harvest, various forms of pollution and climate change. Convention on Biological Diversity (CBD), Wild Life Protection Act, etc. are part of efforts for conservation of biodiversity. “Biological Diversity Act, 2002” and “Maharashtra State Biological Diversity Rules 2008” ensure conservation of biological diversity, sustainable use of its components and fair usage of its resources.

a. Sustainable development and Biodiversity: Sustainable development is defined as development that meets present needs without compromising ability of future generations to meet their own needs. 193 countries of the UN have ratified 17 Sustainable Development Goals and 169 associated targets addressing global challenges concerning poverty, inequality, global climate change, environmental degradation, peace and justice. Biodiversity is critical to all or any of them. To attain sustainable development technology, natural resources and socio-economic dimensions must work in a symbiotic, complementary manner. India has entrusted NITI Aayog responsibility for coordination of sustainable development goals set by the Ministry of Statistics and Program Implementation, GOI.

b. Biodiversity of Pune and its Status: Pune region has Steep habitat gradient where habitats change rapidly within short distances showing significant natural and cultivated biodiversity, mainly Terrestrial Ecosystems and Aquatic Ecosystems.

Pune urban area has biological niches at Empress Botanical Garden flourishing more than 2000 species over 39 acres, Experimental Botanical Garden including Herbarium species and at Savitribai Phule Pune University for rarest and endangered plants on an area of 5 acres. Besides, institutes in Pune like Fergusson college, Law College, Bhandarkar Institute, BMCC, NDA, Botanical Survey of India, Agharkar Research Institute are helping to maintain the Terrestrial Ecosystems. There are many rare species of trees in the city.

Aquatic Ecosystems are cultivated at rivers (Mula, Mutha, Mula-Mutha and Ram River), streams (Ambil Odha, Nagzari, Bhairoba nalla) and lakes (Pashan lake, Jambhulwadi lake, Katraj lake). Worldwide migratory birds come to the area of ARAI, Kavadi Pat, Sinhgad and Pashan lake in winter. Significant sites of Biodiversity in the planning area are as follows:

Table 10.7 Biodiversity & ecosystem in the planning area

Sr. No.	Village	Feature	Area in Ha	Type of Ecosystem
1.	Dhayari	Hilltop	252.03	Terrestrial
		Lake	0.72	Aquatic
2.	Ambegaon	Hilltop	219.06	Terrestrial
	Ambegaon	Lake	31.41	Aquatic
3.	Lohgaon	Hilltop	30.83	Terrestrial
		Tank	10.39	Aquatic
		Lake	1.59	Aquatic
4.	Undri	Lake	3.51	Aquatic

The number of species of Flora and Fauna in and around the Pune city are listed below

Table 10.8 Types of flora and fauna around Pune city

Flora			Fauna		
Sr No	Types	Number of Species	Sr No	Types	Number of Species
(a)	Trees	645	(a)	Mammals	27
(b)	Shrubs	25	(b)	Reptiles	25
(c)	Herbs	144	(c)	Birds	194
(d)	Palms	35	(d)	Butterflies	149
(e)	Gymnosperms	15	(e)	Insects	137
(f)	Creepers and Climbers	28	(f)	Fish	135
(g)	Bryophytes & Algae	6	(g)	Snails & Crabs	25
(h)	Fungus	53	(h)	Frogs	18
			(i)	Tortoise	2

(Source: Environmental Status Report, PMC: 2021-22)

c. Strategies and Action Plans for Biodiversity Conservation: Pune city has a total 210 gardens and parks contributing to a total green area of about 489 acres (Kamala Nehru Park, Sambhaji Park, Shahu Udyan, Peshwe Park, Saras Baug, Bund Garden, P. L. Deshpande Udyan (replica of the Korakuen Garden in Okayama, Japan), to name a few). Hanuman hill, Vetal hill, and Taljai hills are nature reserves in the city.

Rajiv Gandhi zoological park and wildlife research center, Katraj, (area 130 acres), has 400 animals (67 species) inhabited by Ex-Situ method. It also has an 'Animal Orphanage' for treating injured animals, birds and reptiles before being released back into nature.

Ganeshkhind Udyan (under Mahatma Phule Agricultural University) over the area measuring about 33.01 Ha has been declared as Biodiversity Heritage site in Aug 2020.

d. Plantation in the city: Tree Census 2022 using GIS & GPS counted 51,37,632 trees in Pune exhibiting 75 families of trees including 124 rare species. It shows maximum numbers of trees in Parvati, Katraj and Pachgaon kuran area, whereas minimum trees in the core of the city. Green cover in the planning area is diminishing fast with haphazard development. Measures for conservation and promotion of biodiversity in Pune city are proposed to be carried forward in the planning area as well.

e. Rules / Regulations/ Guidelines regarding tree plantation: Maharashtra Government has published guidelines for the plantation through GR no 43 dated 14/12/2009 as follows:

Table 10.9 Government norms for number of trees to be planted

Sr. No.	Location for Plantation	Requirement	
		Road Width	Plants
1.	Road Side	24 m & More	1/10 m
		12 -24 m	1/10m
		6-12 m	5/20m
2.	Parks, Beaches, Hill Slope, Green Spaces, Green Belt, River Banks, Wetlands Shore	1/10 sq.m	
3.	Garden	1/20 sq.m	
4.	Layout Open Space	1/50 sq.m	
5.	Sports Auditorium, Mini Sports Auditorium Playground, Children Play Ground, Open Spaces in Development Plan	1/100 sq.m	
6.	Central Govt. /State Govt. /Semi Govt./ Corporate offices	1/100 sq.m	

(Source: Department of Urban Development, Maharashtra State Govt. Resolution No.43, Dated 14/12/2009)

Norms imposed by UDCPR-2020 for tree plantation in different land uses and development.

Table 10.10 UDCPR 2020 norms for number of trees to be planted

Sr No	Land Use / Development	Regulation No	Plantation Criteria
1.	Amusement Park/ Educational campus in Agricultural Zone	4.11	250/ Ha
2.	Other permissible uses in Agricultural Zone	4.11	100/ Ha
3.	Afforestation Zone	4.16	250/ Ha
4.	Green Belt	6.5	100/ Ha
5.	Biotechnology Park in No Development Zone	7.9.3	500/ Ha
6.	Integrated Township Project (ITP)	14.1.1.12	150/ Ha
7.	Integrated Information Technology Township Project (IITP) in Agricultural/ green/ No Development zone	14.10.5	150/Ha
8.	Integrated Information Technology Township Project (IITP) in zones other than Agricultural/ green/ No Development zone	14.10.5	100/Ha

10.2 Environmental Status, Strategies and Action Plans by PMC

It is mandatory for the Municipal Corporations to prepare and publish an 'Environment Status Report' every year, under the Section 67-A of MMC Act 1949. "Environment Status Report 2022-23" for Pune is prepared, as per guidelines of the MPCB. Status of environmental conditions gives information for identification of environmentally critical areas and offers inputs in development planning. It emphasises the need of restoring natural resources and environmental protection. Statistics depicting the status of environment quality in different parts of the city, provides information about overall environment quality of the city, which applies well for the nine villages. The ESR 2022-23 of PMC was widely referred to, while preparing the DP for newly merged nine villages.

Element Wise status of environment in Pune city and area and also strategies/ action plans by PMC for Environmental protection and enhancement are described as below-

10.2.1 Air Quality

Types and amounts of pollutants have a large impact on air quality

a. Status of Air Quality: Two meteorological observatories in Pune district (Pune city and Baramati), record climatological statistics. In addition, air quality inspection centres at Pashan, Shivajinagar, Pune Airport, Katraj, Hadapsar, Manjari and Girinagar operate under 'SAFAR-Pune'(System of Air Quality & Weather Forecasting and Research), which is a national initiative of Ministry of Earth Sciences-MoES, GOI, system developed by Indian Institute of Tropical Meteorology (operationalized by IMD for PMC).

Comparison of air quality of Pune with National Ambient Air Quality Standards (NAAQS) given by CPCB, for 3 years gives fair idea about the Air Quality status in Pune.

Table 10.11 NAAQS & Pune's air quality (Unit of Measurement for pollutants is $\mu\text{g}/\text{m}^3$)

Sr No	Pollutant	Source	NAAQS Standard (Annual)		Before Lock-down		During Lockdown		After Lock down	
			Commercial Residential and other	Sensitive areas	April 2019	May 2019	April 2020	May 2020	2021	2022
1	PM ₁₀ Particulate Matter	Dust (from construction, landfills, industrial sources, wildfires, agriculture, bush / waste burning, wind-blown), pollen and bacteria.	60	60	79.63	75.3	49.64	47.9	85.30	86.60
2	PM _{2.5}	Fireplaces, car engines, and coal- or natural gas-fired power plants	40	40	39.28	35.4	29.24	30.9	55.24	46.40
3	NO ₂ Nitrogen Dioxide	Emissions from cars, trucks and buses, power plants, and off-road equipment	40	30	21.68	19.0	6.38	9.29	41	222.1
4	CO Carbon Monoxide	Fumes produced any time you burn fuel in cars or trucks, small engines, stoves, lanterns, grills, fireplaces, gas ranges	2	2	0.92	0.91	0.72	0.78	1.43	292.9

5	SO ₂ Sulphur Dioxide	Burning of fossil fuels- coal, oil, and diesel or other materials that contain sulfur. Sources include power plants, metals processing and smelting facilities, and vehicles.	50	20	11.72	18.5	8.66	8.48	22	191.5
6	O ₃ Ozone	Cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight.	50	50	Data Not Available	Data Not Available	Data Not Available	41.33	Data Not Available	Data Not Available

(Source: NAAQS 2009 and Environmental Status Report 2021-2022 and 2022-2023, PMC)

In the lockdown period of Covid-19 Pandemic, level of air pollution was reduced due to negligible road traffic, industrial, commercial activities. The concentration of PM10 is less during Monsoon while highest in December. PM 2.5 levels were within the standards till year 2020, while it has exceeded the limit in the following years i.e. 2021 & 2022.

b. Strategies and Action Plans to control Air Pollution:

- PMC has Established Continuous Ambient Air Quality Monitoring Stations (CAAQMS) at the crucial locations in the City for checking and analyzing the quality of air. Under the Clean Air Project in India (CAP), the Ministry of Environment, Forests and Climate Change (MoFECCH) and Swiss Agency for Development and Cooperation (SDC) are conducting a source adoption study in the city, on the problem of air Pollution.
- Air Pollution Control units are installed at various 23 places over the city and are being installed at Cremation grounds at Bavdhan, Kondhwa and Sangamwadi.
- PMC has an Agreement with IGBC and GRIHA on Green Building Rating which attracts many incentives to promote eco-friendly building construction,
- Control of Vehicular Emission through using alternative Fuels like CNG in vehicles- PMPML runs about 90% of the buses on CNG along with 458 electrical buses.
- The Ministry of Road Transport & Highways,GOI dashboard shows that out of a total 38,17,540 vehicles in the city about 3,25,782 were new vehicles registered during April 2023 to May and 37,181 were Electric Vehicles. Also, 160988 vehicles were conforming to BS-VI (up to year 2022), which emit 5 times lower Sulphur than Diesel operated vehicles and 3 times lower than Petrol operated vehicles.
- Pune is the first city to establish 'Electric Vehicle Cell' as an initiative for electric mobility. Under India's 'Electric Vehicle Nation 2030' scheme, 500 EV charging stations are planned. One EV charging station is operational at Bhekrai Nagar Bus Depot, as a pilot project.
- Metro Project is expected to reduce air pollution by reducing the vehicular traffic.

10.2.2 Water Quality

Pollutants in water disrupt entire ecosystems and are extremely harmful to the health. The largest source of water pollution in India is untreated sewage. Water demand of Pune City is catered through 4 dams having cumulative capacity of about 38.96 TMC (with 31.72 TMC usable water). Additionally, Bhama-Askhed Water Supply Scheme, designed for water supply of 200 MLD is supplying 2.672 TMC to the Eastern part of Pune City. Water from the Dams is treated by PMC at 7 Treatment Plants before supplying to the city. Most of the newly merged nine villages from the Planning Area have been receiving water from PMC through the respective Gram Panchayats before merger.

a. Status of Water Quality: Water quality is measured by concentration of dissolved oxygen, bacteria levels, salinity, amount of material suspended in the water (turbidity), etc. Dissolved Oxygen (DO) refers to the level of free, non-compound oxygen present in water and influences the organisms living in water. Biochemical Oxygen Demand (BOD) measures the amount of oxygen consumed by microorganisms for the process of decomposition of organic matter in the water bodies. It indicates the amount of organic pollution present in an aquatic ecosystem. Chemical Oxygen Demand (COD) is the amount of dissolved oxygen that must be used for oxidizing chemical organic materials & effluents.

The following table throws light on water pollution in Pune city, by comparing level of various indicators as compared with CPCB standards.

Table 10.12 Status of water pollution in Pune, 2022-2023

Water Body	Name	Dissolve Oxygen (DO) (mg/lit)		Biochemical Oxygen Demand (BOD) (mg/lit)		Chemical Oxygen Demand (COD) (mg/lit)	
		CPCB limit	Observation	CPCB limit	Observation	CPCB limit	Observation
Lake	Pashan	2	4.6	30	24.56	150	55.67
	Katraj	2	4.86	30	20.12	150	41.13
Nalla	Bhairoba	2	2.98	30	83.45	150	198.23
	Nagzari	2	3.21	30	81.23	150	176.43
	Ambil	2	2.75	30	82.23	150	175.34
River	Mutha	2	Max- 3.76 Min- 2.34	30	Max- 54.23 Min- 45.12	150	Max- 136.34 Min- 99.34
	Mula - Mutha	2	Max- 4.32 Min -3.98	30	Max- 43.38 Min- 35.43	150	Max- 97.43 Min- 82.34

(Source: Environment Status Report 2022-2023 PMC)

Nallas in Pune city have satisfactory DO level, whereas in lakes and rivers it is on a higher level. BOD in Rivers is more than the CPCB limits. COD in lakes and rivers has increased than the previous year, while decreased in Bhairoba nala and Ambil Odha.

b. Strategies and Action Plans for Water Management of Pune City: Water from the Dams is treated at the following water purification centers before supplying to the city.

Table 10.13 Details of water treatment plants

Water Treatment Plant	Location	Capacity (MLD)	Type of Treatment
Parvati	Sinhgad Road	450	Conventional
		500	Non- Conventional
Cantonment (Entire)	Cantonment	100	Conventional
Wadgaon	Sinhgad Road	250	Conventional
Warje	Warje	382	Conventional
Old Holkar	Holkar Bridge	20	Conventional
New Holkar	Holkar Bridge	40	Conventional
Wagholi	Wagholi	26	-
	Total	1768	

- PMC is looking for the additional sources of water while planning for new treatment plants, augmentation of existing water works and reserving the sites for the same.
- 82 storage tanks are being constructed in the city to maximize the water storage capacity. Also, more sites are being identified across the city.
- Installation of water supply distribution system (1800 km length) with 318847 Automatic Meter Reading (AMR) machines, is in process to supply water 24x7.

10.2.3 Sewerage System and Sanitation

Sewage can contaminate water through various ways like leaking/flooding of sewers, aging sewers failing under stress, rising groundwater levels in areas with cesspools and septic tanks, infrastructure failures due to growing populations and climate change. Large amount of sewage generated in the city is managed by PMC, including transportation and treatment and to reuse or discharge effluent back into the water cycle.

a. Status of Sewerage System: Pune generates around 883 MLD sewage per day including 139 MLD which is generated from the newly merged nine villages. A total of 477 MLD wastewater is treated at 10 STPs with a total capacity of 567 MLD. Besides, privately run STPs in the city are adding to the sewage treatment capacity, as many ITPs and large Townships are coming up with STPs. (7 private STPs were treating 32 MLD sewage till 2022). As per household survey by GIPE, about 90% of the planning area is covered by a closed drainage system while septic tanks cater to the rest of the area.

b. Strategies and Action Plans for Sewerage Management:

Total 11 STPs of total capacity 396 MLD are planned to be constructed under National River Conservation Scheme. Following is the list of proposed STPs in the newly merged area.

Table 10.14 Proposed STPs in the planning area

Villages	Proposed STP's in the planning area		
	Total Capacity in MLD for year 2032	Total Capacity in MLD for year 2047	Land required in (Ha)
Ambegaon Budruk	21.00	27.00	1.20
Dhayari	16.00	21.00	1.00
Lohgaon (North- East side)	10.00	13.50	0.75
Lohgaon(South- East side)	8.50	11.00	0.75
Mundhwa	85.40	3.50	11.10

Source- Stormwater Master Plan, Drainage Department, PMC

Additionally, the proposed STP with 143.5 MLD capacity at Manjari Bk for estimated sewage generation in the year 2047, is adjacent to the planning area.

- The National Directorate of River Conservation is planning to avail (JICA) funds for treatment of wastewater by 2027. The project costing Rs. 990.26 crores, includes erection of community toilet blocks, Coordination of GIS & SCADA system, etc.
- Large diameter trunk lines are being developed in various Drainage Districts (Zones) of the city, according to the Sewerage Master Plan.
- PMC has adopted an innovative technique of Gamma Radiation treatment on the sludge (by 500 kCi Cobalt-60) at STPs, to destroy harmful pathogens & to add microorganisms in it, so that it can be used as organic fertilizer to increase soil fertility.
- Parameters given by MPCB are being followed at STPs for qualitative treatment process.

10.2.4 River Rejuvenation

The growing urban activities have left the water bodies in a vulnerable state. Rivers presently face growing levels of pollutants and rapid degradation. "Pune River Rejuvenation Project" aims at transforming Mula, Mutha and Mula-Mutha.

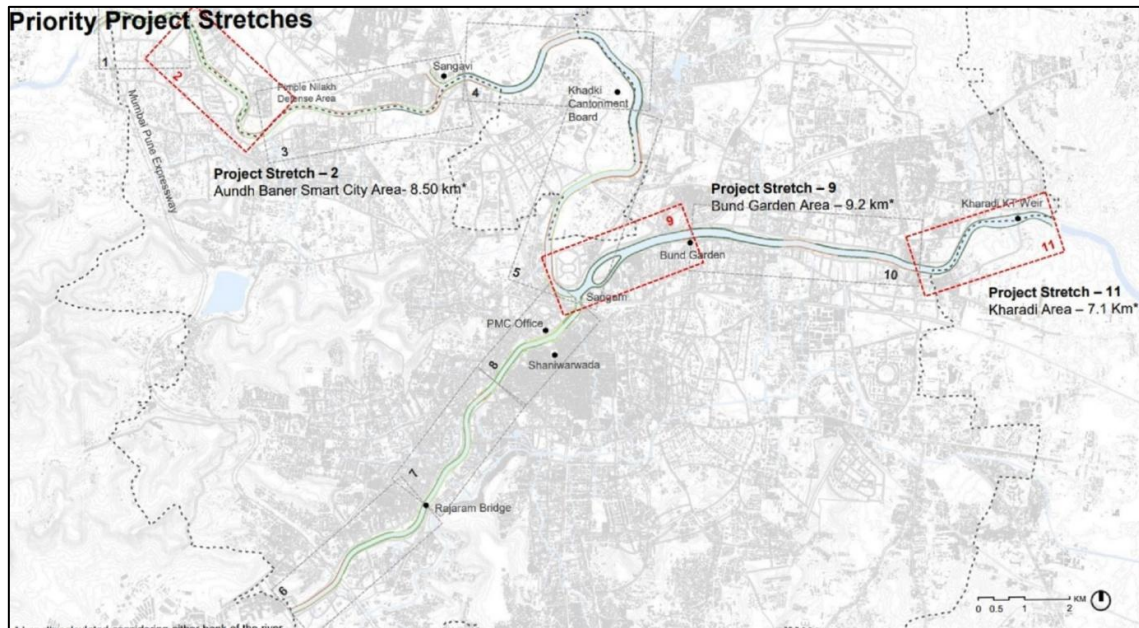
Figure 10.1 Satellite image of rivers flowing through the city`



Status of River Pollution: In most of the city area, sewerage network is laid within the channels of water courses, which is seriously affecting the natural water course drainage pattern. As per CPCB Mula, Mutha & Mula- Mutha are polluted rivers and the downstream side of the city is suffering from highly polluted discharges. BOD level on the upstream side is 2-5 mg/l, while 50 mg/l on the downstream side; which is having an impact on Bhīma River and Ujani dam. There are more than 50 outfalls on the Mula, Mutha & Mula-Mutha River. Because of insufficient treatment facilities and inadequate drainage network, untreated drainage is let into the rivers, in the newly developed suburbs of the city. River rejuvenation is the need of the hour for pollution-free rivers.

Strategies and Action Plans (River Rejuvenation Project): Proposal of River Rejuvenation for 44 km length of rivers Mula, Mutha and Mula-Mutha under jurisdiction of PMC is prepared to revitalize the rivers, proffer clean environment, enhance the surrounding areas and create a city level asset. The Master Plan also takes into account rivers' cultural importance and their potential to add to the green recreational spaces to the city. It proposes a resilient river edge to mitigate the threat of flooding. The Master Plan also intends to integrate other parallel relevant projects like JICA infrastructure projects for Sewage Treatment. The Master Plan is phased prioritizing cleaning of the river, curbing outfalls and carrying out flood mitigation measures. A Special Purpose Vehicle is set by the State Government for monitoring the project in April 2021.

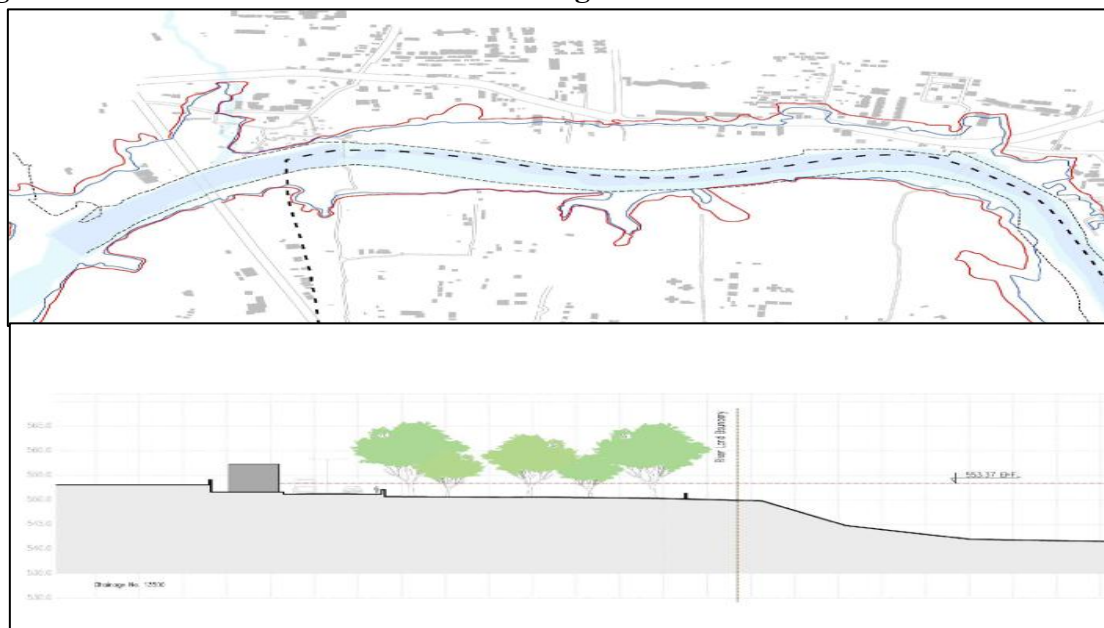
Figure 10.2 Master plan of river rejuvenation project (phases)



A Detailed Project Report is prepared following study of Topographic Survey of Longitudinal Rivers, Hydrology and Hydraulic Survey, Design Maps, Area Assessment Survey, Geology Survey etc. Hydrology and hydraulics modelling reports have been examined by CWPRS, Khadakwasla; Government body conducting research on water.

The Master Plan shows the project boundary, existing and proposed condition for each stretch, existing temples and crematoriums, immersion tanks, Ghats, river's course, lean period flow, river land based on land records, existing inundation lines (red and blue line), minimum width of the river as per hydraulics, barrages, bridges, proposed embankment types and promenades, land for Public amenities and utilities, access points to the river, existing and proposed activities like gardens, boating facilities, etc.

Figure 10.3 Stretch of river Mula and existing cross-section



Estimated cost of the project (with an area 768 Ha) as per current rates is around Rs 2619 Crores. The Project is phased in 11 stretches for execution. Stretch-2 (Aundh –Baner Smart City Area of length 8.50 km), Stretch-9 (Bund Garden Area of length 9.2 km) and Stretch-11 (Kharadi Area of length 7.1 km) are prioritized. PMC has funded Rs.300 Cr. for Stretch-9, Project Stretch-11 is considered to be developed with the PPP model.

Implementation of the project will increase carrying capacity of the river, preserve and protect heritage sites and residential areas near the river. The green belt along the river, with development of jogging track, benches, parks for citizens, public spaces and along the river and reversal of river bank debris / waste disposal will help in keeping the river clean.

10.2.5 Solid Waste Management

Solid Waste creates significant pressure on the environment through generation of landfills and leachate, land and water pollution, greenhouse gas emissions, obstruction of drains, infectious diseases and loss of biodiversity. PMC has completely stopped open dumping of waste from January 2020 as a part of steps for proper Solid Waste management.

a. Status of Solid Waste Production: Pune City generates around 2100-2200 MT solid waste, out of which about 90-95% waste is collected through “SWACH Sanstha” and 1200 MT dry waste and 900 MT wet waste is treated and disposed of.

b. Strategies and Action Plans for Solid Waste Management: The Department of Solid waste Management of PMC has set objectives-1. To process 100% of waste collected in Pune city, 2. To develop an integrated waste management system through citizen engagement, using IT solutions for monitoring the entire system, 3. Source Segregation of the waste, Segregated Collection and banning dumping on open land.

PMC is planning to process previously dumped solid waste by Bio-mining, as per the order of National Green Tribunal and reclaim the entire land by September 2024. (@ 16 Acres of land has already been reclaimed by processing 9.2 Lakh MT dumped solid waste).

Figure 10.4 Concrete capping at dumping site



- Conversion of plastic to high quality liquid oil (with higher calorific value than that of commercial fuel), through pyrolysis process with 100/150 kg capacity plant, is being planned on experimental basis, through CSR funding.

- About 16,000 trees have been planted at the Garbage Processing Plant (GPP) at Uruli Devachi and Fursungi, to act as a buffer zone, under AMRUT Forest scheme.

Figure 10.5 Plantation at dumping site



- A tank with a storage capacity of 12 lakh litres has been constructed for storage of leachate. After treatment Leachate Water is used for watering plants.

Figure 10.6 Leachate treatment at dumping site



- Scriptural Landfill (SLF) i.e. scientific landfill of the rejected solid waste (about 10 to 15% or 300 to 350 MT) from various solid waste processing projects in the city is being done on 8 acres of land at GPP, as per the Solid Waste Management and Handling Rules 2016. Proper care is being taken to prevent pollution in the area due to SLF.
- Wet waste generated from household, vegetable markets, coconuts, hotels, water hyacinth, gardens, etc. is planned to be processed via 'High density stalk

technology'. This technology will process the solid waste and will generate fuel as a by-product.

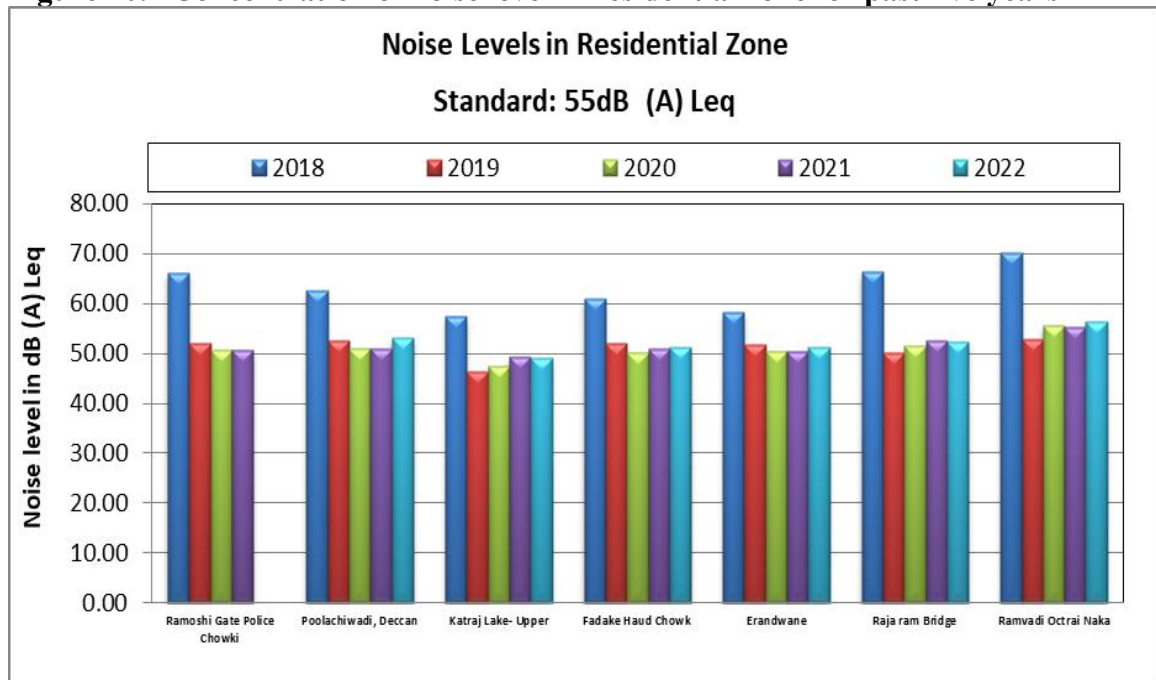
- The capacity of the existing solid waste processing unit at Uruli Devachi is proposed to be increased by 150 MT/day in addition to its original 200MT capacity.

10.2.6 Sound/ Noise Levels

Sound is typically described in terms of the loudness (amplitude), measured in decibels (dB) and the pitch (frequency) of the wave. The Central Pollution Control Board (CPCB), responsible for the enforcement of Noise Pollution control measures, has set a threshold of 55dB, 65dB and 50dB for Noise Level in Residential, Commercial and Silent Zone respectively. The Central Government enacted The Noise Pollution (Regulation and Control) Rules, 2000 for the regulation and control of noise-producing and generating sources. It provides for Silence zone as- “An area comprising not less than 100 m around hospitals, educational institutions and courts, may be declared by the State Government as silence area / zone where the use of horns, sound emitting construction equipment is restricted and bursting of firecrackers is restricted from 10.00 pm to 6.00 am”.

a. Status of Noise level: Noise Level in Residential, Commercial and Silent Zone in different localities in Pune city, from the past five years are shown by following graphs.

Figure 10.7 Concentration of noise level in residential zone for past five years

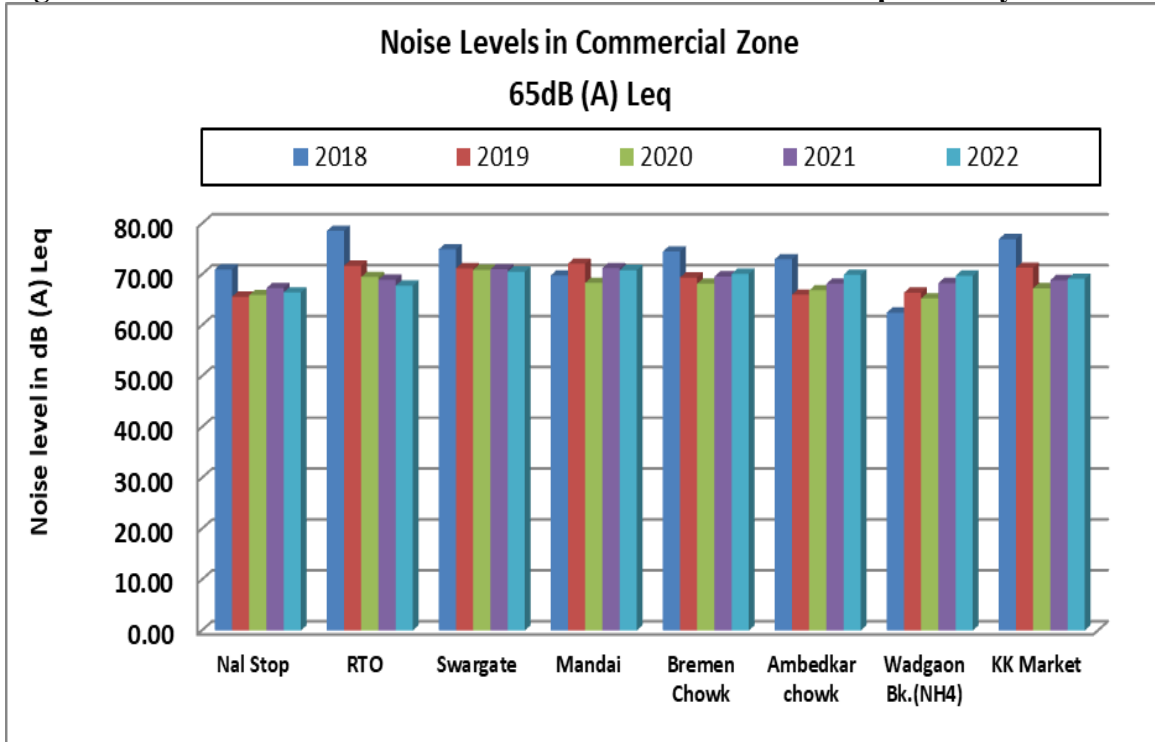


(Source: Environmental Status Report 2022-2023, PMC)

As seen from the graph, the noise level in residential zones in Pune city has come down and is well within 55 dB, since the last two years.

The noise level in the commercial zones of Pune city can be observed to be reduced slightly in the last 2 years; However it is still higher than the CPCB standards of 65 dB.

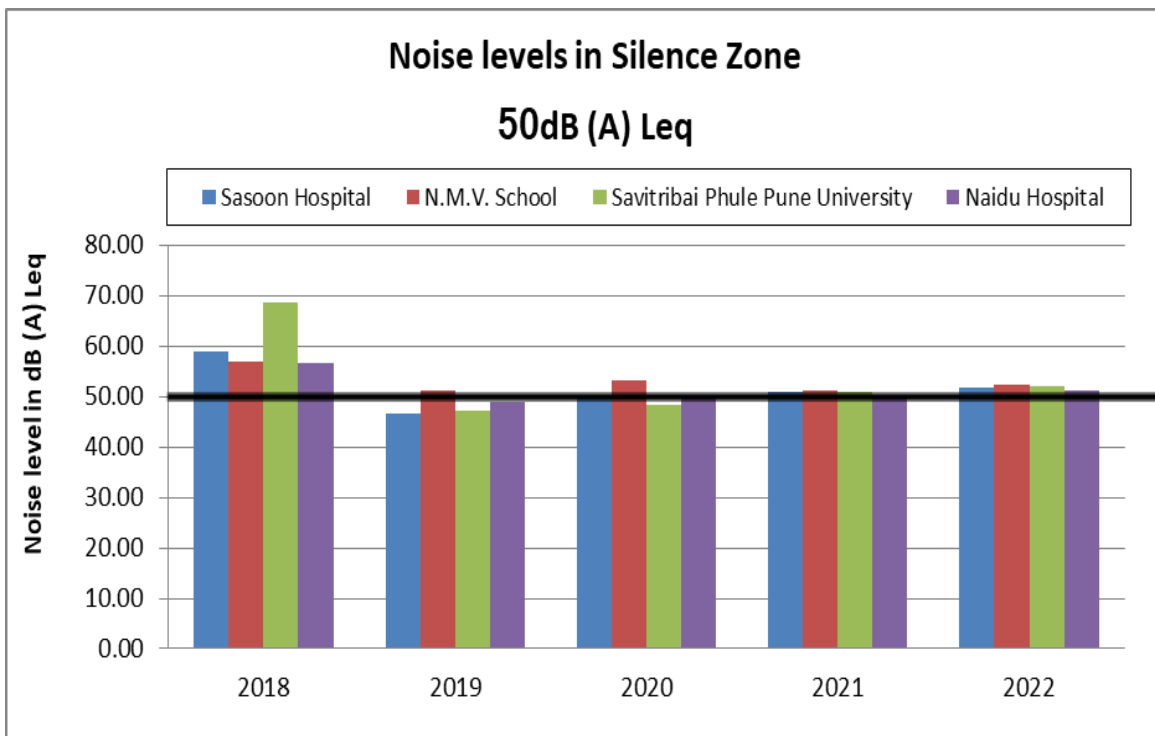
Figure 10.8 Concentration of noise level in commercial zone for past five years



(Source: Environmental Status Report 2022-2023, PMC)

As shown in the graph, after 2019 the noise level in the silent zone in Pune city is nearly 50dB matching the CPCB standards barring an exception.

Figure 10.9 Concentration of noise level in silent zone for past five years



(Source: Environmental Status Report 2022-2023, PMC)

b. Strategies and Action Plans to control Noise/Sound levels:

- PMC has declared 121 locations as Silence Zone, with proper sign boards
- Use of sound barrier/fencing around construction sites.
- Tree plantation along the roads to control the sound pollution.

The citizens are expected to follow the rules, avoid pressure horns, regular maintenance & oiling of vehicles and machineries and follow prohibitory orders on fire-crackers.

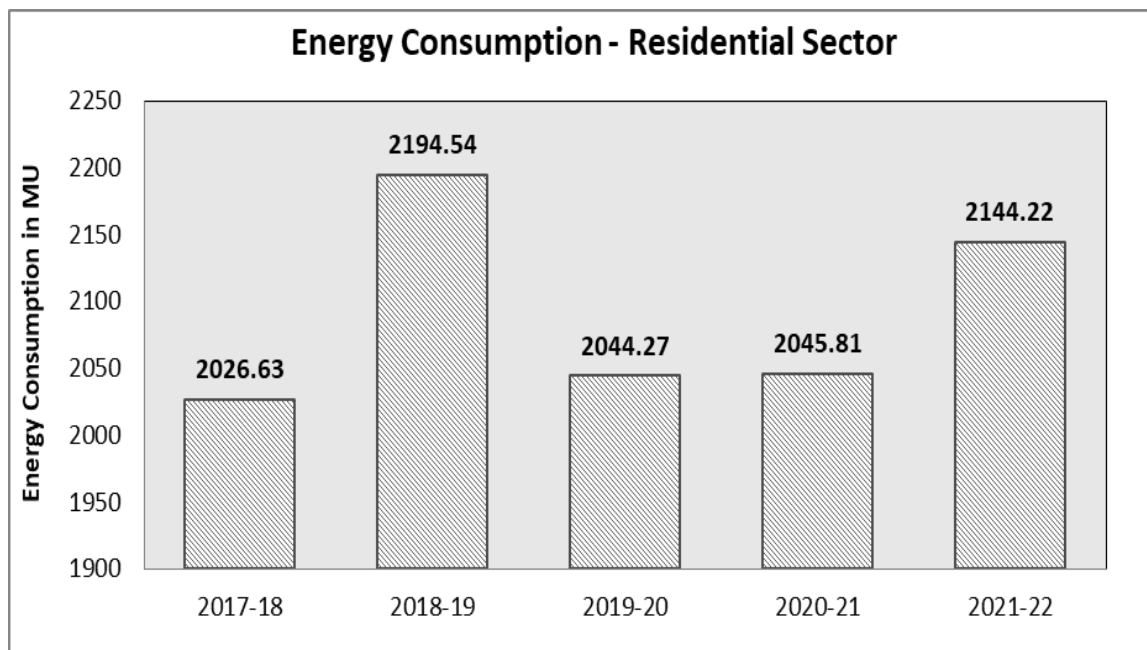
10.2.7 Energy Consumption

Production, delivery and use of energy sources have effects on the environment. The sun is considered an elementary form of energy on earth. Fossil fuels (coal, gas and oil) being cheap and abundant became main sources of energy, until the industrial revolution. Electricity is a secondary energy source as produced by converting primary sources. It can be easily converted into any other energy form and can be safely and efficiently transported over long distances. As a result, it is now used more than any other energy source. Apart from that Solar, CNG, LPG, Petroleum, etc. are also used as sources of energy.

a. Status of Energy Consumption: Pune city receives power from five 400 KV power substations situated in Chakan, Lonikand, Jejuri and Talegaon. The 400-KV transmission lines which come to these substations are further distributed as 220-KV power lines and further into 132-KV transmission lines. MSEDCL supplies electricity to the city. In the planning area, High voltage transmission (HT) lines are passing through Ambegaon Bk and Hadapsar-Sadesataranali. Major Electricity Sub-Stations is located in Hadapsar Sade Satra-Nali (over an area of 3.95 Ha).

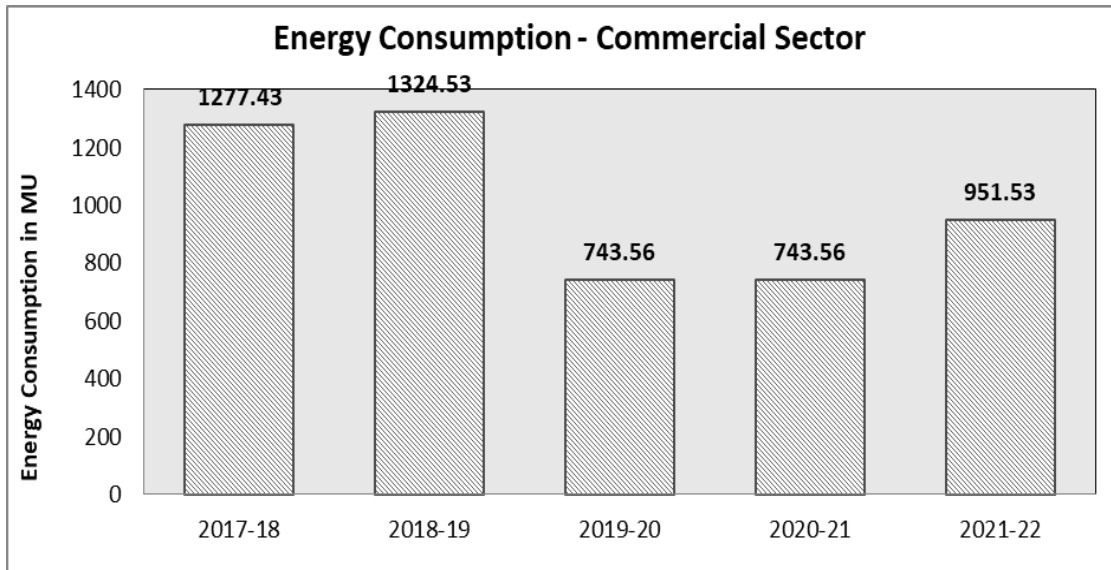
Increasing population, urbanization and growing industrial sector, is increasing energy demand. Sector Wise consumption in Millions Unit (MU) is shown in the following charts.

Figure 10.10 Yearly residential energy consumption in Pune city for past five years



(Source: Environmental Status Report 2022-2023, PMC)

Figure 10.11 Commercial energy consumption from in Pune city in last five years

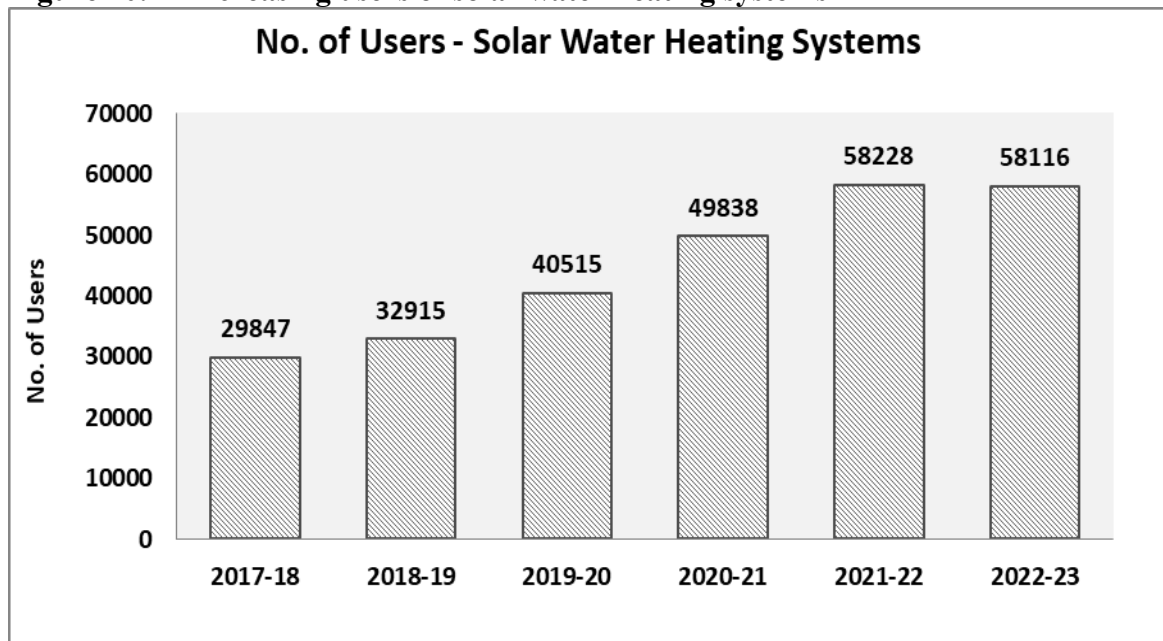


(Source: Environmental Status Report 2022-2023, PMC)

Total power Consumption in the city increased to 4982.89 as compared to last year which was 4463.59 MU. In the recent year 2021-2022, the highest energy demand is in residential areas (2144.22 MU) followed by Industrial (1330.29 MU) and Commercial areas (951.53 MU).

Pune aspires to become a ‘Maximum Solar City’ as it has ideal weather conditions for using solar devices. Currently about 20% of the houses in Pune are using solar water heating units. This percentage would increase because of Central and Local Government incentives like a soft loan scheme, interest subsidy and tax benefits. The following graph shows the increasing number of users from the year 2017-18 up to 2022-23.

Figure 10.12 Increasing users of solar water heating systems



(Source: Tax Department, PMC)

b. Strategies and Action Plans of Energy Consumptions:

- Energy saving control panels and LED lamps installed in the PMC Administrative building are saving 50% on the electric bill. 1,80,000 LED lamps are installed in the city. These measures are saving electricity equal to that generated by 20,427 tons of coal per year.)
- PMC has completed a 1.35MW solar energy project with the combined help of CAPEX and RESCO; to cater to additional energy requirements of PMC.
- 15-20% of electricity is planned to be generated by Rooftop Solar alone in the Local Area Development of Aundh, Baner and Balewadi as a part of Smart City Mission, as a city has to have at least 10% of electricity generated by renewable sources.

10.3 Climate Change

The periodic modification of Earth's climate brought about due to changes in the atmosphere as well as the interactions between atmosphere and various other geological, chemical, biological and geographical factors within the Earth's system is called "Climate Change". It is the long-term alteration of temperature and typical weather patterns in a place because of burning fuels, deforestation, increasing use of fertilizers, Fluorinated gases (Hydro-Fluorocarbons, Per-Fluorocarbons, Sulphur Hexafluoride, Nitrogen Trifluoride).

There are many economical, agricultural impacts of climate change including extreme weather events, changes in the timing of seasonal events, sea level rise, food insecurity, desertification and land degradation, intensified water cycle causing more intense rainfall and flooding, scarcity of water as well as more intense drought.

a. Status of Climate Change in Pune: The Mula-Mutha basin and Pune city have witnessed huge transformation in Land Use and Land Cover over the last three decades. Built-up area has increased from 32% in 1990 to 48% in 2019 (*Source: LULC from ESR 2019-20*) and is predicted to increase by 50% by 2025. (*Source: Sustainable Environment- An International Journal of Environmental Health and Sustainability; Mar 2024*) The impacts of these expansions on atmospheric temperature, humidity, cloud cover, circulation, and precipitation range from the local and regional scale to sub-continental and global-scale.

As a result, the rising temperatures in the city have led to an increased reliance on air conditioning systems. Additionally, changing rainfall patterns make the city vulnerable to flooding, waterlogging, and landslides. Heavy rainfall, excessive concretization, preventing water absorption, reduction in width of water courses raising the potential for disasters/ flash floods in low-lying areas, along streams and rivers, and on hill slopes.

b. Strategies and Action Plans for Climatic Changes in the City:

- Majhi Vasundhara' is an initiative of the Environment and Climate Change Department, Government of Maharashtra, to impart knowledge on the impacts of climate change and environmental issues to citizens. On 5.06.2022, the World Environment Day, PMC won 3rd position in the Amrit group at state level, in "Majhi Vasundhara 2.0 competition" to achieve sustainable development by conserving and protecting five elements of the environment.

- SMART Cities Climate Assessment Framework was launched for 100 Smart cities by the Ministry of Housing and Urban Affairs under the guidance of National Institute of Urban Affairs, in order to incentivize a holistic, climate responsive development. It provides air and climate relevant parameters to help cities to assess their preparedness to tackle climate change and air quality. Pune is rated four stars and selected in the first league at CSCAF 2.0.
- The Green-House Gases (GHG or Carbon Emissions) inventory is the first step toward climate action planning which helps in effective action. Google's Environmental Insights Explorer could help to accelerate the world's transition to a low-carbon future, which uses exclusive data sources and modeling capabilities in a freely available worldwide platform to measure emission sources, run analyses and identify strategies to reduce emissions.
- PMC is promoting eco-friendly urban development with the green Building concept. As discussed, earlier PMC accepts green building ratings issued by IGBC, LEED and GRIHA to incentivize green development. Also, initiated an anti-encroachment drive and construction of retaining walls in the flood zone after the flash flood in 2019.
- Climate Action Cell, PMC with the experts, relevant institutes and NGOs, analyses Climate change and Carbon emission through various studies to take the city towards Carbon Neutrality. Presently GCOM and NIUA are working on the Climate Action plan. It can lead to more energy-efficient buildings, better public transportation, green spaces, and cleaner industries, creating a higher quality of life for residents.

10.4 Planning Area from Environmental perspective

Planning area situated on the fringes of the main city, displays better Environmental quality. Amongst the nine villages, Dhayari and Ambegaon Khurd are in close proximity of Western Ghat and both villages have Forest reserve land, rich in biodiversity. Remarkable water bodies in the Planning area include Mutha river flowing along Shivane and Mundhwa (Keshavnagar), Indrayani River along Lohgaon, Gavtale in Dhayari, Jambhulwadi Lake in Ambegaon Khurd, Percolation tank in Undri, Harantale, Percolation tank in Lohgaon, major nallas flowing through Dhayari, Ambegaon Bk, Ambegaon Kh., Undri, which have a major impact on its environment. Lohgaon and Dhayari have vast stretches of vacant lands.

Development planning is a Strategic action to protect the environment and promote sustainability. In the DP provisions made for environment are as described below:

a. Conservation of Ecology and Biodiversity

- i. Reserve Forest at Lohgaon, Dhayari, Jambhulwadi Lake in Ambegaon Khurd, Harantale in Lohgaon and hilly areas are earmarked as Biodiversity sites.
- ii. Green belts and nalla gardens are proposed along Rivers and nallas. Development along water courses shall be governed by provisions of UDCPR2021 including the Red line and blue line of the rivers marked by the Irrigation department.
- iii. Proposed that the scope of the River Rejuvenation Project be extended to planning area.
- v. Low Density Residential zone is proposed in the DP, to retain the present ecology in undulating areas, by curtailing development density.
- vi. Provision for Urban Forest is made to preserve virgin pockets of natural vegetation in the city area and to develop green spaces with minimal human intervention.

b. Air Quality

- i. Land use is allocated to minimize emissions and exposure of people to air pollution.
- ii. Appropriate transport links are planned between the Residential, Commercial, Industrial, Institutional and workplace, recreational facilities to reduce travel time.
- iii. Almost every village from nine villages has been provided with Recreational Places.
- iv. Proposed urban forests will act as filters for pollution, absorb harmful gases, cool urban areas and moderate the heat island effect, reduce formation of photochemical ozone.

c. Groundwater, Water Management and Sanitation

- i. Necessary provisions are made in the DP for identified as Groundwater recharge sites in Undri, Dhayari, Shivane and to protect Water bodies in planning area.
- ii. Sites of Water Works, Water Storage tanks are proposed to cater to projected populations of Planning Area in the planning tenure along with augmentation of existing facilities and measures for reduction in losses.
- iii. Sites for Sewage Treatment Plants at the geographically suitable location are proposed along with augmentation of existing facilities.

d. Noise Pollution

- i. Reining Norms regarding noise pollution (e.g. from construction sites, industries, etc.) are imposed in the planning area as well.
- ii. DP has provided Green Spaces, Gardens, Green Belts, Urban Forest to minimize the Noise Pollution considering the ability of vegetation to attenuate noise.

e. Energy Consumption:

- i. Provisions are made for use of infrastructure more efficiently with appropriate sites.
- ii. Design of compact, walk-able neighborhoods with effective transport planning to the public places and amenities, along with ample provisions for multiple modes for transportation, Transit- oriented Development (Metro, BRT).
- iii. Best practices to support energy efficient land use like protecting green lands, vegetation and natural sites (lakes, rivers, hills), are adopted.

f. Climate Change

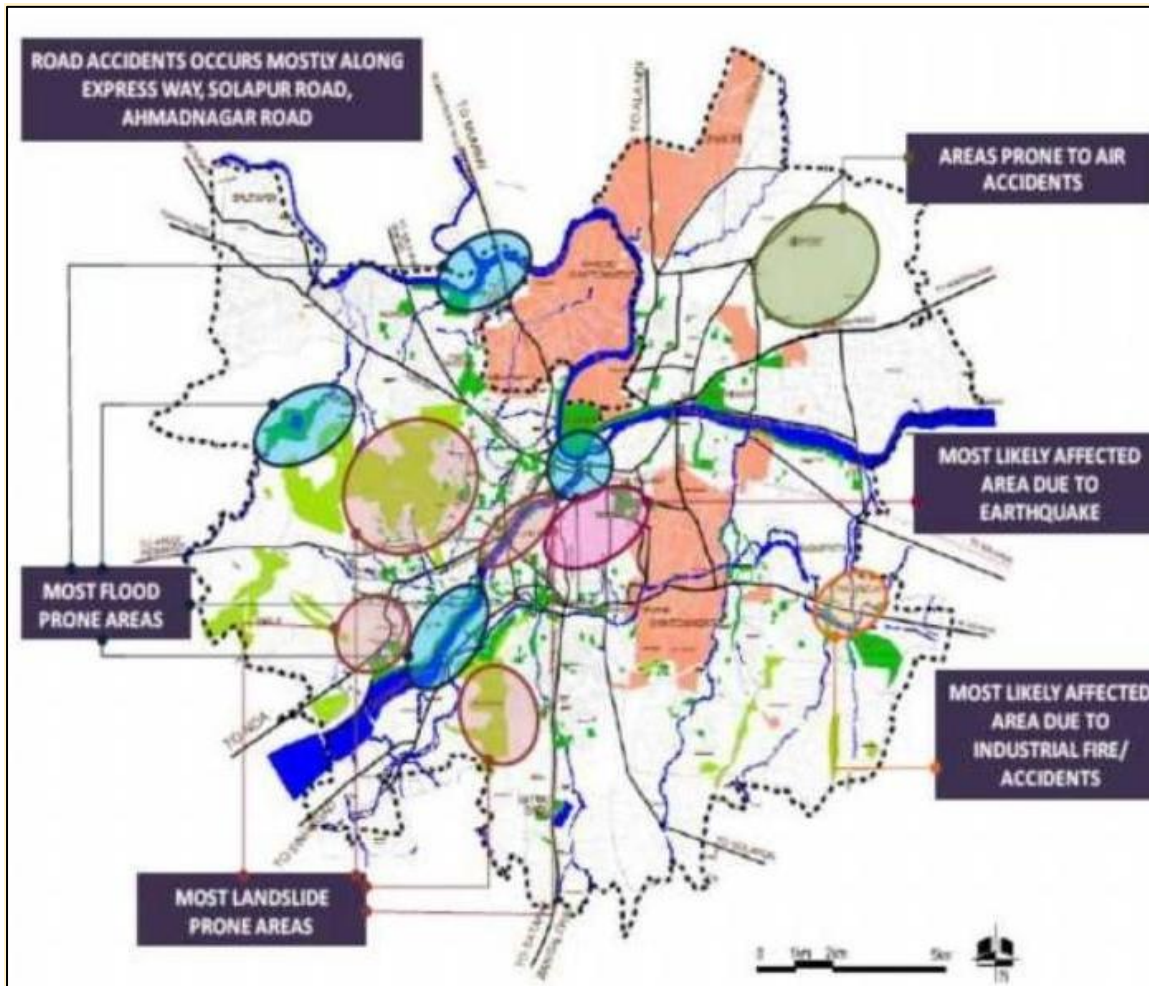
- i. Provisions of CMP; 2018 and Comprehensive Bicycle Plan-CBP (2017) adopted in the DP will help to minimize carbon emissions in the planning area.
- ii. Energy efficient land use, protecting green lands and natural sites, and increasing green cover will help to tackle climate change.

10.5 Disasters and Disaster Management

Disasters are serious disruptions to a community causing loss of livelihood and services. Disasters can be caused by natural, man-made and technological hazards, as well as, over-exploitation of resources, extreme urban sprawl and climate change.

a. Hazards for Pune city: The Environmental Status Report has portrayed the facts and figures of environmental threat to Pune with development, growth in population.

Figure 10.13 Overall hazard map of Pune city

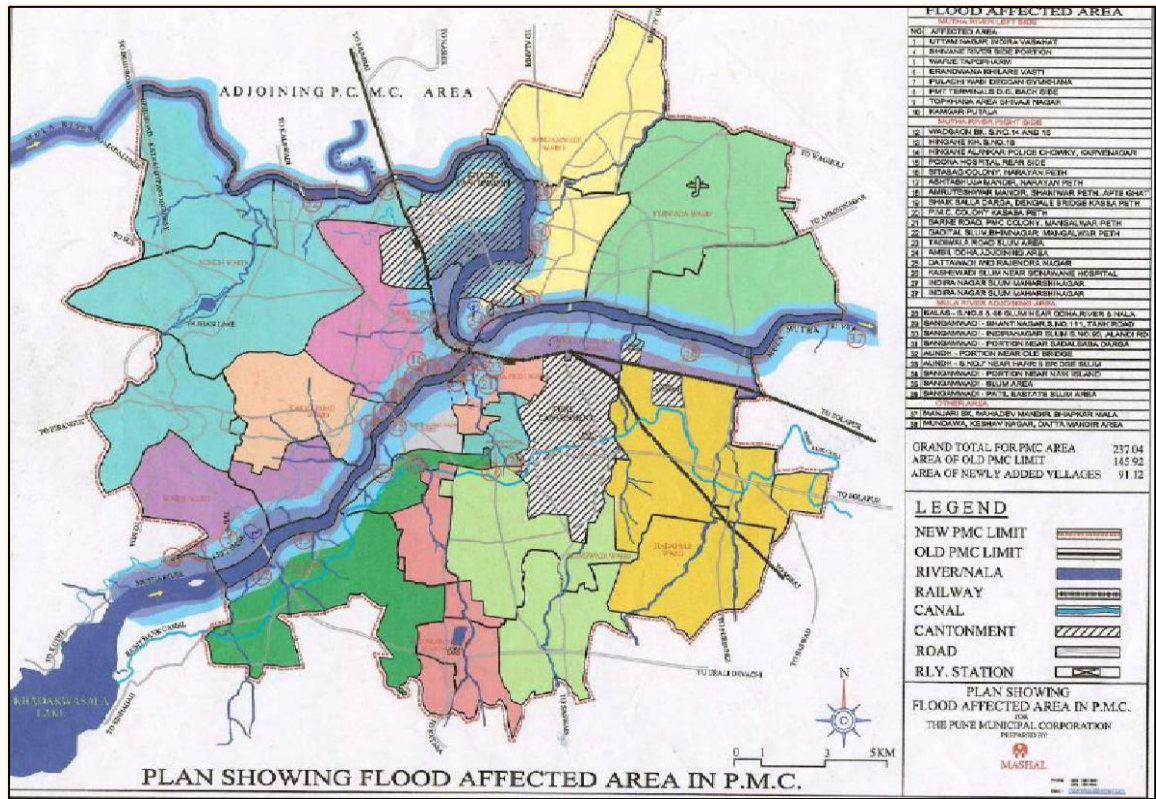


(Source: Regional Disaster Management Centre, PMC)

i. Earthquake- Pune lies very close to the seismically active zone around Koyna Dam, about 100 km south of the city, and has been rated in Zone 3 by the India Meteorological Department (intensity up to 7 on Richter scale). Probability of occurrence is 'Indeterminate'. Pune has experienced moderate-intensity and low-intensity earthquakes in its history.

ii. Floods and Flash Floods- Pune is located on the confluence of the Mula and Mutha rivers. There are 3 dams upstream of Pune. Water is released from the dams in monsoon resulting in flooding of Mula and Mutha. Even though constructions are not allowed in flood zones (earmarked by Blue line and Red line), there are some unauthorized constructions and slums in flood zones making them disaster prone. In September 2019, Pune received a heavy amount of rainfall in a short duration, causing flash flooding. The highest flood experienced by Pune was in 1961 due to the Panshet Dam burst.

Figure 10.14 Flood affected area in PMC



(Source: Action plan of Emergency Management and Flood Control Room 2022-2023, PMC)

iii. Landslides- Pune is surrounded by hills in most of the directions with some hills spurring up in the city area. The high pace of growth of the city is putting stress on the eco-sensitive areas like hill tops, hill slopes, which have become prone to landslide due to unchecked cutting of hills in suburban areas like Pachgaon- Parvati, Bhamburda, Bavdhan, Kothrud, Warje, Katraj and Ambegaon. Many un-authorized stone quarrying activities are still going on unabated in newly merged villages. Recently a major landslide was reported near old Katraj tunnel on Pune-Satara Road in July 2022 and at Sinhgad fort. The settlements of workers and slums on hill-slopes are at the highest risk.

iv. Fire- The fire cases reported vary from domestic fuel, electrical, chemical and hazardous material fires. The incidents occur due to open cooking, LPG cylinder burst, electrocution, illegal tapping of electrical open wires. Dense development, open eateries add to the risk of fires. Major incidents of fire in the recent past are - CrossWords, Sohrab hall (September 2015), A hotel at Lulla Nagar (Nov 2022), godowns at Bibvewadi (May 2023), etc.

v. Communal riots and Stampedes- People of different religions are staying peacefully in Pune. There have not been any major incidents of political/communal riot in the last few years. Pune has a huge congregation of people during two main celebrations: Pandharpur Wari and Ganesh Festival, with 3-5 lakh people visiting the city. High preparedness is required to avert untoward incidents, stampedes, riots at these events.

vi. Chemical and Industrial Hazards- Many small private industrial estates in the city lacking hazard handling capacity, are vulnerable to risk of industrial hazards due to

industrial accidents, Chemical leakages, fires, etc. Some industrial estates are hardly accessible by fire brigade vehicles, due to narrow roads and unruly parking.

vii. Terrorism- The bomb blast in recent years in Germany Bakery, series of bomb blasts on Junglee Maharaj Road and Faraskhana Police chowky bomb blast has placed Pune on the terrorism map. The military establishments and Airport make Pune vulnerable.

viii. Bio-disasters- 40% of the population lives in Slums in the city, with lack of hygiene, making them vulnerable to contagious, airborne and waterborne diseases. The city has shown a rise in events of epidemics like Covid-19, Swine Flu (H1N1). Dengue, Malaria, Chikungunya and Flu are some diseases, city is recently tackling.

10.5.1 Disaster Management

“Disaster management” refers to the protection of lives and property during natural or human-made disasters, with collection of data regarding hazards causing loss of life, property and working on the data to make the prevention, mitigation and preparedness plans.

a. Disaster Management Cell: A local Disaster Management Cell, abreast with the latest technology and techniques coordinates with Police, Fire Brigade, District Administration, Divisional Commissioners office, Irrigation Department, Department of Climatology, Secretariats, etc. to carry out vital functions and to respond quickly. Also, the cell takes action in case of violation of the code of conduct during disaster or calamity. Various Committees (such as Pune City Disaster Management Committee, Pune City technical Cell, Pune City Advisory committee) work together for the safety and security of the city. Center for training programs of NDRF (National Disaster Response Force) conducts Evacuation and Mock Drill for rescue operations from time to time.

The Regional Disaster management Center is equipped with 24X7 Control room set-up, Regional Disaster Management Plan, Communication systems.

b. Strategies and Action Plans of Disaster Management Cell for the city:

- 43 Temporary Disaster Relief Centers with allied staff services, are set up in the city with basic amenities like Drinking water, Sanitation, electricity and medical facilities, under the Flood Control and Disaster Management Action Plan.
- The Fire and Rescue vehicle deployed by PMC has the latest technology system with high pressure jetting system, GPS navigation system and infrared cameras, with combined features and functionality of both Fire Tendering as well as Emergency Rescue Operation and is capable of moving at high speeds also.
- CCTV to support Pune Police to maintain law and order, is an effective tool in case of emergency/ disaster. The system consists of 1363 cameras across 418 locations.
- List of Do's, Dont's and relevant tips are published on Website of PMC under “Precaution and guidelines during natural disasters- earthquake, flood, land-slides, Cyclones, Heat Wave, Emergency of Nuclear- Radiology, Biological and Chemical disaster and infectious diseases” as a part of Disaster Planning.

c. Disaster Management in the Planning Area:

In the planning area, urban sprawl with high tenement density, rampant exploitation of land is predominant in some pockets. Special attention is given to such disaster-prone localities, even though the city level Disaster Management takes care of the planning area as well.

- Redevelopment of urban sprawl areas in the planning area is proposed as Urban Renewal Scheme.
- In the event of a disaster, roads provide a vital link to emergency services, relief, and evacuation routes. Hence sufficiently wide roads are proposed in DP.
- The Sites are proposed for Disaster Management set-ups at appropriate places with proper connectivity and resources.
- The proposed Urban Spaces, open spaces, grounds, gardens, public amenity buildings in the DP will serve as shelters for the citizens during natural disasters.
- The sites of hospitals and trauma care centres are provided at accessible places, linked properly with other localities in the planning area.

PMC has been creating environment awareness & literacy. It promotes thinking, responsible citizenship and actions towards sustainable development, which could improve their environment performance. PMC has undertaken various projects for improvement in water quality and supply, sewerage system, air pollution control, energy consumption, noise levels and climate changes.

CHAPTER 11 : OBSERVATIONS AND INFERENCES

Introduction

This section presents a comprehensive assessment of the key developmental issues and emerging challenges within the nine newly merged villages under the jurisdiction of the Pune Municipal Corporation (PMC). It focuses on six critical themes-social and urban infrastructure, housing, transportation, environment, climate resilience, and institutional coordination-that define the present urban condition of the extended city limits. The analysis identifies major infrastructural gaps, environmental concerns, and governance challenges arising from rapid urbanization and provides strategic inferences to guide sustainable, inclusive, and balanced urban development across all merged areas.

11.1 Social and Urban Infrastructure Deficit

Observations:

- i) The nine villages show a distinct mismatch between the pace of urbanization among old city and extended limits. That is the reason why this area dependent on parent city for availability of essential social infrastructure such as schools, hospitals, community centers, and recreation spaces.
- ii) Educational facilities are present but are unevenly distributed- with villages like Hadapsar, Mundhwa, Undri showing relative adequacy, while others such as Ambegaon Khurd and Shivane have insufficient provisions.
- iii) Healthcare infrastructure lags significantly behind. The majority of settlements rely on private clinics or hospitals outside the planning area. There are few public health centers (PHCs), which poses a challenge during emergencies or pandemics.
- iv) Water supply and sanitation systems are under considerable strain. Elevated Service Reservoirs (ESRs) and Ground Service Reservoirs (GSRs) exist but operate at near-capacity, with frequent shortages in peak seasons.
- v) Recreational and cultural amenities such as playgrounds, gardens, and community halls are limited. The absence of green and open spaces contributes to deteriorating liveability and mental well-being.
- vi) Waste management systems are inadequate, with improper segregation, irregular collection, and occasional open dumping, leading to local environmental pollution.

Inferences:

- i) The rapid transformation of rural settlements into urban neighbourhoods has outpaced infrastructure planning.
- ii) The new development plan must ensure equitable access to social amenities by reserving sufficient land for public facilities under the UDCPR norms and national urban planning standards.
- iii) Priority should be given to localized service centers (neighbourhood-level amenities) rather than centralized facilities to reduce travel time and ensure inclusivity.
- iv) Integration of smart water and waste management technologies can optimize limited resources.

- v) Strengthening the health and education network is essential for improving social equity and quality of life.

11.2 Rapid Urban Expansion and Housing Pressure

Observations:

- i) The nine villages have experienced intense urbanization, with agricultural and vacant lands rapidly converted into residential layouts.
- ii) There is a dual pattern of housing — formal sector (apartments, gated townships, plotted developments) and informal sector (slum-like settlements, unauthorized constructions).
- iii) Housing densities in villages like Ambegaon Khurd, Mundhwa, and Dhayari are significantly higher than PMC norms.
- iv) Many residential structures are over 20–30 years old and built without adherence to prevailing regulations and modern building codes, making them legally and structurally unsafe.
- v) The survey revealed deficiencies in light, ventilation, sanitation, and fire safety, particularly in congested inner areas.
- vi) The cost of land and rental housing has increased sharply post-merger, reducing affordability for low-income and migrant populations.
- vii) A large portion of the population now depends on rented housing, often in substandard conditions.

Inferences:

- i) There is a clear imbalance between housing supply and demand, which will worsen with future population growth.
- ii) The Development Plan must promote affordable housing, redevelopment of dilapidated structures, and mixed-income housing through policies like Pradhan Mantri Awas Yojana (PMAY), MHADA schemes, and Public-Private Partnerships (PPP).
- iii) Mechanisms such as Transferable Development Rights (TDR) and incentivized Floor Space Index (FSI) can encourage redevelopment in older areas.
- iv) The introduction of rental housing models and transit-oriented housing can reduce informal growth and commuting pressures.
- v) Sustainable housing practices, energy-efficient materials, rooftop solar, and rainwater harvesting must be integrated into building approvals.

11.3 Transportation and Mobility Challenges

Observations:

- i) The existing road network in the nine villages is narrow, discontinuous, and poorly maintained, leading to severe congestion and bottlenecks.
- ii) The modal share is skewed towards private vehicles, while public transport coverage is minimal or absent in several areas.
- iii) Villages like Dhayari, Ambegaon, and Undri have limited connectivity to major employment hubs, forcing dependency on two-wheelers and private cars.

- iv) Non-Motorized Transport (NMT) infrastructure such as pedestrian walkways and cycling lanes is missing, making mobility unsafe for vulnerable users.
- v) Parking shortages, encroachments, and lack of traffic discipline increases mobility issues.
- vi) Although macro-level projects- Ring Roads, Metro extensions, BRTS corridors, etc. are proposed, their integration with the newly merged villages is incomplete.

Inferences:

- i) Future mobility planning must focus on multi-modal integration, ensuring last-mile connectivity between residential areas and transit stations to CBDs.
- ii) Implementation of Transit-Oriented Development (TOD) and Complete Streets policies can promote compact growth and reduce congestion.
- iii) Encouraging public transport use through improved frequency, reliability, and accessibility is essential to lower emissions and travel costs.
- iv) Introducing Parking Management Zones and Intelligent Transport Systems (ITS) can regulate traffic flow effectively.
- v) Sustainable urban mobility will require the development of dedicated cycling and pedestrian infrastructure along with green corridors.

11.4 Environmental Degradation and Ecological Stress

Observations:

- i) The natural features of the extended area - hills, rivers, and forests - are under threat from encroachments, illegal dumping, and deforestation.
- ii) Water bodies like the Mula and Mutha Rivers, Jambhulwadi Lake, and smaller nallas show signs of pollution from untreated sewage and solid waste.
- iii) Air quality monitoring indicates a gradual increase in particulate matter (PM₁₀ and PM_{2.5}) due to vehicular and construction emissions.
- iv) Noise levels in commercial and mixed-use areas often exceed CPCB standards, contributing to urban stress.
- v) Rapid land-use conversion has reduced green cover, impacting biodiversity and microclimate.
- vi) Groundwater levels are declining because of over-extraction and lack of recharge systems.

Inferences:

- i) There is an urgent need to integrate environmental protection into the planning framework.
- ii) The DP should include dedicated green belts, eco-sensitive zones, and river buffer zones to preserve natural ecosystems.
- iii) The River Rejuvenation Plan and solid waste management reforms must be implemented on priority to restore ecological balance.
- iv) Promotion of renewable energy, energy-efficient buildings, and urban afforestation programs can help mitigate environmental degradation.
- v) Environmental monitoring through GIS and remote sensing can ensure ongoing compliance with sustainability standards.

11.5 Climate Resilience and Disaster Preparedness

Observations:

- i) The planning area is prone to flooding during monsoons, particularly in low-lying settlements near rivers and streams.
- ii) Hill-side developments such as in Ambegaon Khurd and Dhayari face the risk of soil erosion and landslides due to unplanned construction.
- iii) The stormwater drainage network is inadequate, and many natural watercourses have been encroached or converted into roads and plots.
- iv) Climate change has led to erratic rainfall patterns, extreme heat days, and longer dry spells, affecting water security and health.
- v) There is limited institutional capacity for disaster response, risk mapping, and early warning systems.

Inferences:

- i) Building a climate-resilient city requires embedding disaster risk reduction into all stages of land-use planning and infrastructure design.
- ii) Strengthening stormwater management, flood zoning, and emergency response networks is critical.
- iii) Adoption of nature-based solutions such as urban wetlands, green roofs, and permeable pavements can reduce flood risks and heat stress.
- iv) The DP should incorporate climate adaptation frameworks guided by the National Disaster Management Authority (NDMA) and Climate Smart Cities Assessment Framework (CSCAF).
- v) Institutional training and community participation are essential for effective disaster mitigation.

11.6 Institutional and Policy Coordination

Observations:

- i) Governance overlaps exist between multiple agencies - PMC, PMRDA, MIDC, and other state departments, causing delays in project implementation.
- ii) Fragmented planning and jurisdictional disputes have led to inconsistent land-use controls and service delivery.
- iii) Citizen participation in planning has been minimal, though public consultations revealed clear local priorities such as better mobility, water supply, cleanliness, and open spaces.

Inferences:

- i) Effective implementation of the DP will require institutional integration and inter-departmental coordination.
- ii) Establishing a centralized GIS-based planning and monitoring system will help align efforts across agencies.
- iii) Regular review and auditing mechanisms must be instituted to track the progress of development proposals.

- iv) Encouraging citizen engagement and transparency through online portals and participatory budgeting can build public trust and accountability.

11.7 Conclusion

The analysis indicates that the nine villages are experiencing a complex and dynamic phase of urban transition, characterized by rapid physical expansion, demographic growth, and rising infrastructural demands. This transition has led to imbalances, as social and civic infrastructure, housing supply, transportation networks, and environmental systems have not evolved in step with the pace of urbanization, resulting in disparities in access, quality, and capacity. Recognizing these challenges, the Development Plan adopts a comprehensive, integrated, and multi-sectoral approach aimed at achieving equitable infrastructure distribution, sustainable housing development, multimodal and inclusive mobility, ecological preservation, and climate resilience. Particular attention has been given to ensuring minimal impact on existing developments and the current road network, with new roads and proposals framed accordingly. Wherever feasible, designated sites for social infrastructure have been incorporated within existing amenity spaces of sanctioned layouts. Furthermore, adequate provisions have been made for essential urban infrastructure, including water treatment plants, overhead water tanks, sewage treatment plants, bus depots, and other key facilities. Strong institutional coordination and participatory governance mechanisms are emphasized to ensure effective implementation and public accountability. Overall, the Development Plan envisions harmonizing urban expansion with environmental conservation, infrastructure efficiency, and social inclusivity, fostering a city that is modern, well-connected, livable, resilient, and equitable for all residents.

CHAPTER 12 : STATUTORY BACKGROUND AND APPOINTMENT OF OFFICER

Introduction

The nine villages under planning area, incorporated into the jurisdiction of Pune Municipal Corporation (PMC) were good example of rural character with Peri-urban sprawl till late 90s. However, the developments in the IT and other Industries sector within Pune metropolitan region has been a long-standing process, with significant growth occurring from the early 2000s to the present day in terms of job openings and migrated population, housing issues, traffic and transportation problems, burden on existing infrastructure etc. then area and provisions of Pune city were definitely not compatible. It's evident that, the development follows no boundaries of the jurisdictions of various authorities like PMC, PCMC or other municipal councils. Therefore, to regulate the development and to cater to it, the authorities need to expand.

The earlier attempt of such expansion of Pune municipal corporation by the state govt. was merger of 23 villages within PMC limits on Sept 11, 1997. The names of villages are Baner, Balewadi, Bavdhan-Kh, Kothrud, Warje, Shivne, Hingne-Kh, Wadgaon-Kh, Wadgaon-Bk, Dhayari, Dhankawadi, Ambegao-Bk, Ambegaon-Kh, Kondhwa-Kh, Kondhwa-Bk, Katraj, Undri, Mohammadwadi, Hadapsar, Wadgaon Sheri, Kharadi, Kalas, Dhanori. Out of these 23 villages Shivne, Dhayari, Ambegao-Bk, Ambegaon-Kh, Undri, and Hadapsar are notified partially for merging within PMC due to several reasons. Also, in the earlier old limit of PMC some villages like Lohegaon, Hadapsar, Mundhwa were also included partially on its formation. With all these partial remaining villages and additional three villages, the state govt. included additional 11 villages to the PMC limit on Oct 4, 2017. These newly merged villages were Lohgaon (remaining), Mundhwa (remaining Keshavnagar), Hadapsar (remaining Sadesatra nali), Undri (remaining), Ambegao-Bk (remaining), Ambegaon-Kh (remaining), Dhayari (remaining), Shivne (remaining), Shivne (Uttamnagar), Fursungi & Uruli devachi. Out of the above 11 villages, Fursungi & Uruli devachi was demerged from PMC limit and converted in to a separate municipal council on Sep 11, 2024 and thus excluded from planning area.

Actual planning attempts were initiated for entire 11 villages vide. resolution no. 160 dated 28/06/2018 by Pune Mun. Corp. for declaration of intention to prepare the development plan (DP) for the said area. Thereafter the authority has appointed their Town planning officer as per provisions of section 24 of MRTTP act. The authority made surveys, prepared the base maps, prepared GIS database etc. for the same, however they could not publish the DP within the timelines as mentioned in the original time limit under section 26 of the said act i.e. March 02, 2023, as well as the extended time limit sanctioned by the Director Town Panning, Maharashtra State under the said section of the said act i.e. March 02, 2024. Therefore, considering the fact that the authority is in default for publication of the said DP, the Joint Director of Town planning, Pune division, Pune, with consultation to Govt. issued the order dated Aug 23, 2024 under section 24(1a) of the said act to appoint an officer for publication of DP under section 26(1a) and the further necessary legal procedure till submission of the DP to government under Section 30 of the said act. The officer appointed was Mr. Abhijit Bhaskar Ketkar, Asst. Director Town Planning, Pune branch,

Pune, and the order was retrospectively applied from March 03, 2024 i.e. the date before which the authority was expected to publish the said DP.

The appointed officer then reinitiated the procedure. The necessary base maps and allied data was procured from the concerned PMC authorities with request to municipal commissioner from time to time, necessary meetings with the officials earlier worked on the project, necessary site visits etc. It is expected from such appointed officer to execute the task and complete the legal and technical procedures, within the time limit fixed by The Director, Town Planning, Maharashtra State. It is pertinent that all the involved cost for preparation of the DP along with allied activities to be borne by the authority.

Thus, after considering all the above aspects and obtaining the necessary data from the authority in both hard copy and digital formats, the appointed officer, taking into account the available data, the current stage of work at the authority, the actual conditions within the planning area, the resurvey of relevant technical aspects, and the available timelines, has prepared the proposed Land Use Map and other components of the Development Plan. The said Development Plan (DP) is hereby published under Section 26(1) of the said Act.

The development plan is prepared using latest technologies like Geo reference maps, GIS platform, drone surveys, etc. Care has been taken for optimal use of these technologies to achieve the goals and objectives of the said plan through precise mapping and data base management.

CHAPTER 13 : PROPOSED LAND USE

Introduction

The nine villages recently incorporated into the jurisdiction of Pune Municipal Corporation (PMC) present unique challenges as well as opportunities. Earlier studies have highlighted deficiencies in infrastructure, amenities, and balanced land use, along with issues of unplanned growth and environmental stress. At the same time, these villages hold significant potential for contributing to the city's housing, economy, and cultural fabric.

The Development Plan aims not only to address existing gaps but also to introduce forward-looking strategies that ensure their orderly integration into the metropolitan framework. By focusing on sustainable land use, upgraded infrastructure, inclusive amenities, and conservation of natural and cultural assets, the Plan seeks to position these villages as vibrant, well-serviced, and sustainable urban extensions of Pune City. It provides a pro-development roadmap that will guide growth, enhance quality of life, and promote resilience for the horizon year 2045.

13.1 Vision Of Development Plan

To transform the nine villages within PMC limits into well-integrated, sustainable, and vibrant urban extensions of Pune City by guiding land use, infrastructure, and community development in an orderly and inclusive manner.

13.2 Main Goals of the Development Plan

- i) Achieve equity by ensuring balanced development across all villages.
- ii) Upgrade physical and social infrastructure to metropolitan standards.
- iii) Enhance mobility through multimodal transport and better road connectivity.
- iv) Protect environmental resources and conserve village heritage.
- v) Strengthen economic opportunities through local enterprises and service-based growth.
- vi) Ensure effective implementation through innovative planning tools and participatory governance.

13.3 Objectives of the Development Plan

- i) Guide land use in a disciplined and rational manner to accommodate future growth.
- ii) Provide adequate housing, including affordable and inclusive options, in line with projected demand.
- iii) Reserve land for education, health, recreation, and community services in proportion to population.
- iv) Integrate village cores through planned redevelopment, while retaining cultural identity.
- v) Expand green and recreational spaces for ecological balance and quality of life.
- vi) Encourage public transport, non-motorized movement, and transit-oriented development.
- vii) Promote renewable energy, waste management, and water conservation for sustainable urbanization.

- viii) Make effective use of tools such as TDR, FSI, Accommodation Reservation, PPP, and Town Planning Schemes for implementation.

13.4 Planning Sectors

For the purpose of effective planning and to achieve a better spatial understanding of the proposed land use plan, the nine villages within the planning area have been systematically divided into eight sectors. These sectors have been delineated based on factors such as planning convenience, area characteristics, and identifiable physical boundaries. The sectors, designated as Sector 1 to Sector 8, serve as the basis for assessing the adequacy and spatial distribution of amenities and infrastructure within the planning area.

Table 13.1 Planning sectors

Villages	Sector No.	Area (Ha)
Lohgaon (Remaining)	1	1979
Mundhwa (Remaining Keshav Nagar)	2	467.10
Hadapsar (Entire Sadesatra Nali)	3	326
Undri (Remaining)	4	434.4
Ambegaon Budruk (Remaining)	5	247.36
Ambegaon Khurd (Remaining)	6	376.17
Dhayari (Remaining)	7	942
Shivane (Remaining) & Shivane Uttam Nagar	8	779

13.5 Demographic Projections

The Development Plan for the nine villages has been prepared with a 20-year planning horizon up to 2045. Civic amenities are proposed considering the year 2035, while land use and infrastructure planning extend up to 2045.

Conventional projection methods were found unsuitable due to limited demographic data and the impact of migration. Hence, the Gokhale Institute of Politics and Economics (GIPE) adopted alternative approaches based on the availability of developable land and the growth potential of each village. Among these, Method 1 – Scenario 2 provided the most realistic population estimates.

In view of the extended planning period up to 2045, the population projections for the years 2025, 2035, and 2045, derived using Method 1 – Scenario 2, have been adopted for planning purposes. This ensures that the Development Plan remains consistent with the GIPE methodology while providing a realistic and updated demographic framework for the newly merged villages.

Table 13.2 Projected population of nine villages for the years 2018, 2023, 2025, 2035 and 2045 assuming variable rate of growth

Name of the Village	Projected population				
	2018	2023	2025	2035	2045
Ambegaon Budruk	67752	71817	73199	80519	88571
Ambegaon Khurd	35544	39809	41287	49545	59454
Dhayari	36758	49624	53816	79617	111464
Hadapsar	46981	63424	68782	103794	141977
Lohgaon	122627	165546	172867	280390	392634
Mundhwa	68376	81709	86111	111945	145527
Shivane & Shivane Uttam Nagar	55410	58735	59865	65851	72437
Undri	30280	38516	41197	57259	77299
Total	457728	568180	603787	810601	1056937

After analyzing the result obtained, the population projection is given below

Year	Projected Population	Purpose
2035	810601	For Social Amenities
2045	1056937	For Zoning

13.6 Paradigm Shift

The Draft Development Plan for the nine villages within Pune Municipal Corporation (PMC) marks a significant departure from earlier fragmented planning practices. This paradigm shift ensures a holistic, technology-driven, and regulation-compliant approach to urban growth management. The key aspects of the paradigm shift are outlined below:

13.6.1 Comprehensive and Integrated Coverage

For the first time, a unified Development Plan encompasses the entire jurisdiction of the newly merged villages. This integration ensures that peri-urban and rapidly urbanizing areas are brought under a structured planning framework, aligned with the overall PMC vision.

13.6.2 Accurate Land Records and GIS-Based Mapping

Leveraging high-resolution satellite imagery, detailed total station surveys, and GIS-based mapping, a precise land record base has been created. This ensures elimination of past discrepancies in boundary definitions, enabling transparent and effective implementation of development proposals.

13.6.3 Strategic Reservation of Public Amenities

In accordance with Sections 22 and 31(5) of the MR&TP Act, 1966, the DP emphasizes provision of town-level amenities with realistic acquisition potential. While core civic obligations are addressed through planned reservations, the role of private stakeholders in education, healthcare, and allied services is acknowledged, thus optimizing land use and minimizing acquisition burdens.

13.6.4 Dynamic and Flexible Planning Norms

Planning regulations have been framed in line with the Unified Development Control and Promotion Regulations (UDCPR), facilitating vertical growth and optimal FSI utilization. Wider roads and major corridors within these villages are earmarked for enhanced FSI and TDR-based densification, thereby ensuring efficient use of infrastructure and reducing uncontrolled sprawl.

13.6.5 Sustainable Urban Growth and Corridor Development

The DP introduces a shift from uniform growth patterns to corridor-based densification, focusing on transport connectivity and economic hubs. This approach promotes compact, sustainable, and transit-oriented development, balancing ecological sensitivity with urban expansion.

13.6.6 Technology-Driven Transparency

This Development Plan is PMC's first major DP for merged areas that is entirely GIS-based, enabling improved spatial analysis, data-driven decision-making, and enhanced stakeholder participation. This digital framework fosters accountability, transparency, and efficiency in plan implementation.

13.7 Policy Framework

1. Roads

Deviation from Sanctioned Regional Plan:

In the earlier Regional Plan (RP) for the fringe areas, a tentative network of major roads was proposed to guide connectivity. However, in the present Development Plan for the newly merged villages under PMC, certain deviations have been made considering the ground realities. In several locations, the implementation of RP-proposed roads has become difficult due to substantial existing development, encroachments, or natural constraints. In such cases, the proposed alignments have been realigned, modified, or strategically omitted. Alternative road links have been introduced to ensure continuity of connectivity, smoother junction design, and better integration with the urban road hierarchy. Some road

stretches have also been widened to accommodate present and projected traffic demand. ([Annexure 1](#))

Allocation of New Roads:

In addition to the retained and realigned RP roads, the present Development Plan proposes a network of new roads to:

- Create smaller and efficient block sizes for improved accessibility.
- Provide seamless connectivity between different parts of the merged villages and the PMC core city.
- Integrate the network with adjoining regional corridors under PMR and PMRDA.
- Improve access to newly zoned and presently underserved areas.
- Strengthen the overall transport network to support safe, efficient, and sustainable mobility up to the horizon year 2043.

2. Land Use Zones

Deviation from Sanctioned Regional Plan:

In the earlier sanctioned Regional Plan (RP), broad land use zones were demarcated for the fringe areas primarily to regulate urban growth and safeguard environmentally sensitive pockets. However, while preparing the present Development Plan for the newly merged villages under PMC, certain deviations have been necessitated to respond to the evolving urban dynamics, demographic growth, and on-ground realities. In several locations, the RP-designated uses could not be implemented due to extensive existing development, changes in settlement patterns, or ecological and infrastructural considerations. Accordingly, land use zones have been rationalized, reclassified, or redistributed to achieve a more balanced and sustainable infrastructure and urban form.

Allocation of New Land Use Zones:

In addition to the retained RP-designated areas, the present Development Plan introduces strategic modifications to:

- Accommodate the rapid population increase and associated demand for housing through optimized residential zoning.
- Promote economic activity by earmarking adequate areas for commercial, mixed-use, and industrial purposes in proximity to growth corridors and transport networks.
- Strengthen social infrastructure by reserving land for public amenities, education, health care, and recreational spaces to serve the merged villages.
- Protect and enhance environmentally sensitive areas such as hills, water bodies, and green belts through stricter conservation zoning.
- Provide a more equitable distribution of land use across the planning area, ensuring accessibility and reducing pressure on the PMC core city.

Through these modifications, the Development Plan seeks to create a balanced and integrated land use pattern that addresses both existing deficiencies and future needs up to the horizon year 2045. ([Annexure 1](#))

3. Flood Lines

As per the directions of the Chief Engineer, Pune Division, the blue and red flood lines for the newly merged villages were obtained from the Water Resources Department (WRD). These maps were geo-referenced in the GIS environment, digitized, and superimposed on the land record base map prepared for the Draft Development Plan. The flood lines incorporated in this Development Plan are to be treated as indicative, and any future revisions issued by the Irrigation Department shall be applicable. It is further recommended that prior approval from the Irrigation Department be made mandatory before sanctioning any building permissions within identified inundation areas.

13.8 Proposed Land Use Zoning

13.8.1 Residential Zone

The residential zone constitutes the largest share of the total planning area, highlighting the priority given to accommodating projected population growth within the newly merged villages. In the Proposed Land Use (PLU), residential areas have been significantly expanded by converting portions of vacant and agricultural land for housing. This ensures an adequate housing supply, supports diverse housing typologies, and promotes integrated, walkable, and self-sufficient neighborhoods. The expansion enhances connectivity with the existing urban fabric and ensures access to essential social and physical infrastructure. The total area under the residential zone is 2,356.64 hectares, accounting for 42.0% of the total area.

13.8.2 Commercial Zone

In the PLU, commercial zones have been strategically enhanced to strengthen the local economy and improve accessibility to goods and services. The increased allocation supports mixed-use development along major transportation corridors, arterial roads, and junctions. The spatial distribution of commercial areas ensures a hierarchy of markets-ranging from neighborhood shopping areas to district-level centers-thereby creating employment opportunities and fostering economic vitality. The total area under the commercial zone is 74.84 hectares, constituting 1.3% of the total area.

13.8.3 Industrial Zone

The proposed plan includes a deliberate expansion of industrial zones to promote balanced economic growth and employment generation. These areas are located near major road networks to facilitate logistics and minimize conflict with residential uses. The PLU emphasizes environmentally compatible industries, small and medium enterprises, and service-based industries to diversify the local economy. This planned industrial allocation also helps decongest the existing city core. The total area under the industrial zone is 158.68 hectares, representing 2.8% of the total area.

13.8.4 Recreational Zone

The proposed land use places strong emphasis on recreational and open spaces, recognizing their importance for livability and environmental quality. The increased allocation reflects a commitment to developing parks, gardens, sports grounds, urban greens, and buffer spaces integrated with residential and institutional areas. This approach supports

community health, ecological balance, and sustainable urban growth. The recreational zone covers 292.32 hectares, making up 5.2% of the total area.

13.8.5 Public-Semi Public Zone

The PSP zone has been expanded to ensure equitable distribution of social infrastructure such as educational institutions, healthcare facilities, government offices, and community halls. This enhanced allocation meets projected service demands from the growing population and promotes inclusive development. The integration of PSP areas within residential and mixed-use zones ensures better accessibility and convenience for residents. The total PSP zone area is 227.76 hectares, accounting for 4.1% of the total area.

13.8.6 Public Utility Zone

The PLU increases land under the public utility category to accommodate essential urban infrastructure such as water supply systems, sewage treatment plants, electric substations, and solid waste management facilities. This supports the development of a sustainable and resilient infrastructure network capable of efficiently meeting future demands. The total area under the public utility zone is 119.45 hectares, comprising 2.1% of the total area.

13.8.7 Transportation Zone

Transportation infrastructure has been substantially enhanced in the PLU to improve connectivity within and beyond the newly merged villages. The expanded area includes new road alignments, proposed link roads, bus depots, terminals, and provisions for future metro or BRTS corridors. This ensures a well-connected transport network that supports mobility, reduces congestion, and integrates the region into the larger metropolitan system. The transportation zone covers 834.55 hectares, constituting 14.9% of the total area.

13.8.8 Defence Zone

The defence zone has been retained and delineated in the PLU to preserve the security, operational, and institutional requirements of defence establishments. No major alterations are proposed, though adequate buffer areas and restricted development controls are incorporated to maintain safety, prevent encroachment, and ensure operational integrity. The defence zone covers 579.32 hectares, representing 10.3% of the total area.

13.8.9 Prohibited Buffer Zone

The prohibited zone refers specifically to the Indian Air Force (IAF) Bomb Dump Buffer Area located entirely within Lohgaon village. This high-security area, under IAF control, serves as a buffer for ammunition storage and defence operations. Civilian development is strictly prohibited. The PLU designates this land exclusively under the prohibited zone to ensure safety, operational security, and compliance with defence regulations. The buffer has been carefully integrated into the plan to prevent incompatible land uses nearby. The area under the prohibited buffer zone is 120.07 hectares, making up 2.1% of the total area.

13.8.10 Green Belt

The Green Belt Zone has been preserved and modestly expanded to function as an ecological buffer between developed and non-developable areas. These zones help mitigate

urban heat, control unplanned expansion, and improve air quality. The PLU's emphasis on green belts reflects a strong commitment to sustainable development and environmental conservation. The green belt covers 17.33 hectares, constituting 0.3% of the total area.

13.8.11 Water Body

The PLU safeguards all natural water bodies as protected, non-developable areas. This measure supports natural drainage, flood control, and groundwater recharge. The delineation of these areas prevents encroachment and strengthens the region's environmental resilience. The total area under water bodies is 177.07 hectares, or 3.2% of the total area.

13.8.12 Forest Area

The forest zone has been conserved to maintain ecological integrity and biodiversity. These areas act as the region's green lungs, mitigating pollution and sustaining environmental balance. The proposed plan strictly prohibits construction or alteration within forest zones. The total area under forest cover is 209.40 hectares, representing 3.7% of the total area.

13.8.13 Hill Top-Hill Slope Zone

A hill top hill slope (HTHS) zone refers to the areas on and around hills that are subject to preserve the specific character by controlling the development on it and to prevent environmental damage and protect natural features. These zones often primarily include reserved forests/ afforestation areas on rolling terrains, valleys and dense forests, biodiversity parks (BDPs) etc. with increasing development pressure on any city, it is always such sensitive areas which suffers therefore control on development of such zones is very important, due to the concerns about loss of terrain & green cover, maintaining biodiversity & water sources and increased temperatures from construction activities.

It is always a matter of debate among developers and environmentalists about development permissibility in such sensitive areas especially when these areas are located near very premium locations having high land costs in any city. Developers wish to extract the potential of land within such areas whereas environmentalists wish to preserve the nature. it is very difficult for an urban planner in such cases to take a cautious and sustainable call.

In Pune due to its location being fairly near the Western Ghat region, the city is blessed with pleasant climate, moderate rainfall and mixed category terrain. There are hilly areas on north-west and south-west side of city. From the very beginning, the planning attempts were made to protect such sensitive hilly areas from overshadowing by the ever-expanding hunger of development of city itself. In earlier development plan of Pune city old limit sanctioned on Jan 05, 1987 there was proposal to have Hill slope- Hill top zone on such areas. this was indeed a development restricted zone, but with the increasing development thrust and demand of more land, these areas started developing in unplanned manner. The land subdivision and sales transactions increased the occupants and commuters in these natural areas. Slowly many hilltop and hill slope areas became unauthorized housing colonies and sometimes similar to slums.

The pace of development was rapid, by the time any remedial measures could have been taken, the additional 23 villages were merged within PMC on Sept 11, 1997. planning focus

was obviously turned towards the new fringe areas. To protect the similar sensitive areas in these villages and to restrict the unauthorized development in it, the new policy of proposing Bio diversity park as a reservation in development plan was proposed. The objective behind this was to acquire these lands and develop them as Bio Diversity Park (BDP) to preserve the natural character within it. The development plan for these 23 villages was sanctioned by govt. in stages from May 17, 2008 to Apr 04, 2012. The quantum of acquisition of such lands to develop as BDP was indeed very less due to several reasons including the financial priorities of authority and TDR policy for such lands.

Meanwhile the earlier DP sanctioned for old limit was under revision. The learning from both the assignments lead to propose the HTHS zone instead of BDP reservations. This revised DP was sanctioned by govt. on Jan 05, 2017.

In the planning area of nine villages, there is nearly 473.54 sq. m area under Hilltop & Hill slope or BDP character in the villages of Ambegaon Bk, Ambegaon Kh and Dhayari. Out of this area approximately 30% to 35% is under unauthorized development and structures. Major part of the structure comprises low-rise mixed-use buildings and bare minimum support infrastructure to them. There are also traces of some stone quarrying operations either idle or ongoing in the past. A special aerial survey is conducted through the expert agency, Graphias Solutions Private Limited for identification of real time situation of the said area. Based on that a slope analysis and actual terrain model is made to reconfirm the eligible zone character of the particular land parcels.

It is strategically very difficult to form any policy for regularization of this kind of development and structures as some of them are really violating not only just planning regulations but lacking in basic human safety also. It is evident to have a strong policy for redevelopment, reconstruction or relocation and rehabilitation of the citizens residing there. Different forms of urban planning tools can be combined and used to find a solution to this type of development.

The nature of development in the planning area is spatially adjoining and placed concentric around the old city area; therefore, it is easy to continue the parent policy to the extended limit. Similarly, as mentioned earlier some of the villages are split partially among the old limit and the extended limit. In view of this, the draft development plan proposed for these nine villages planning area, Hill top/ Hill slope zone (HTHS) similar to adjoining revised DP of old Pune city.

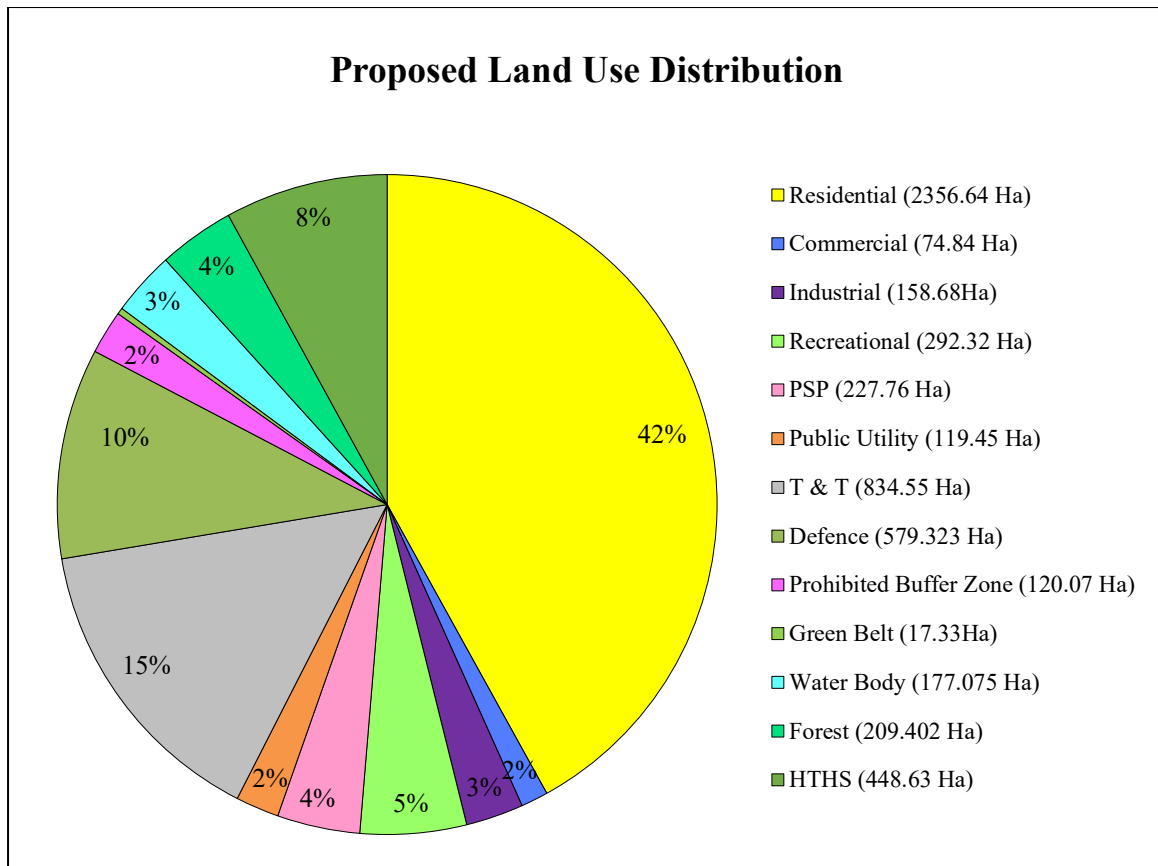
State govt. formed a committee to survey and document illegal constructions on Hilltops/ hill slopes and BDP areas within the city and to propose policy for development in such zones. This move comes amid growing concerns about the environmental impact and safety issues associated with unauthorized developments in these sensitive areas. The committee, comprising officials from the PMC, State Town Planning Department and the Forest Department.

The committee is supposed to complete its survey and submit a comprehensive report to govt. The survey will cover all hilltops and BDP zones within the city limits. The recommendations of the committee approved by govt. will be applicable to such identified areas within planning area of nine villages also.

Considering that the HTHS zone indicated in the Sanctioned Regional Plan is delineated at a broad scale, a detailed analysis using recent aerial survey data was undertaken. Based on the current terrain characteristics and the alignment of the proposed ring road, the extent of the HTHS zone in the PLU has been refined and reduced accordingly. The HTHS zone covers approximately 448.63 hectares, constitutes 8% of the total area.

Table 13.3 Proposed land use analysis

Sr. No.	Land Use	Total Area (in Ha)	% of Total Developed Area	% of Total Area
1	Residential	2356.64	49.6	42.0
2	Commercial	74.84	1.6	1.3
3	Industrial	158.68	3.3	2.8
4	Recreational	292.32	6.1	5.2
5	Public-Semi Public	227.76	4.7	4.1
6	Public Utility	119.45	2.5	2.1
7	Transportation	834.55	17.6	14.9
8	Defense	579.32	12.2	10.3
9	Prohibited Buffer Zone	120.07	2.4	2.1
A	Total Developable Area	4763.63	100	84.8
11	Green Belt	17.33		0.3
12	Waterbody	177.07		3.2
13	Forest	209.40		3.7
14	HTHS	448.63		8.0
B	Total Non-developable Area	852.43		15.2
C	Total Area (A+B)	5616.06		100



13.9 Development Control

The Government of Maharashtra, Urban Development Department, vide notification dated 2nd December 2020, sanctioned the Unified Development Control and Promotional Regulations (UDCPR) for all planning authority areas, excluding certain authorities. These regulations, as amended from time to time, shall be applicable to the Draft Development Plan published under Section 26 of the MR&TP Act, 1966, for the newly merged nine villages within Pune Municipal Corporation (PMC) limits. The land uses in the different zones described therein will be governed on the basis of the permissible uses defined for each respective zone. Further, the development of land and building activity on plots, along with their layouts, will also be regulated in accordance with the provisions of the sanctioned UDCPR and subsequent amendments. The UDCPR, prepared for the State of Maharashtra, represents a comprehensive set of reforms aimed at modernizing and rationalizing urban planning and development practices. These reforms focus on promoting sustainable growth, streamlining regulatory processes, and enhancing transparency and accountability in urban development.

13.10 Planning Norms Adopted

The provision of public amenities and social infrastructure in the Development Plan has been guided by established planning standards and norms prescribed by various agencies and regulations. The norms adopted by the Pune Municipal Corporation (PMC) have been finalized after a comparative assessment of standards recommended in the Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, the National Building Code (NBC), and the Government Circular No. TPS/3674/1877 &/UDS

dated 19.06.1979. These norms ensure an equitable and adequate distribution of essential facilities such as education, health, recreation, and utilities across the planning area.

Table 13.4 Planning norms adopted for social amenities

Sr. No.	Reservation	URDPFI	NBC	Govt. TPS/3674/1877 &/UDS DT 19/6/79	Norms Adopted by PMC
Educational					
1	Primary School 50:50 ratio to be considered for Public & Private Primary School	Expected No. of Primary School going children are 10% of Population For every 500 Students 1 Primary School Minimum Area required is 0.4 ha for 1 Primary School	Expected No. of Primary School going children are 15% of Population For every 5000 Students 1 Primary School Minimum Area required is 0.4 ha for 1 Primary School	Expected No. of Primary School going children are 15% of Population For every 400-500 Students 1 Primary School Minimum Area required is 0.001 ha for 1 Student	Expected No. of Primary School going children are 10% of Population For every 500 Students 1 Primary School Minimum Area required is 0.4 ha for 1 Primary School
2	High School 50:50 ratio to be considered for Public & Private Primary School	Expected No. of High School going children are 8% of Population For every 7,500 Population 1 Senior Secondary (VI-XII) Minimum Area required is 1.80 ha for 1 High School	Expected No. of High School going children are 10% of Population For every 7,500 Population 1 High School Minimum Area required is 1.80 ha for 1 High School	Expected No. of High School going children are 7.5% of Population For every 750 to 1000 Students 1 High School Minimum Area required is 0.0011 ha for 1 Student	Expected No. of High School going children are 10% of Population For every 1000 Students 1 High School Minimum Area required is 1.0 ha for 1 High School
Health					
3	Dispensary 50:50 ratio to be considered for Public & Private Dispensary	For every 15,000 Population 1 Dispensary Minimum Area required is 0.08 to 0.12 ha for 1 Dispensary	For every 15,000 Population 1 Dispensary Minimum Area required is 0.08 to 0.12 ha for 1 Dispensary	For every 10,000 Population 1 Dispensary and Maternity Home Minimum Area required is 0.25 ha for 1 Dispensary and Maternity Home	For every 15,000 Population 1 Primary Health Centre Minimum Area required in 0.06 to 0.12 ha for 1 Primary Health Centre

Sr. No.	Reservation	URDPFI	NBC	Govt. TPS/3674/1877 &/UDS DT 19/6/79	Norms Adopted by PMC
4	Maternity Home 50:50 ratio to be considered for Public & Private Hospital	For every 45,000 to 1,00,000 Population 1 Maternity Home Minimum Area required is 0.2 to 0.3 ha for 1 Maternity Home	For every 45,000 to 1,00,000 Population 1 Maternity Home Minimum Area required is 0.2 to 0.3 ha for 1 Maternity Home	For every 10,000 Population 1 Maternity Home and Dispensary Minimum Area required is 0.25 ha for 1 Maternity Home and Dispensary	For every 10,000 Population 1 Maternity Home Minimum Area required is 0.1 ha for 1 Maternity Home
5	Hospital 50:50 ratio to be considered for Public & Private Hospital	<u>General Hospital</u> For every 2,50,000 Population 1 Hospital of 500 Beds Minimum Area required is 4.00 ha or 1 Hospital	<u>General Hospital</u> For every 2,50,000 Population 1 Hospital of 500 Beds Minimum Area required is 4.00 ha for 1 Hospital	--	<u>Hospital</u> For every 1,00,000 Population 1 Hospital of 200 Beds Minimum Area required is 0.8 ha for 1 Hospital
Recreational					
6	Play Ground and Children Play Ground	For every 15,000 Population 1 Neighbourhood Play Area Minimum Area required is 1.5 ha for 1 Neighbourhood Play Area	For every 15,000 Population 1 Neighbourhood Play Area Minimum Area required is 1.5 ha for 1 Neighbourhood Play Area	For every 1,000 Population 1. Play Ground Minimum Area required is 0.4 ha for 1 or Play Ground	For every 15,000 Population 1 Neighbourhood Play Area Minimum Area required is 1.5 ha for 1 Neighbourhood Play Area
7	Garden, Nala Garden, Park, Sponge Garden	For every 15,000 Population 1 Neighbourhood Park Minimum Area required is 1.0 ha for 1 Neighbourhood Park		For every 1,000 Population 1 Garden or Park Minimum Area required is 0.2 ha for 1 Garden	For every 15,000 Population 1 Neighbourhood Play Area Minimum Area required is 1 ha for 1 Neighbourhood Play Area

Sr. No.	Reservation	URDPFI	NBC	Govt. TPS/3674/1877 &/UDS DT 19/6/79	Norms Adopted by PMC
8	Multi-Purpose Ground	For every 1,00,000 Population 1 Community Level Multi-Purpose Ground Minimum Area required is 2.00 ha for 1 Community Level Multi-Purpose Ground	For every 1,00,000 Population 1 Community Level Multi-Purpose Ground Minimum Area required is 2.00 ha for 1 Community Level Multi-Purpose Ground		For every 1,00,000 Population 1 Community Level Multi-Purpose Ground Minimum Area required is 2.00 ha for 1 Community Level Multi-Purpose Ground
Public Utility					
9	Cremation	For every 5,00,000 Population 1 Cremation Minimum Area required is 2.5 ha for 1 Cremation	For every 5,00,000 Population 1 Cremation Minimum Area required is 2.5 ha for 1 Cremation		For every 1,00,000 Population 1 Cremation Minimum Area required is 0.5 ha for 1 Cremation

13.11 Provision of Social Amenities

To ensure the orderly and sustainable development of the nine villages under Pune Municipal Corporation, the Development Plan focuses on appropriate land use zoning, transportation networks, and development control measures. The plan also aims to create an environment where residents can enjoy a high standard of living by reserving land for essential social, civic, and public amenities.

Land reservations are planned within the financial and operational capacity of the Planning Authority, ensuring that acquisition can be completed within ten years in accordance with Section 31(5) of the MR&TP Act. Emphasis is placed not only on the creation but also on the effective maintenance and utilization of these amenities, which include educational institutions, healthcare facilities, public utilities, recreational spaces, and transportation infrastructure.

Provisions are made to balance public needs with private interests, ensuring equitable access to amenities while minimizing conflicts with landowners. This approach facilitates inclusive, sustainable, and well-coordinated growth across the nine villages.

13.11.1 Education

In the Proposed Land Use, adequate land has been reserved for educational facilities at primary, secondary, and higher levels, ensuring balanced access across the planning area.

Sites are also earmarked for vocational training institutes to cater to diverse educational needs. These facilities are strategically located within or near residential clusters for easy accessibility.

13.11.2 Health

To strengthen healthcare services in the nine villages, the PLU proposes reservations for hospitals, dispensaries, maternity homes, rehabilitation centers, trauma care centres, urban health centres and special care centres. These are distributed strategically to provide equitable access and ensure timely response in case of emergencies. The plan also supports integration of public and private health infrastructure, allowing efficient healthcare delivery. Provisions for shared or multiple use of health facilities are included to maximize land efficiency while safeguarding the primary function.

13.11.3 Recreational and Cultural Amenities

Recreational spaces form an important component of the PLU. Reservations are made for gardens, parks, children's playground, playgrounds and sports centers within neighborhoods to ensure residents have access to open spaces. In addition, cultural halls, community centers, exhibition center and libraries are proposed to promote social interaction, cultural activities, and knowledge-based engagement. These amenities are distributed across the planning area to achieve balanced development and inclusive community growth.

13.12 Public Utilities and Services

The Proposed Land Use (PLU) reserves adequate land for essential public and semi-public utilities, ensuring that the nine villages are integrated with the larger urban framework of Pune.

- **Water Tank:** Land reserved near lakes and natural bodies for pumping stations and storage facilities to ensure reliable supply.
- **Sewerage Works:** Sites earmarked for STPs, pumping stations, and networks to strengthen sanitation.
- **Garbage Processing Plants:** Land allocated for segregation, processing plants, and transfer stations at strategic locations.
- **Fire Brigade & Disaster Management:** Provisions for fire stations and disaster management centers for improved response.
- **Post Offices:** Sites reserved for postal and allied communication facilities.
- **Police Stations & Chowkis:** Strategic reservations to enhance safety, law enforcement, and quick emergency response.
- **Electricity & Power Supply:** Integration of MSEDCL sub-stations, transformer yards, and distribution facilities for uninterrupted power.
- **Public convenience centers** are proposed at strategic locations to improve hygiene and public comfort.
- **Other Public Services:** Land earmarked for community centers, municipal purpose, municipal offices and government service offices.

13.13 Transportation

The transportation land use in the PLU is designed to support seamless connectivity, efficient logistics, and sustainable mobility.

- **Road Network:** A hierarchy of arterial, sub-arterial, collector, and local roads is proposed with provisions for pedestrian pathways and cycle tracks, ensuring complete street design and multi-modal integration.
- **Bus Depots and Terminals:** Land is reserved for bus depots and terminals at strategic locations to strengthen public transport operations and improve connectivity within the villages and to the core city.
- **Truck Terminals:** Dedicated truck terminals are proposed to streamline goods movement, reduce traffic conflicts with passenger vehicles, and support regional trade and logistics.
- **Parking Facilities:** Adequate parking spaces are identified near activity nodes, commercial centers, and transport hubs to manage vehicular demand and reduce roadside congestion.

13.14 Public Housing

The Development Plan emphasizes the provision of adequate, affordable, and inclusive housing to meet the needs of all income and social groups within the nine villages under Pune Municipal Corporation. Land has been reserved for Public Housing, Municipal Housing, Housing for the Dishoused, and Working Women's Hostels to promote equitable access to shelter and support sustainable community growth.

Public Housing will cater to economically weaker and low-income groups through schemes implemented by PMC, MHADA, or other agencies, ensuring access to essential services such as roads, water supply, sanitation, and open spaces. Municipal Housing is proposed for essential service staff including health, sanitation, and fire brigade personnel, located near their workplaces to improve efficiency and welfare. Housing for the Dishoused will provide secure and affordable rehabilitation for families displaced by development or infrastructure projects, ensuring continuity of community and livelihood. Working Women's Hostels are planned near employment and educational centers to offer safe, affordable, and well-managed accommodation with supporting facilities.

Together, these housing provisions aim to create inclusive, well-serviced, and sustainable neighbourhoods, ensuring that all residents benefit from improved living conditions and balanced urban development across the nine villages.

[Annexure 2](#) provides sector-wise details of the required, existing, and proposed public amenities, i.e., reservations.

[Annexure 3](#) presents the sector-wise list of amenity reservations along with their respective acquisition and development costs.

CHAPTER 14 : THE SPONGE CITY CONCEPT

14.1 Introduction

A Sponge City Garden is a sustainable landscape feature designed to absorb, filter, and store rainwater runoff through the use of specialized techniques and vegetation. Instead of channelling stormwater rapidly into the sewer system, it slows the flow, allowing water to seep into the ground, replenish groundwater, and reduce urban flooding.

This idea forms a core element of the broader “Sponge City” urban development concept, an innovative approach to urban planning that addresses key challenges such as flash flooding, water scarcity, and the urban heat island effect by mimicking the natural water cycle. Unlike conventional “grey” infrastructure (pipes, drains, and concrete channels) that simply convey stormwater away, a Sponge City integrates “green” and “blue” infrastructure- including permeable surfaces, green roofs, wetlands, and sponge city gardens- to absorb, store, purify, and reuse rainwater at its source.

By treating the city as a living, resilient ecosystem, this approach transforms impermeable urban areas into systems capable of capturing and managing rainfall, recharging groundwater, reducing runoff, and mitigating flood risks, while also enhancing overall urban resilience and ecological health.

14.2 Core Components

The Sponge City Garden and Green Infrastructure Component Description/ Primary Function

- i) **Rain Gardens:** - Shallow, vegetated depressions designed to collect and filter storm water runoff from impervious surfaces. They feature native, water-tolerant plants. Absorb and Filter runoff; promote infiltration.
- ii) **Permeable Pavement:** - Paving materials (e.g., permeable concrete, porous asphalt, or paver blocks) that allow water to seep through into an underlying stone reservoir and eventually into the ground. Infiltrate water and reduce surface runoff.
- iii) **Green Roofs:** - Vegetated layers on building rooftops that capture and retain rainfall, significantly reducing the volume and speed of rooftop runoff. Retain water; reduce urban heat island effect.
- iv) **Bio swales/ Grass Swales:** - Vegetated, shallow channels designed to slow and convey storm water runoff while allowing water to infiltrate and filtering pollutants. Slow and Convey water; promote infiltration and filtration.
- v) **Urban Wetlands/Ponds:** - Constructed or restored natural water bodies that function as reservoirs to store excess storm water, filter pollutants, and enhance biodiversity. Store and purify large volumes of water.
- vi) **Floodable Parks:** - Public Park spaces strategically designed with topographical features to safely hold and temporarily store large volumes of water during extreme rainfall events.

14.3 Benefits of the Sponge City Approach

The implementation of sponge city garden concepts delivers a wide array of environmental, social, and economic advantages:

- i) **Flood Mitigation:** - Significantly reduces surface runoff and peak flow rates, lessening the frequency and severity of urban flooding.
- ii) **Water Resource Management:** - Promotes groundwater recharge and allows for rainwater harvesting and reuse (e.g., for irrigation or non-potable domestic use), reducing reliance on municipal water sources.
- iii) **Water Quality Improvement:** - Green infrastructure acts as a natural filter, removing pollutants (like heavy metals, sediment, and nutrients) from stormwater runoff, reducing the burden on water treatment systems.
- iv) **Urban Climate Regulation:** - Increased green spaces and evapotranspiration from vegetation reduce the urban heat island effect, leading to lower air temperatures.
- v) **Biodiversity Enhancement:** - Provides new and improved habitats for flora and fauna, fostering healthier urban ecosystems.
- vi) **Aesthetic and Social Value:** - Transforms utilitarian drainage areas into attractive, multi-functional green spaces that serve as recreational areas for the community.

14.4 Conclusion

The Sponge City Garden concept is fundamental to sustainable and resilient urban development. It represents a necessary shift from fighting water with concrete to working with nature using green infrastructure. By integrating elements like rain gardens, permeable pavements, and floodable parks, cities can effectively manage storm water runoff, mitigate the risks of climate change-induced flooding, conserve water resources, and significantly enhance overall urban livability and ecological health. The successful implementations globally demonstrate that this holistic, nature-based approach is not only environmentally sound but also economically viable for building the climate-resilient cities of the future.

14.5 Proposals in the planning area

Within the planning area comprising nine villages, there are limited opportunities to identify and enhance elements of green infrastructure. The area is largely non-contiguous and exhibits a distorted settlement pattern. The terrain varies considerably, from the southern parts to the northeastern portion of the city. Frequent flooding issues are observed in villages such as Shivane, Dhayari, and Ambegaon, which are river-borne or influenced by natural topography. In contrast, other villages like Undri, Lohegaon, and Mundhwa–Hadapsar experience flooding primarily due to obstructions in surface drainage systems and inadequate stormwater management arrangements. A combined and sustainable solution is proposed in the form of sponge gardens at strategically located low-lying areas. These green infrastructure interventions are intended to enable the land to store, recharge, and reuse surface water, which would otherwise be lost as runoff. The Draft Development Plan includes proposals for sponge gardens at three locations in Lohegaon and one in Undri. The development of these reservations shall include one or more components of sponge gardens as appropriate to the site-specific conditions and hydrological characteristics of each location.

CHAPTER 15 : IMPLEMENTATION OF DEVELOPMENT PLAN

Introduction

A Development Plan (DP) is a key instrument for guiding the growth of a city or town in a planned, sustainable, and equitable manner. The effectiveness of such a plan lies not only in its preparation but also in its timely and systematic implementation. The Maharashtra Regional and Town Planning (MR&TP) Act, 1966 mandates that Development Plan proposals must be implemented within a horizon period of twenty years from the date the plan comes into effect.

The Development Plan prepared for the extended limit nine villages of Pune Municipal Corporation (PMC) covers the period 2025-2045, with a horizon year of 2045. It accounts for projected population growth, land use requirements, mobility and transport needs, and provision of public and social amenities. To achieve balanced and integrated development, coordinated implementation by the planning authority, along with support from related agencies, is essential.

Land remains the most critical resource in urban planning. Rising land values and high compensation liabilities often create difficulties for local authorities in acquiring land for roads, open spaces, and civic amenities. Conventional methods of acquisition demand substantial financial outlay, which most urban local bodies find difficult to mobilize. For this reason, innovative mechanisms such as Town Planning Schemes (TPS), Accommodation Reservation (AR), and Transferable Development Rights (TDR), as provided under the Unified Development Control and Promotion Regulations (UDCPR), must be prioritized as more efficient and cost-effective alternatives to traditional land procurement.

For the Development Plan to be successfully implemented, it must also be financially sustainable. Increasingly, urban land is being treated as a resource to generate funds for infrastructure development. Approaches such as betterment charges, premium FSI, development cess, and public-private partnerships can reduce dependence on municipal budgets and ensure steady financing. The UDCPR has integrated several of these methods and incentives to facilitate land acquisition and effective execution of Development Plan proposals.

15.1 Implementation Mechanisms

15.1.1 Through Town Planning Schemes (TPS)

Town Planning Schemes are one of the most effective instruments for implementing Development Plan proposals under the MR&TP Act, 1966. In this system, privately owned land parcels are pooled, deductions are made for reservations, amenities, and infrastructure, and the remaining land is redistributed as reconstituted final plots. Lands reserved for public purposes vest with the Planning Authority free of encumbrances once the scheme is sanctioned. The costs of land acquisition and infrastructure are shared among landowners in proportion to the appreciation in land value. TPS ensures faster possession of sites for

amenities and roads, reduces the financial burden on the authority, and avoids lengthy acquisition procedure.

15.1.2 Through Accommodation Reservation (AR)

Accommodation Reservation is another tool that enables the provision of amenities without direct municipal expenditure. Under this approach, the landowner develops the reserved site as per the authority's requirements and hands over the constructed amenity free of cost. In return, the landowner retains the full development potential (FSI) of the remaining plot. This mechanism guarantees timely provision of civic amenities while allowing landowners to benefit from permissible built-up potential. Provisions under UDCPR make AR more attractive and flexible, thereby encouraging cooperation between landowners and the authority.

15.1.3 In lieu of Transferable Development Rights (TDR)

TDR provides a non-monetary compensation method for acquiring land required for public purposes. Landowners surrender their land in exchange for Development Right Certificates (DRCs), which entitle them to additional built-up potential. These rights can be used on designated receiving plots or transferred within the Corporation's jurisdiction. TDR minimizes reliance on monetary compensation, reduces fiscal pressure on the municipal budget, and promotes quicker execution of DP proposals. It also provides flexibility and transparency in land procurement while ensuring timely development of public infrastructure and amenities.

15.1.4 Urban Renewal Scheme (URS)

URS is defined under Regulation 14.8 of the UDCPR. A URS is a redevelopment scheme of a cluster or clusters of buildings / structures in a municipal corporation area. This scheme emphasizes the revitalization and optimization of existing urban areas while accommodating future growth in a balanced manner.

The focus is on upgrading aging infrastructure, improving connectivity, enhancing public amenities, and promoting efficient land use through redevelopment, reorganization, and infrastructure augmentation. Under this framework, priority is given to integrating new development proposals with existing built environments, ensuring minimal disruption to current settlements while improving overall urban functionality. Environmental sustainability and resilience are central to the Urban Renewal Scheme, with measures such as green infrastructure, energy-efficient design, and climate-responsive planning embedded into all development initiatives. Institutional mechanisms will emphasize public-private partnerships (PPP), community participation, and inter-agency coordination to ensure transparent, efficient, and accountable implementation.

In essence, the Urban Renewal Scheme serves as a key instrument for translating the Development Plan's vision into action—harmonizing urban expansion with renewal, improving quality of life, and building a modern, inclusive, and resilient city.

15.1.5 Through Monetary Acquisition

In cases where TPS, AR, or TDR cannot be applied, land may be acquired under the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR). This method ensures legal certainty and provides clear ownership of land to the authority. However, it is financially demanding and should be adopted only in urgent situations or when no other mechanism is feasible.

15.2 Need for Monitoring

A well-structured monitoring mechanism is essential to ensure timely and coordinated implementation of the Development Plan. At present, responsibilities are divided among different wings of the Corporation such as Town Planning, Engineering, Land Acquisition, and Finance, which often makes it difficult to maintain a consolidated view of progress and fund utilization.

For the newly merged areas, where development needs are both urgent and large in scale, a dedicated monitoring cell should be established. This cell would centralize oversight, streamline inter-departmental coordination, and prepare regular progress reports. It would also help in identifying delays, reallocating resources, and setting priorities. Such a system would improve efficiency, accountability, and transparency in implementation while ensuring better quality of life for residents.

15.3 Programming

The implementation of Development Plan proposals must be phased across the horizon period 2025-2045. In the initial years, priority will be given to critical road networks, water supply, drainage systems, and essential public amenities to support immediate urbanization pressures. In the medium term, attention will shift towards strengthening social infrastructure such as schools, hospitals, markets, and recreational facilities.

Towards the later part of the horizon, remaining reservations, large-scale infrastructure, and upgrading of community-level services will be taken up. This phased approach ensures systematic growth and balanced development, while also allowing for flexibility. The Municipal Commissioner will have the authority to adjust priorities depending on emerging needs, financial resources, and unforeseen requirements.

15.4 Conclusion

The successful implementation of the Development Plan for the newly merged villages of PMC hinges on the adoption of innovative land management tools, sustainable financing strategies, and strong institutional coordination. Instruments such as Town Planning Schemes, Accommodation Reservation, and Transferable Development Rights provide practical, cost-effective alternatives to conventional acquisition, while also ensuring that civic amenities and infrastructure are delivered in a timely manner. Where unavoidable, monetary acquisition may serve as a complementary option.

A key strength of this Development Plan is that it has been entirely prepared and spatially analysed using Geographic Information System (GIS) technology. This digital, data-driven approach ensures accuracy in spatial planning, enhances decision-making, and facilitates effective monitoring and implementation. The integration of GIS enables dynamic

mapping, real-time data management, and transparency in land use planning-making the DP both adaptive and responsive to emerging urban challenges.

By combining financial sustainability, regulatory mechanisms under UDCPR, GIS-based planning, and phased development strategies, the DP provides a clear roadmap to guide urbanization in an orderly and equitable manner.

Effective implementation will not only meet the immediate needs of the merged villages but also lay the foundation for a resilient, inclusive, and well-integrated urban environment for Pune up to the horizon year 2045.



Am
(Abhijit Ketkar)

Officer Appointed U/s 21(4A)
Draft Development Plan of
Pune Municipal Corporation
(Extended Limit 09 Villages)

&

Assistant Director of Town Planning,
Pune Branch, Pune

CHAPTER 16 : COSTING, PHASING AND FEASIBILITY ANALYSIS

A Development Plan (DP) presents proposals related to land use zoning, reservations for public amenities, and infrastructure in order to address the needs of citizens over a 20-year planning horizon. For the DP of the nine newly merged villages, the planning horizon is set for the year 2045, taking into account the five-year period of plan preparation beginning from the declaration of intention dated 4th October 2018, as mandated under the 74th Constitutional Amendment Act (CAA). As per Section 127 of the Maharashtra Regional and Town Planning (MR&TP) Act, 1966, if the designated land is not acquired within ten years from the date on which the final DP comes into effect. The landowner may serve a notice on the planning authority or the appropriate authority to purchase the land. If, within two years after the receipt of such notice, no notification for the acquisition of the land is published, the designation or reservation of the land shall lapse. This provision highlights the importance of timely implementation of DP proposals. Accordingly, reservations have been proposed on the basis of the projected population for the year 2035, aligning with the 10-year implementation period, while proposals related to land use zoning, road networks, and utility infrastructure have been planned considering the projected population of 2045, consistent with the overall 20-year planning horizon.

Land, finance, and manpower form the three fundamental resources required for the successful execution of the Development Plan. The allocation of these resources must be undertaken in a manner that promotes efficiency, equity, and inclusiveness. Timely acquisition and development of land for the purposes designated in the DP are critical for achieving its objectives. Furthermore, accurate costing, detailed feasibility assessments, and phased implementation strategies provide a structured framework for ensuring the practicality and effectiveness of the Development Plan.

16.1 Costing of Development Plan Implementation

Capital investment for the implementation of the Development Plan includes land acquisition cost, development cost, and operation and maintenance (O&M) cost. The funding for O&M can generally be managed through the revenue generated from the infrastructure projects once they are implemented, and hence it may not be considered as part of the initial capital requirement. The land acquisition cost, particularly for land under reservation proposals, constitutes a significant portion of the overall cost of DP implementation. Acquisition is carried out in accordance with the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013). Apart from land acquisition, the development costs associated with various proposals of the Development Plan also need to be taken into consideration.

16.1.1 Considerations made for costing of the Development Plan

Considering the continuously increasing land prices, rising development costs, and the limited financial capacity of Urban Local Bodies (ULBs), innovative tools for Development Plan (DP) implementation are being adopted. To minimize the substantial financial burden of acquiring land through direct monetary compensation, alternative mechanisms such as the grant of additional Floor Space Index (FSI), Transferable

Development Rights (TDR), and Reservation Credit Certificates (RCC), as provided under the UDCPR 2020, are being utilized. These instruments not only reduce immediate financial outflow but also create flexible options for land acquisition and development. Accordingly, such mechanisms are factored into the overall assessment of the “Cost of Implementation of the Development Plan”.

i) Land Acquisition Cost

The cost of land acquisition has been calculated on the basis of the Ready Reckoner rates for the year 2023-24, while the cost of development has been estimated as per the State Schedule of Rates (SOR) for the year 2023-24. Proposals located on government lands and on amenity spaces in sanctioned layouts will not require acquisition costs, as only development costs will be incurred. Similarly, no acquisition cost will be borne by PMC for reservations where the implementing authority is other than PMC. The scope of tools such as Accommodation Reservation, grant of additional FSI, Transferable Development Rights (TDR), and Reservation Credit Certificates (RCC) has been expanded under UDCPR 2020. Based on these provisions and past implementation experience, no acquisition cost is considered for 50 percent of reservations to be developed through Accommodation Reservation, 35 percent through TDR, and 5 percent through RCC. Furthermore, it is assumed that 75 percent of the land under proposed roads will be handed over to PMC in lieu of FSI, 15 percent in lieu of TDR, and 5 percent in lieu of RCC. Taking these considerations into account, the net cost to PMC for acquisition of land under reservations amounts to approximately ₹287 crore, while the acquisition cost for roads is estimated at around ₹753 crore.

ii) Development Cost

The development cost for reservations, except those assigned to implementing authorities other than PMC, has been taken into account. No development cost is considered for accommodation reservations, which constitute 50 percent of the total reservations, with the exception of recreational reservations developed through the accommodation reservation mechanism, for which 70 percent of the development cost is required to be borne by PMC. The development cost for all proposed roads has been included, except for those under the jurisdiction of other implementing agencies such as National Highways and State Highways. Based on these considerations, the estimated development cost to PMC amounts to approximately ₹1,881 crore for reservations and ₹2,387 crore for roads.

The summary of considerations for costing of DP implementation for reservations and roads are as follows-

Table 16.1 Development of DP reservations by various modes

Sr No	Reservation Type	Accommodation Reservation	TDR & RCC	Land acquisition	Dev Cost
1	Commercial	50%	40%	10%	50%
2	Educational & Health	50%	40%	10%	50%
3	Recreational-	50%	40%	10%	50%
3a	G, PK, PG, CPG	50%	40%	10%	85%
3b	Nalla Garden, US, UF	0%	0%	100%	100%

4	Residential-				
4a	PH	50%	40%	10%	50%
4b	MUH	0%	0%	100%	100%
5	Public Utilities	0%	0%	100%	100%
6	Public Facilities-				
6a	FB&DM, MP, MO	0%	0%	100%	100%
6b	WWH, LIB, SCC, CH, PCC, CTH	50%	40%	10%	50%
7	Traffic & Transportation	50%	40%	10%	50%

Table 16.2 Development of roads by various modes

Sr No	Road Type	Acquisition In Lieu of FSI	TDR & RCC	Land Acqn. Cost	Dev. Cost
1	D P Roads	75%	20%	5%	100%
2	National Highway, MDR, ODR	0%	0%	0%	0%
3	State Highway	75%	20%	5%	100%
4	Service Roads	75%	20%	5%	100%

16.1.2 Details of Costing

The components of cost for DP implementation to be borne by PMC are land cost and development cost for various DP proposals as follows.

Table 16.3 Estimated cost of various components

Sr No	Components	Area in Ha	Estimated Cost in ₹ (Cr)
1	Land Acquisition Cost		
A	Cost of Acquisition of reservations	374.64	287
B	Cost of Acquisition of Roads	597	753
2	Development cost		
A	Cost of development of reservations		1881
B	Cost of development of Roads		2387
	TOTAL	971.64	5308

Details of the estimated total cost for DP implementation through various modes.

Table 16.4 Amenities implementation cost

Sectors	Area of Unit (Ha)	Developable Area (Ha)	No of Resrn	Total Area of Resrn (Ha)	Total Land Cost of Resrn (Cr ₹)	Land Cost exclud AS, Gvt land, etc. Cr ₹	Acco Resr 50%	RCC 5%	TDR 35%	Land Acqn 10%	Land Cost to PMC (Cr ₹)	Total Dev Cost (Cr ₹)	Dev Cost To PMC (Cr ₹)	Total Cost (Cr ₹)
1	1979	1905	175	180.86	4690	1679	840	84	588	168	168	2065	1091	1259
2	467	432	80	38.47	2398	419	209	21	147	42	42	437	127	169
3	326	314	48	15.16	1640	111	55	6	39	11	11	352	81	92
4	434	427	88	34.10	584	162	81	8	57	16	16	402	96	112
5 & 6	624	367	105	25.10	531	161	80	8	56	16	16	280	826	98
7	942	484	89	55.87	720.1	235	118	12	82	24	24	478	251	275
8	779	177	34	25.04	421	98	49	5	34	10	10	250	153	163
Total	5551	4106	619	374.64	10984	2865	1432	144	1003	287	287	4264	1881	2168

Table 16.5 Road implementation cost

Sectors	Area of Unit (Ha)	Developable Area	No of Roads	Total Area of Roads/Rd Wdng (Ha)	Total Land Cost in (Cr ₹)	In lieu of Addl FSI 75%	RCC 5%	TDR 15%	Land Acqn 5%	Land Cost To PMC (Cr ₹)	Dev Cost in (Cr ₹)	Total Cost in (Cr ₹)
1	1979	1905	83	231	5360	4020	268	804	268	268	924	1191
2	467	432	45	72	4118	3089	206	618	206	206	286	492
3	326	314	26	31	1356	1017	68	2038	68	68	125	193
4	434	427	46	67	1170	878	59	176	59	59	269	327
5 & 6	624	367	64	71	1306	9798	65	196	65	65	285	351
7	942	484	36	89	1164	873	58	175	58	58	356	415
8	779	177	31	36	573	429	29	86	29	29	142	171
Total	5551	4106	331	597	15047	20104	753	4093	753	753	2387	3140

Total Implementation cost of Amenities and Roads is ₹ 5308 Crores

16.2 Phasing of Development of DP Proposals

The proposals are required to be developed in a phased manner, taking into account the following considerations for implementation during the 10-year period, up to the year 2035:

- Projected population growth and the existing status of facilities in all units of the planning area.
- Needs and demands of citizens and stakeholders
- Priority and urgency for the development of specific amenities.
- Estimated availability of land and financial resources.

Phasing Programme

For the phasing of proposals within the 10-year implementation period, three phases are considered: an initial phase of four years, followed by two subsequent phases of three years each. The priorities identified by the Authority at this stage cannot be treated as rigid, as evaluation at the end of each phase will help in revising and redefining the targets for the succeeding phases. The identification of amenities for acquisition and development will therefore be undertaken progressively, based on the urgency of requirements and the priorities emerging from the evolving urban scenario. At the same time, major infrastructural projects designed to cater to the projected population of the year 2045 or beyond, and implemented as part of any specific scheme, may follow a separate implementation schedule. Such projects will be monitored independently to ensure timely and appropriate execution in line with long-term development needs.

16.2.1 Implementation Phases of Reservations

Table 16.6 Phase-I (4 Years)

Sr. No	Reservations	No	Area Ha	Land Cost to PMC (₹ in cr)	Dev Cost (₹ in cr)	Total Cost to PMC (₹ in cr)
1	Commercial	15	3.23	2.94	22.79	25.73
2	Education	34	24.35	19.51	305.10	324.61
3	Health	47	22.72	15.59	296.43	312.01
4	Recreational	45	25.63	36.01	52.10	88.11
5	Residential	6	5.65	0.76	88.97	89.72
6	Public Utilities	38	31.24	179.95	403.32	583.28
7	Public Facilities	65	12.01	22.93	280.38	303.31
8	Traffic & Transportation	16	12.44	41.63	34.86	76.49
	Total	266	137.27	319.32	1483.95	1803.27

Table 16.7 Phase-II (3 Years)

Sr. No	Reservations	No	Area Ha	Land Cost to PMC (₹ in cr)	Dev Cost (₹ in cr)	Total Cost to PMC (₹ in cr)
1	Commercial	14	3.54	4.89	27.06	31.94
2	Education	23	24.65	21.65	261.71	283.36
3	Health	13	3.66	1.98	48.72	50.70
4	Recreational	166	112.33	181.72	156.58	338.29
5	Residential	4	17.17	8.12	255.66	263.78
6	Public Utilities	17	15.65	149.88	166.38	316.25
7	Public Facilities	64	10.54	3.72	202.10	205.82
8	Traffic & Transportation	18	12.07	44.67	54.61	99.29
	Total	319	199.61	416.62	1172.81	1589.43

Table 16.8 Phase-III (3 Years)

Sr. No	Reservations	No	Area Ha	Land Cost To PMC (₹ in cr)	Dev Cost (₹ in cr)	Total Cost to PMC (₹ in cr)
1	Commercial	15	13.45	4.72	51.94	56.67
2	Education	4	1.52	2.44	20.27	22.71
3	Health	2	0.69	0.59	9.24	9.83
4	Recreational	109	129.56	179.90	172.91	352.81
5	Residential	12	25.54	17.14	378.36	395.50
6	Public Utilities	8	5.94	37.46	51.45	88.91
7	Public Facilities	51	9.38	31.05	186.78	217.82
8	Traffic & Transportation	11	4.31	37.59	15.43	53.02
	Total	212	190.39	310.89	886.37	1197.26

Table 16.9 Phase-(I+II+III)(10years)

Sr. No	Reservations	No	Area Ha	Land Cost to PMC (₹ cr)	Dev Cost (₹ cr)	Total Cost to PMC (₹ cr)
1	Commercial	44	20.22	12.55	101.80	114.34
2	Education	61	50.53	43.60	587.08	630.67
3	Health	62	27.07	18.16	354.38	372.54
4	Recreational	320	267.52	397.63	381.58	779.22
5	Residential	22	48.35	26.02	722.99	749.00
6	Public Utilities	63	52.83	367.29	621.15	988.44
7	Public Facilities	180	31.93	57.70	669.26	726.96
8	Traffic & Transportation	45	28.82	123.90	104.90	228.79
	Total	797	527.26	1046.83	3543.13	4589.96

16.2.2 Implementation Phases of Roads

Table 16.10 Phase -I (4 Years)

Types Of Roads	No	Area (Ha)	Land Cost 5% (₹cr.)	Dev Cost (₹cr.)	Total Cost (₹cr.)
DP Roads	87	152.74	110.44	610.97	721.41
NH	1	0.00	0	0	0
SH	4	0.81	0.50	3.24	3.75
MDR	3	17.92	8.39	71.67	80.06
ODR	0	0.00	0	0	0
SR	6	10.59	6.19	42.35	48.54
TOTAL	101	182.06	125.52	728.23	853.75

Table 16.11 Phase-II (3 Years)

Types of Roads	No	Area (ha)	Land Cost 5% (₹ in Cr)	Dev Cost 5% (₹ in Cr)	Total Cost (₹ in Cr)
DP Roads	115	191.80	111.53	767.21	878.74
NH	0	0.00	0	0	0
SH	1	0.81	0.50	3.24	3.75

MDR	2	4.11	5.46	16.43	21.89
ODR	0	0.00	0	0	0
SR	1	9.98	4.98	39.91	44.89
TOTAL	119	206.70	122.48	826.79	949.27

Table 16.12 Phase- III (3 Years)

Types Of Roads	No	Area (Ha)	Land Cost 5% (₹cr.)	Dev Cost (₹cr.)	Total Cost (₹cr.)
DP Roads	170	172.30	123.35	689.20	812.55
NH	2	0.00	0	0	0
SH	0	0.00	0	0	0
MDR	0	0.00	0	0	0
ODR	0	0.00	0	0	0
SR	0	0.00	0	0	0
TOTAL	172	172.30	123.35	689.20	812.55

Table 16.13 Phase (I+II+III) (10 Years)

Types of Roads	No	Area (ha)	Land Cost 5% (₹ in Cr)	Dev Cost 5% (₹ in Cr)	Total Cost (₹ in Cr)
DP Roads	372	516.84	345	2067.37	2412.70
NH	3	0	0	0	0
SH	5	1.62	1	6.49	7.49
MDR	5	22.02	13.86	88.10	101.96
ODR	0	0	0	0	0
SR	7	20.57	11.16	82.26	93.42
TOTAL	392	561.05	371.35	2244.22	2615.57

16.3 Financial Feasibility Analysis of the Implementation of the Development Plan

The feasibility analysis of proposed projects involves assessing their practicability, the availability of resources, and the financial capacity of the implementing authority. A detailed fiscal feasibility assessment helps in identifying, determining, and mobilizing the required financial resources to ensure successful implementation.

While drafting the proposals in the Development Plan, essential physical aspects such as location, geographic conditions, accessibility, altitude, and distribution of land use were evaluated in relation to the nature of each proposal. In addition, socio-economic considerations, cost-effectiveness, and overall suitability were given prime importance. As

outlined earlier, the estimated total cost of implementing the Development Plan for PMC amounts to ₹5,308 crore, taking into account various mechanisms such as Accommodation Reservation, Transferable Development Rights (TDR), and Reservation Credit Certificates (RCC). Considering the limited availability of funds for development projects across the entire city, ensuring adequate annual budget allocations for the implementation of the DP in the newly merged nine villages is undoubtedly challenging, though not unachievable. To achieve the objectives of the Plan, it is essential to guarantee timely and uninterrupted availability of funds at every stage of the phase-wise implementation process.

The major sources of income for PMC include development charges, premium charges, municipal taxes, and PMC's share in GST, which together can be collectively referred to as the Development Fund. In addition, Central and State Government grants, specific project-based funding, and allocations under the District Planning and Development Committee (DPDC) constitute other important sources of revenue. Apart from grants and DPDC funding earmarked for specific projects, the funds available from PMC's Development Fund for implementation of the Development Plan are estimated at around ₹245 crore annually. Over a 10-year period, this translates to approximately ₹2,450 crore, which forms a critical component for ensuring the financial feasibility of the Plan. The detailed analogy and practicability of this funding framework are discussed in the subsequent chapter on the implementation strategy of the Development Plan. A brief outline of the proposed allocation of funds is presented in the following table.

Table 16.14 Proposed allocation of funds for DP implementation in next 10 years

Sr. no	Source	Amount ₹ Cr
1	Projected Development Fund (including Development Charges, Premiums, fees, Property Tax & PMC's share of GST) at 16.5% with increase of 15% p a	2450
2	Development Charges collected by PMRDA in 11 villages	300
3	Govt Funding for Infrastructure/development/National priority Projects (85 % of development cost)	1290
4	Grant in Aid by State Govt	1609
5	Grant in Aid by Central Govt	2000
	Total	7649

Note: The above-mentioned information has been provided by the PMC.

Thus, it can be concluded that to ensure financial feasibility and to meet the fiscal requirements for the efficient implementation of the Development Plan, it is necessary not only to rely on regular municipal financial resources but also to explore additional avenues of funding.

Annexure 1: Deviation from Sanctioned Regional Plan

Village	Sr. No.	Survey No.	Sanctioned RP	Draft DP	Remarks
1. Lohgaon (Remaining)					
Roads	1	-	90 M Ring Road	65 M with 12 M / 24 M Service Road	Alignment of road as per notification / data received from PMRDA.
	2	89 to 281	24 M	30 M- 36 M - 45 M	
Land Use Zones	3	304	Hill Top-Hill Slope	Forest Zone	As per 7/12 extract checked online on MahaBhulekh website.
	4	311, 312	Agricultural & No Dev. Zone	Resi. Zone + Hill top- Hill Slope Zone	As per surveys and site conditions.
	5	-	Water Body (Tank)	Urban Forest Reservation + Water Body	
	6	97P, 115P, 116, 117P, 119P, 120P, 123P, 124P, 125, 126, 132 318, 319	Agricultural & No Dev. Zone	Defense Restriction Zone with Reservations	As per the information received from PMC.
2. Mundhwa (Remaining Keshav- Nagar)					
Roads	1	5 to 16	24 M	36 M	Due to increased traffic capacity, congestion, and broader transportation strategy, road widths have been increased. Alignments have been proposed based on site conditions.
	2	8 to 32	18 M	24 M	
	3	23 to 41	18 M	36 M	
	4	26P, 27P, 28P	18 M	20 M	Alignment of road changed as per site conditions.

Village	Sr. No.	Survey No.	Sanctioned RP	Draft DP	Remarks
	5	29	18 M	24 M	As per Site Conditions and Connectivity to Integrated Township.
3. Hadapsar (Entire Sade Satara Nali)					
Roads	1	168 To 187	18 M	24 M	Due to increased traffic capacity, congestion, and broader transportation strategy, road widths have been increased. Alignments have been proposed based on site conditions.
	2	176, 177	18 M	24 M	
	3	200, 201	18 M	24 M	
	4	203	12 M	15 M	Due to increased traffic capacity, congestion, and broader transportation strategy, road widths have been increased. Alignments have been proposed based on site conditions & sanctioned layouts.
4 & 5. Shivane (Entire Uttam Nagar)					
Road	1	--	90 M Ring Road	65 M Ring Road with 12 M Service Road	Alignment of the road passing along the east side of the village boundary has been shifted further east, ensuring that Shivane village remains unaffected, as per data received from PMRDA
Land Use Zone	2	82, 83	Agricultural & No Dev. Zone	Industrial Zone	As per Industrial development on site.
6. Ambegaon Khurd (Remaining): Nill					
7. Undri (Remaining)					
Roads	1	27, 28, 29	24 M	60 M	Road is widened to 60 m as per SH-116 status. Due to increased traffic capacity, congestion, and

Village	Sr. No.	Survey No.	Sanctioned RP	Draft DP	Remarks
					broader transportation strategy, road widths have been increased.
	2	23 To Undri Gaothan	15 M (As per 10 Km Fringe area road network)	24 M	Due to increased traffic capacity, congestion, and broader transportation strategy, road widths have been increased.
8. Dhayari (Remaining)					
Roads	1	4 To 30	18 M	30 M	Due to increased traffic capacity, congestion, and broader transportation strategy, road widths have been increased.
	2	38 To 78	90 M	65 M with 12 M Service Road is only on east side.	Alignment of road as per notification / data received from PMRDA.
	3	105 To 116	90 M	65 M with 12 M Service Road	
9. Ambegaon Budruk (Remaining): Nill					

Annexure 2: Requirements for Public Amenities Across All Sectors for the Year 2035

1. Requirement of Public Amenities for Planning Sector 1- Lohgaon (Remaining) for population of 280390.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	56	22.4	12	5.5	23	7.82	35	13.32
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	28	28	10	10	14	13	24	23
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	19	1.12	0	0	13	1.39	13	1.36
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	28	20.8	2	0.3	8	1.39	10	1.69
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	3	2.4	10	3.8	4	4.26	14	8.06
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	19	28.5	6	9.71	38	36.68	44	46.39
7.	Garden	Min. area: 1 ha for every 15,000 population	19	19	0	0	18	40.07	18	40.07
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	3	6	0	0	1	0.8	1	0.8
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	3	1.5	3	0.47	1	0.27	4	0.74

2. Requirement of Public Amenities for Planning Sector 2- Mundhwa (Remaining Keshav Nagar) for population of 111945.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	22	8.80	5	0.35	8	3.2	13	3.55
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	11	11	6	0.78	6	4	12	4.78
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	7	0.42	0	0	6	0.73	6	0.73
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	11	1.1	0	0	2	0.3	2	0.3
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.80	5	0.132	2	1.07	7	1.20
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	7	10.5	1	0.34	20	8.1	21	8.44
7.	Garden	Min. area: 1 ha for every 15,000 population	7	7	1	0.34	9	7.13	10	7.47
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2	0	0	1	0.81	1	0.81
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.5	2	0.33	2	0.86	4	1.19

3. Requirement of Public Amenities for Planning Sector 3- Hadapsar (Entire Sade Satra Nali) for population of 103794.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	21	8.40	8	0.3	4	2.53	12	2.83
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	10	10	8	0.6	1	1	9	1.6
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	7	0.42	0	0	3	0.29	3	0.29
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	10	1	0	0	2	0.5	2	0.5
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.8	2	0.23	1	0.45	3	0.68
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	7	10.5	1	0.65	11	3.47	12	4.12
7.	Garden	Min. area: 1 ha for every 15,000 population	7	7	2	7.6	2	0.51	4	8.11
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2	0	0	0	0	0	0
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.5	0	0	0	0	0	0

4. Requirement of Public Amenities for Planning Sector 4- Undri (Remaining) for population of 57259.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	11	4.4	13	4.5	1	0.1	14	4.6
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	6	6	12	4.35	1	0.4	13	4.75
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	4	0.24	2	0.03	8	1.9	10	1.93
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	6	0.6	1	0.1	2	0.64	3	0.74
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.8	9	0.78	3	1.88	12	2.66
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	4	6	1	0.46	14	6.26	15	6.72
7.	Garden	Min. area: 1 ha for every 15,000 population	4	4	1	0.1	8	6.42	9	6.52
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2	0	0	0	0	0	0
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.5	1	0.14	1	0.3	2	0.44

5. Requirement of Public Amenities for Planning Sector 5- Ambegaon Bk. (Remaining) for population of 80519.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	16	6.4	11	1.18	1	0.40	12	1.58
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	8	8	10	1.18	0	0	10	1.18
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	5	0.32	1	0.03	5	0.28	6	0.31
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	8	0.8	3	0.09	3	0.25	6	0.35
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.8	3	0.13	1	0.12	4	0.26
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	5	7.5	10	4	17	3.53	27	7.53
7.	Garden	Min. area: 1 ha for every 15,000 population	5	5	0	0	10	3	10	3
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2	0	0	0	0	0	0
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.5	3	0.18	1	0.19	4	0.37

6. Requirement of Public Amenities for Planning Sector 6- Ambegaon Kh. (Remaining) for population of 49545.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	10	4.00	1	0.062	4	0.97	5	1.03
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	5	5.00	1	0.04	1	0.35	2	0.39
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	3	0.20	0	0	1	0.13	1	0.13
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	5	0.50	0	0	0	0	0	0.00
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	0	0.00	1	0.07	0	0	1	0.07
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	3	4.50	1	0.1	6	2.14	7	2.24
7.	Garden	Min. area: 1 ha for every 15,000 population	3	3.00	0	0	9	3.78	9	3.78
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	0	0.00	0	0	0	0	0	0.00
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	0	0.00	1	0.1	1	0.15	2	0.25

7. Requirement of Public Amenities for Planning Sector 7- Dhayari (Remaining) for population of 79617.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	16	6.40	8	1.533	5	1.72	13	3.25
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	8	8.00	4	1.242	4	3.03	8	4.27
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	5	0.30	0	0	6	0.41	6	0.41
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	8	0.80	0	0	4	0.55	4	0.55
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.80	1	0.092	1	0.45	2	0.54
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	5	7.50	1	0.149	14	8.68	15	8.83
7.	Garden	Min. area: 1 ha for every 15,000 population	5	5.00	0	0	24	16.58	24	16.58
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2.00	0	0	0	0	0	0.00
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.50	1	0.592	2	1.29	3	1.88

8. Requirement of Public Amenities for Planning Sector 8- Shivane (Remaining) & Shivane-Uttam Nagar for population of 65851.

Sr. No.	Purpose of Public Amenity	Planning Norms Adopted by PMC for 1 Unit	Required		Existing		Proposed		Total	
			No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)	No. of Sites	Area (Ha.)
1.	Primary School	Min. area: 0.4 ha for every 500 students (Students area 10 % of population)	13	5.20	6	0.734	4	0.9	10	1.634
2.	High School	Min. area: 1 ha for every 1,000 students (Students area 10 % of population)	7	7.00	3	0.596	3	1.76	6	2.356
3.	Dispensary	Min. area: 0.06 ha for every 15,000 population	4	0.26	2	0.04	1	0.06	3	0.1
4.	Maternity Home	Min. area: 0.1 ha for every 10,000 Population	7	0.70	1	0.03	1	0.3	2	0.33
5.	Hospital	Min. area: 0.8 ha for every 1,00,000 Population	1	0.80	4	0.1	1	0.42	5	0.52
6.	PG & CPG	Min. area: 1.5 ha for every 15,000 population	4	6.00	0	0	10	3.96	10	3.96
7.	Garden	Min. area: 1 ha for every 15,000 population	4	4.00	0	0	3	10.63	3	10.63
8.	Multipurpose Garden	Min. area: 2 ha for every 1,00,000 Population	1	2.00	0	0	0	0	0	0
9.	Crematorium	Min. area: 0.5 ha for every 1,00,000 Population	1	0.50	2	0.175	2	0.75	4	0.925

Annexure 3: Statement Showing List of Reservations for Amenities, their Cost of Acquisition and Development

Sector 1: Lohgaon (Remaining)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	1/1	Children Play Ground (CPG)	298	986.12	Private	6.80	0.33	7.13	PMC
2	1/2	Primary School (PS)	298	4215.97	Private	29.09	14.26	43.35	PMC
3	1/3	Market (M)	299	952.50	Private	6.57	3.22	9.79	PMC
4	1/4	Police Chowki (PC)	300	2150.71	Private	14.84	7.27	22.11	PMC
5	1/5	MSEDCL	301	1189.24	Private	8.21	4.02	12.23	PMC
6	1/6	Water Tank (WT)	300, 301	13642.26	Private	94.13	46.14	140.27	PMC
7	1/7	Garden (G)	301, 302	5004.56	Private	34.53	1.65	36.18	PMC
8	1/8	Dispensary & Maternity Home (D & MH)	301	1703.77	Private	11.76	5.76	17.52	PMC
9	1/9	Urban Health Centre (UHC)	298	2507.01	Private	17.30	8.48	25.78	PMC
10	1/10	Garden (G)	297	2791.71	Private	19.26	0.92	20.18	PMC
11	1/11	Water Tank (WT)	304	6537.63	Private	45.11	22.11	67.22	PMC
12	1/12	Garden (G)	306	15216.18	Private	104.99	5.02	110.01	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
13	1/13	Exhibition Centre (EC)	308, 309, 313, 314	123774.16	Private	854.04	418.61	1272.65	PMC
14	1/14	Primary School & High School (PS & HS)	303	6479.03	Private	44.71	21.91	66.62	PMC
15	1/15	Cultural Hall (CT H)	294	2903.97	Private	20.04	9.82	29.86	PMC
16	1/16	Play Ground (PG)	295	16844.22	Private	116.23	5.56	121.78	PMC
17	1/17	Municipal Purpose (MP)	298	1274.41	Private	8.79	4.31	13.10	PMC
18	1/18	Shopping Centre (SC)	298	2163.63	Private	14.93	7.32	22.25	PMC
19	1/19	Children Play Ground (CPG)	298	1759.86	Private	12.14	0.58	12.72	PMC
20	1/20	Dispensary & Maternity Home (D & MH)	297	3793.96	Private	26.18	12.83	39.01	PMC
21	1/21	Urban Spaces (US)	296	591.12	Private	4.08	0.20	4.27	PMC
22	1/22	Urban Spaces (US)	296	1635.91	Private	11.29	0.54	11.83	PMC
23	1/23	Primary School (PS)	296	1849.93	Private	12.76	0.61	13.37	PMC
24	1/24	Dispensary & Maternity Home (D & MH)	296	1230.75	Private	8.49	4.16	12.65	PMC
25	1/25	Primary School & High School (PS & HS)	295	6479.03	Private	44.71	21.91	66.62	PMC
26	1/26	Play Ground (PG)	307, 308	14980.12	Private	103.36	4.94	108.31	PMC
27	1/27	Urban Spaces (US)	296	383.62	Private	2.65	0.13	2.77	PMC
28	1/28	Parking (P)	284	2471.01	Private	17.05	0.82	17.87	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
29	1/29	Hospital (H)	284	5548.62	Private	38.29	18.77	57.05	PMC
30	1/30	Garden (G)	294	3634.46	Private	25.08	1.20	26.28	PMC
31	1/31	Public Housing (PH)	292	11114.29	Private	76.69	37.59	114.28	PMC
32	1/32	Public Convenience Center (PCC)	292	419.75	Private	2.90	1.42	4.32	PMC
33	1/33	Municipal Purpose (MP)	291	646.13	Private	4.46	2.19	6.64	PMC
34	1/34	Municipal Purpose (MP)	289	1576.30	Private	10.88	5.33	16.21	PMC
35	1/35	Primary School (PS)	288	2220.52	Private	15.32	7.51	22.83	PMC
36	1/36	Water Tank (WT)	288	805.35	Private	5.56	2.72	8.28	PMC
37	1/37	Urban Spaces (US)	291	312.26	Private	2.15	0.10	2.26	PMC
38	1/38	Shopping Centre (SC)	291	1326.33	Private	9.15	4.49	13.64	PMC
39	1/39	Dispensary & Maternity Home (D & MH)	286	2188.15	Private	15.10	7.40	22.50	PMC
40	1/40	Primary School & High School (PS & HS)	286	3500.22	Private	24.15	11.84	35.99	PMC
41	1/41	Children Play Ground (CPG)	285	2110.63	Private	14.56	0.70	15.26	PMC
42	1/42	Shopping Centre (SC)	285	2215.48	Private	15.29	7.49	22.78	PMC
43	1/43	Children Play Ground (CPG)	284	670.47	Private	4.63	0.22	4.85	PMC
44	1/44	Primary School (PS)	284	3228.34	Private	22.28	10.92	33.19	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
45	1/45	Children Play Ground (CPG)	284	1011.13	Private	6.98	0.33	7.31	PMC
46	1/46	Children Play Ground (CPG)	284	1031.10	Private	7.11	0.34	7.45	PMC
47	1/47	Municipal Office (MO)	283	3905.05	Private	26.94	13.21	40.15	PMC
48	1/48	Municipal Purpose (MP)	283	2135.61	Private	14.74	7.22	21.96	PMC
49	1/49	Urban Health Centre (UHC)	283	1134.93	Private	7.83	3.84	11.67	PMC
50	1/50	Children Play Ground (CPG)	285	599.71	Private	4.14	0.20	4.34	PMC
51	1/51	Play Ground (PG)	286	3778.77	Private	26.07	1.25	27.32	PMC
52	1/52	Primary School & High School (PS & HS)	6	14461.48	Private	99.78	48.91	148.69	PMC
53	1/53	Public Housing (PH)	9, 10	21697.15	Private	149.71	73.38	223.09	PMC
54	1/54	Play Ground (PG)	19	15068.41	Private	103.97	4.97	108.94	PMC
55	1/55	Shopping Centre (SC)	20	4140.00	Private	28.57	14.00	42.57	PMC
56	1/56	Primary School & High School (PS & HS)	9, 10	16562.78	Private	114.28	56.02	170.30	PMC
57	1/57	Public Housing (PH)	5, 8	26148.80	Private	180.43	88.44	268.86	PMC
58	1/58	Primary School (PS)	313	4177.81	Private	28.83	14.13	42.96	PMC
59	1/59	Play Ground (PG)	4	4717.11	Private	32.55	1.56	34.10	PMC
60	1/60	Dispensary (D)	8	1399.59	Private	9.66	4.73	14.39	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
61	1/61	Sponge Garden (SP G)	12, 18	44977.52	Private	310.34	14.84	325.19	PMC
62	1/62	MSEDCL	21	10749.31	Private	74.17	36.35	110.53	PMC
63	1/63	Dispensary & Maternity Home (D & MH)	24	5602.03	Private	38.65	18.95	57.60	PMC
64	1/64	Public Housing (PH)	34	34381.43	Private	237.23	116.28	353.51	PMC
65	1/65	Municipal Office (MO)	36, 37	17421.91	Government	0.00	58.92	58.92	PMC
66	1/66	Water Tank (WT)	35	9917.67	Government	0.00	33.54	33.54	PMC
67	1/67	Play Ground (PG)	35	12343.07	Government	0.00	4.07	4.07	PMC
68	1/68	Primary School (PS)	35	7965.77	Government	0.00	26.94	26.94	PMC
69	1/69	Public Housing (PH)	35	35008.65	Government	0.00	118.40	118.40	PMC
70	1/70	Municipal Office (MO)	35	9126.11	Government	0.00	30.87	30.87	PMC
71	1/71	Sponge Garden (SP G)	Lake	105964.86	Government	0.00	34.97	34.97	PMC
72	1/72	Garden (G)	54	4945.61	Private	34.12	1.63	35.76	PMC
73	1/73	Children Play Ground (CPG)	61	2629.07	Private	18.14	0.87	19.01	PMC
74	1/74	Children Play Ground (CPG)	63,64	2701.32	Private	18.64	0.89	19.53	PMC
75	1/75	Primary School (PS)	16	5486.81	Private	37.86	18.56	56.42	PMC
76	1/76	Play Ground (PG)	15,16	20619.01	Private	142.27	6.80	149.08	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
77	1/77	Urban Spaces (US)	316	521.10	Government	0.00	0.17	0.17	PMC
78	1/78	Urban Spaces (US)	316	70.46	Government	0.00	0.02	0.02	PMC
79	1/79	Urban Spaces (US)	316	1993.91	Government	0.00	0.66	0.66	PMC
80	1/80	Garden (G)	315	5099.66	Private	35.19	1.68	36.87	PMC
81	1/81	Urban Spaces (US)	316	941.37	Government	0.00	0.31	0.31	PMC
82	1/82	Garden (G)	317	3129.83	Private	21.60	1.03	22.63	PMC
83	1/83	Dispensary & Maternity Home (D & MH)	1	1602.48	Private	11.06	5.42	16.48	PMC
84	1/84	Crematorium (CG)	2, 16	2724.99	Private	18.80	0.90	19.70	PMC
85	1/85	Children Play Ground (CPG)	16	608.44	Private	4.20	0.20	4.40	PMC
86	1/86	Industrial Training Institute (ITI)	25	27054.44	Private	186.68	91.50	278.18	PMC
87	1/87	Educational Complex (EC)	26	53488.98	Private	369.07	180.90	549.98	PMC
88	1/88	Play Ground (PG)	26, 32	17556.24	Private	121.14	5.79	126.93	PMC
89	1/89	Garden (G)	28, 29	14380.00	Private	99.22	4.75	103.97	PMC
90	1/90	Primary School & High School (PS & HS)	28, 29	19272.00	Private	132.98	65.18	198.16	PMC
91	1/91	Garden (G)	27, 28	18724.00	Private	129.20	6.18	135.37	PMC
92	1/92	Hospital (H)	32	24989.96	Private	172.43	84.52	256.95	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
93	1/93	Sewage Treatment Plant (STP)	32	23642.79	Private	163.14	79.96	243.10	PMC
94	1/94	Garden (G)	31	19432.36	Private	134.08	6.41	140.50	PMC
95	1/95	Public Housing (PH)	30	25542.73	Private	176.24	86.39	262.63	PMC
96	1/96	Park (P)	41	163594.40	Private	1128.80	53.99	1182.79	PMC
97	1/97	Municipal Purpose (MP)	41	23517.09	Private	162.27	79.54	241.80	PMC
98	1/98	Play Ground (PG)	44	7505.05	Private	51.78	2.48	54.26	PMC
99	1/99	Public Housing (PH)	37, 40, 52, 53	25542.73	Private	176.24	86.39	262.63	PMC
100	1/100	Children Play Ground (CPG)	282	2269.53	Private	15.66	0.75	16.41	PMC
101	1/101	Children Play Ground (CPG)	283	1982.18	Private	13.68	0.65	14.33	PMC
102	1/102	Municipal Purpose (MP)	283	1129.33	Private	7.79	3.82	11.61	PMC
103	1/103	Children Play Ground (CPG)	285	1435.20	Private	9.90	0.47	10.38	PMC
104	1/104	Primary School & High School (PS & HS)	286	6883.82	Private	47.50	23.28	70.78	PMC
105	1/105	Municipal Purpose (MP)	287	2100.61	Private	14.49	7.10	21.60	PMC
106	1/106	Urban Spaces (US)	288	1915.56	Private and 60 m RP Road	13.22	0.63	13.85	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
107	1/107	MSEDCL	288	4175.10	Private and 60 m RP Road	28.81	14.12	42.93	PMC
108	1/108	Dispensary (D)	288	1548.25	Private	10.68	5.24	15.92	PMC
109	1/109	Shopping Centre (SC)	287	1317.01	Private	9.09	4.45	13.54	PMC
110	1/110	Children Play Ground (CPG)	287	1192.28	Private	8.23	0.39	8.62	PMC
111	1/111	Children Play Ground (CPG)	282	1586.64	Private	10.95	0.52	11.47	PMC
112	1/112	Water Tank (WT)	282	1514.74	Private	10.45	5.12	15.57	PMC
113	1/113	Public Convenience Center (PCC)	282	560.99	Private	3.87	1.90	5.77	PMC
114	1/114	Garden (G)	282	821.34	Private	5.67	0.27	5.94	PMC
115	1/115	Urban Spaces (US)	282	173.13	Private	1.19	0.06	1.25	PMC
116	1/116	Market (M)	281	1113.00	Private	7.68	3.76	11.44	PMC
117	1/117	Children Play Ground (CPG)	281	1236.87	Private	8.53	0.41	8.94	PMC
118	1/118	Municipal Purpose (MP)	281	558.22	Private	3.85	1.89	5.74	PMC
119	1/119	Dispensary & Maternity Home (D & MH)	276	1851.60	Private	12.78	6.26	19.04	PMC
120	1/120	Urban Spaces (US)	276	1206.83	Private and 60 m RP Road	8.33	0.40	8.73	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
121	1/121	Urban Spaces (US)	276, 277	2823.96	Private	19.49	0.93	20.42	PMC
122	1/122	Primary School & High School (PS & HS)	277	4971.22	Private	34.30	16.81	51.11	PMC
123	1/123	Primary School & High School (PS & HS)	277	1574.60	Private	10.86	5.33	16.19	PMC
124	1/124	Children Play Ground (CPG)	276	695.38	Private	4.80	0.23	5.03	PMC
125	1/125	Fire Brigade & Disaster Management (FB & DM)	289	6976.71	Private	48.14	23.60	71.74	PMC
126	1/126	Public Convenience Center (PCC)	Gaothan	880.24	Private	6.07	2.98	9.05	PMC
127	1/127	Primary School & High School (PS & HS)	59, 61	14282.54	Private	98.55	48.30	146.85	PMC
128	1/128	Water Tank (WT)	Lake	1198.39	Private	8.27	4.05	12.32	PMC
129	1/129	Play Ground (PG)	54	14966.48	Private	103.27	4.94	108.21	PMC
130	1/130	Children Play Ground (CPG)	67, 77	4457.12	Private	30.75	1.47	32.22	PMC
131	1/131	Children Play Ground (CPG)	67	5692.03	Private	39.28	1.88	41.15	PMC
132	1/132	Shopping Centre (SC)	67	4396.55	Private	30.34	14.87	45.21	PMC
133	1/133	Children Play Ground (CPG)	68	928.62	Private	6.41	0.31	6.71	PMC
134	1/134	Water Tank (WT)	Gaothan	1999.56	Government	0.00	6.76	6.76	PMC
135	1/135	Multipurpose Ground (MPG)	Gaothan	7991.44	Government	0.00	2.64	2.64	PMC
136	1/136	Primary School (PS)	68	3384.14	Private	23.35	11.45	34.80	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
137	1/137	Market (M)	275	786.85	Private	5.43	2.66	8.09	PMC
138	1/138	Children Play Ground (CPG)	274	2648.60	Private	18.28	0.87	19.15	PMC
139	1/139	Truck Terminus (TT)	Gaothan	1864.62	Private	12.87	0.62	13.48	PMC
140	1/140	Municipal Office (MO)	69	589.38	Private	4.07	1.99	6.06	PMC
141	1/141	Parking (P)	69	776.36	Private	5.36	0.26	5.61	PMC
142	1/142	Municipal Purpose (MP)	69	624.44	Private	4.31	2.11	6.42	PMC
143	1/143	Parking (P)	69	1330.82	Private	9.18	0.44	9.62	PMC
144	1/144	Municipal Purpose (MP)	69	447.19	Private	3.09	1.51	4.60	PMC
145	1/145	Shopping Centre (SC)	73	1619.21	Private	11.17	5.48	16.65	PMC
146	1/146	Sponge Garden (SP G)	72	13234.02	Private	91.31	4.37	95.68	PMC
147	1/147	Police Chowki (PC)	72	916.42	Private	6.32	3.10	9.42	PMC
148	1/148	Play Ground (PG)	76	7474.36	Private	51.57	2.47	54.04	PMC
149	1/149	Children Play Ground (CPG)	80, 81	3614.15	Private	24.94	1.19	26.13	PMC
150	1/150	Primary School & High School (PS & HS)	81	6945.03	Private	47.92	23.49	71.41	PMC
151	1/151	Fire Brigade & Disaster Management (FB & DM)	57	4881.47	Private	33.68	16.51	50.19	PMC
152	1/152	Public Convenience Center (PCC)	84	1632.86	Private	11.27	5.52	16.79	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
153	1/153	Garden (G)	82, 84, 85	27650.06	Private	190.79	9.12	199.91	PMC
154	1/154	Play Ground (PG)	99, 115	53977.75	Private	372.45	17.81	390.26	PMC
155	1/155	Sewerage Work (SW)	115	24154.65	Private	166.67	81.69	248.36	PMC
156	1/156	Garbage Processing Plant (GPP)	115	76731.43	Private	529.45	259.51	788.96	PMC
157	1/157	Primary School (PS)	50	4721.57	Private	32.58	15.97	48.55	PMC
158	1/158	Hospital (H)	45	5810.00	Private	40.09	19.65	59.74	PMC
159	1/159	Play Ground (PG)	46	8867.00	Private	61.18	2.93	64.11	PMC
160	1/160	Post Office (PO)	84	479.50	Private	3.31	1.62	4.93	PMC
161	1/161	Library (L)	84	475.71	Private	3.28	1.61	4.89	PMC
162	1/162	Primary School & High School (PS & HS)	49	9359.50	Private	64.58	31.65	96.24	PMC
163	1/163	Garden (G)	88	2880.46	Private	19.88	0.95	20.83	PMC
164	1/164	Garden (G)	89	6743.94	Private	46.53	2.23	48.76	PMC
165	1/165	Hospital (H)	95	6279.01	Private	43.33	21.24	64.56	PMC
166	1/166	Primary School & High School (PS & HS)	90, 95	15149.40	Private	104.53	51.24	155.77	PMC
167	1/167	Garden (G)	118	10177.64	Private	70.23	3.36	73.58	PMC
168	1/168	Dispensary & Maternity Home (D & MH)	118	1601.91	Private	11.05	5.42	16.47	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
169	1/169	Primary School & High School (PS & HS)	118, 119	12661.05	Private	87.36	42.82	130.18	PMC
170	1/170	Play Ground (PG)	119, 120	45936.32	Private	316.96	15.16	332.12	PMC
171	1/171	Dispensary (D)	121	1315.32	Private	9.08	4.45	13.52	PMC
172	1/172	Open Market (OM)	123, 132	28460.73	Private	196.38	9.39	205.77	PMC
173	1/173	Play Ground PG)	123, 132	65116.61	Private	449.30	21.49	470.79	PMC
174	1/174	Parking (P)	123	12931.94	Private	89.23	4.27	93.50	PMC
175	1/175	Parking (P)	134	4197.08	Private	28.96	1.39	30.34	PMC

Note:

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- *The cadastral/revenue data of subdivided land parcels (survey no./gat no.) are not incorporated while preparation of maps. The shown reservations can be accommodated in various land parcels or sub-parcels. Therefore, while serving any notice by the owner of any land against any reservation/designation under relevant sections of the MR&TP Act 1966, they may provide an authentic measurement sheet along with its application.*
- *The estimated acquisition and development costs have been derived from the Annual Statement of Rates (ASR) and the District Schedule of Rates (DSR). The rates for acquisition of land are derived on average ASR bases and Section 26 of the LARR Act 2013; therefore, are on the higher side. These estimates are indicative and may vary depending on the location, prevailing market conditions, and the year of acquisition or development. Approximately 45 to 50 percent of the reservations have been proposed on the Amenity Spaces (AS) of sanctioned layouts.*

Sector 2: Mundhwa (Remaining Keshav Nagar)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	2/1	Children Play Ground (CPG)	10	932.34	Private	5.59	0.31	5.90	PMC
2	2/2	Sewerage Work (SW)	13	13888.02	Government	0.00	46.97	46.97	PMC
3	2/3	Garden (G)	10	7123.15	Private	42.74	2.35	45.09	PMC
4	2/4	Municipal Purpose (MP)	10	1002.02	Private	6.01	3.39	9.40	PMC
5	2/5	Municipal Office (MO)	10	6325.42	Private	37.95	21.39	59.35	PMC
6	2/6	Play Ground (PG)	11	11769.67	Private	70.62	3.88	74.50	PMC
7	2/7	Play Ground (PG)	11, 12	3608.77	Private	21.65	1.19	22.84	PMC
8	2/8	Garbage Processing Plant (GPP)	13	11288.26	Private	67.73	38.18	105.91	PMC
9	2/9	Municipal Purpose (MP)	13	4277.13	Private	25.66	14.47	40.13	PMC
10	2/10	Urban Spaces (US)	15	354.88	Private	2.13	0.12	2.25	PMC
11	2/11	Burial Ground for Animals (BGA)	16	9117.09	Private	54.70	3.01	57.71	PMC
12	2/12	Garden (G)	18, 95	38983.22	Private	233.90	12.86	246.76	PMC
13	2/13	Primary School & High School (PS & HS)	17, 95	10105.32	Private	60.63	34.18	94.81	PMC
14	2/14	Water Tank (WT)	17	2407.32	Private	14.44	8.14	22.59	PMC
15	2/15	Bus Depot (BD)	17	18472.65	Private	110.84	62.48	173.31	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
16	2/16	Garden (G)	13, 15	2977.16	Private	17.86	0.98	18.85	PMC
17	2/17	Municipal Purpose (MP)	13	1010.65	Private	6.06	3.42	9.48	PMC
18	2/18	Dispensary (D)	13	862.71	Private	5.18	2.92	8.09	PMC
19	2/19	Children Play Ground (CPG)	12	843.80	Private	5.06	0.28	5.34	PMC
20	2/20	Garden (G)	12	2289.47	Private	13.74	0.76	14.49	PMC
21	2/21	Primary School (PS)	12	5617.01	Private	33.70	19.00	52.70	PMC
22	2/22	Shopping Centre (SC)	9	3619.60	Private	21.72	12.24	33.96	PMC
23	2/23	Municipal Office (MO)	9	2224.88	Private	13.35	7.52	20.87	PMC
24	2/24	Slum Improvement (SI)	6, 9, 10	1045.97	Private	6.28	0.35	6.62	PMC
25	2/25	Children Play Ground (CPG)	9	2128.14	Private	12.77	0.70	13.47	PMC
26	2/26	Garden (G)	9, 10	5411.11	Private	32.47	1.79	34.25	PMC
27	2/27	Primary School (PS)	6, 10	4743.14	Private	28.46	16.04	44.50	PMC
28	2/28	High School (HS)	6, 10	4707.17	Government	0.00	15.92	15.92	PMC
29	2/29	Crematorium (CG)	100	2696.83	Private	16.18	0.89	17.07	PMC
30	2/30	Burial Ground (BG)	100	5913.42	Private	35.48	1.95	37.43	PMC
31	2/31	Veterinary Hospital (VH)	6	2021.19	Private	12.13	6.84	18.96	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
32	2/32	Slum Improvement (SI)	6	11155.13	Government	0.00	37.73	37.73	PMC
33	2/33	Fire Brigade & Disaster Management (FB & DM)	6	5213.85	Government	0.00	17.63	17.63	PMC
34	2/34	Shopping Centre (SC)	7	2339.18	Private	14.04	7.91	21.95	PMC
35	2/35	Shopping Centre (SC)	8	1345.86	Private	8.08	4.55	12.63	PMC
36	2/36	Municipal Purpose (MP)	9	1965.01	Private	11.79	6.65	18.44	PMC
37	2/37	Children Play Ground (CPG)	9	1541.08	Private	9.25	0.51	9.76	PMC
38	2/38	Hospital (H)	8	3828.65	Private	22.97	12.95	35.92	PMC
39	2/39	Children Play Ground (CPG)	8	1537.57	Private	9.23	0.51	9.73	PMC
40	2/40	Urban Spaces (US)	8	1221.93	Private	7.33	0.40	7.73	PMC
41	2/41	Children Play Ground (CPG)	8	1937.93	Private	11.63	0.64	12.27	PMC
42	2/42	Children Play Ground (CPG)	8	1421.70	Private	8.53	0.47	9.00	PMC
43	2/43	Primary School & High School (PS & HS)	8, 19	10105.32	Private	60.63	34.18	94.81	PMC
44	2/44	Urban Spaces (US)	19	816.07	Private	4.90	0.27	5.17	PMC
45	2/45	Dispensary & Maternity Home (D & MH)	19	1642.71	Private	9.86	5.56	15.41	PMC
46	2/46	Shopping Centre (SC)	20	2575.42	Private	15.45	8.71	24.16	PMC
47	2/47	Post Office (PO)	33	1418.51	Private	8.51	4.80	13.31	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
48	2/48	Dispensary (D)	33	957.39	Private	5.74	3.24	8.98	PMC
49	2/49	Urban Health Centre (UHC)	33	2805.37	Private	16.83	9.49	26.32	PMC
50	2/50	Garden (G)	35, 36	1615.02	Private	9.69	0.53	10.22	PMC
51	2/51	Library (L)	36	1062.17	Private	6.37	3.59	9.97	PMC
52	2/52	Municipal Purpose (MP)	37	1469.47	Private	8.82	4.97	13.79	PMC
53	2/53	Children Play Ground (CPG)	37	1590.89	Private	9.55	0.52	10.07	PMC
54	2/54	Police Chowki (PC)	40, 41	1889.54	Private	11.34	6.39	17.73	PMC
55	2/55	Dispensary & Maternity Home (D & MH)	41	2698.60	Private	16.19	9.13	25.32	PMC
56	2/56	Primary School & High School (PS & HS)	37	4382.15	Private	26.29	14.82	41.11	PMC
57	2/57	Shopping Centre (SC)	37	1765.59	Private	10.59	5.97	16.56	PMC
58	2/58	Water Tank (WT)	36	1823.37	Private	10.94	6.17	17.11	PMC
59	2/59	Public Convenience Center (PCC)	36	1065.37	Private	6.39	3.60	10.00	PMC
60	2/60	Primary School (PS)	35	8176.91	Private	49.06	27.65	76.72	PMC
61	2/61	Play Ground (PG)	34	4710.10	Private	28.26	1.55	29.81	PMC
62	2/62	Children Play Ground (CPG)	32	1034.89	Private	6.21	0.34	6.55	PMC
63	2/63	Garden (G)	33	2148.21	Private	12.89	0.71	13.60	PMC

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Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
64	2/64	Children Play Ground (CPG)	33	1442.98	Private	8.66	0.48	9.13	PMC
65	2/65	Play Ground (PG)	20, 22	18387.26	Private	110.32	6.07	116.39	PMC
66	2/66	Cultural Hall (CT H)	22	13554.38	Private	81.33	45.84	127.17	PMC
67	2/67	Hospital (H)	22	6843.48	Private	41.06	23.15	64.21	PMC
68	2/68	Garden (G)	31	3069.65	Private	18.42	1.01	19.43	PMC
69	2/69	Shopping Centre (SC)	36	2306.75	Private	13.84	7.80	21.64	PMC
70	2/70	Garden (G)	39	7681.50	Private	46.09	2.53	48.62	PMC
71	2/71	Water Tank (WT)	41	3967.28	Private	23.80	13.42	37.22	PMC
72	2/72	Play Ground (PG)	38, 39	3640.71	Private	21.84	1.20	23.05	PMC
73	2/73	Children Play Ground (CPG)	38	1274.07	Private	7.64	0.42	8.06	PMC
74	2/74	Play Ground (PG)	31	5857.53	Private	35.15	1.93	37.08	PMC
75	2/75	Dispensary (D)	31	1365.79	Private	8.19	4.62	12.81	PMC
76	2/76	Play Ground (PG)	38	2011.85	Private	12.07	0.66	12.74	PMC
77	2/77	Play Ground (PG)	27, 28	14431.18	Private	86.59	4.76	91.35	PMC
78	2/78	Multipurpose Ground (MPG)	28	8104.08	Private	48.62	2.67	51.30	PMC
79	2/79	Educational Complex (EC)	26, 27P	12901.00	Private	77.41	43.63	121.04	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
80	2/80	Urban Spaces (US)	28P	867.83	Private	5.21	0.29	5.49	PMC

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- *The estimated acquisition and development costs have been derived from the Annual Statement of Rates (ASR) and the District Schedule of Rates (DSR). The rates for acquisition of land are derived on average ASR bases and Section 26 of the LARR Act 2013; therefore, are on the higher side. These estimates are indicative and may vary depending on the location, prevailing market conditions, and the year of acquisition or development. Approximately 45 to 50 percent of the reservations have been proposed on the Amenity Spaces (AS) of sanctioned layouts.*

Sector 3: Hadapsar (Entire Sadesatra Nali)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	3/1	Urban Spaces (US)		1031.36	Private	7.12	0.34	7.46	PMC
2	3/2	Urban Spaces (US)	187	2199.66	Government	0.00	0.73	0.73	PMC
3	3/3	Children Play Ground (CPG)	179 P	984.53	Government	0.00	0.32	0.32	PMC
4	3/4	Children Play Ground (CPG)	180	800.26	Private	5.52	0.26	5.79	PMC
5	3/5	MSEDCL	186	1640.33	Private	11.32	5.55	16.87	PMC
6	3/6	Urban Spaces (US)	243, 244	2736.23	Private	18.88	0.90	19.78	PMC
7	3/7	Urban Spaces (US)	243, 244	2736.23	Private	18.88	0.90	19.78	PMC
8	3/8	Urban Spaces (US)	244	10406.04	Private	71.80	3.43	75.24	PMC
9	3/9	Urban Spaces (US)	244	10406.04	Private	71.80	3.43	75.24	PMC
10	3/10	Urban Spaces (US)	189	2289.78	Private	15.80	0.76	16.56	PMC
11	3/11	Urban Spaces (US)	189	2289.78	Private	15.80	0.76	16.56	PMC
12	3/12	Primary School (PS)	179	9995.89	Private	68.97	33.81	102.78	PMC
13	3/13	Nala Garden (NG)	180P	3085.21	Private	21.29	1.02	22.31	PMC
14	3/14	Bus Bay (BB)	185P, 181	645.16	Private	4.45	0.21	4.66	PMC
15	3/15	Garden (G)	183	1967.52	Private	13.58	0.65	14.23	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
16	3/16	Parking (P)	183	950.26	Private	6.56	0.31	6.87	PMC
17	3/17	Urban Spaces (US)	193P, 195A	2289.78	Private	15.80	0.76	16.56	PMC
18	3/18	Police Chowki (PC)	291	1065.53	Private	7.35	3.60	10.96	PMC
19	3/19	Post Office (PO)	290, 291	1044.82	Private	7.21	3.53	10.74	PMC
20	3/20	Public Convenience Center (PCC)	290	421.89	Government	0.00	1.43	1.43	PMC
21	3/21	Dispensary & Maternity Home (D & MH)	Quarry	3672.02	Private	25.34	12.42	37.76	PMC
22	3/22	Primary School & High School (PS & HS)	Quarry, 275, 276	14258.87	Government	0.00	48.22	48.22	PMC
23	3/23	Water Tank (WT)	Quarry, 275	2499.83	Government	0.00	8.45	8.45	PMC
24	3/24	Library (L)	177	809.79	Private	5.59	2.74	8.33	PMC
25	3/25	Parking (P)	182	1436.29	Private	9.91	0.47	10.38	PMC
26	3/26	Children Play Ground (CPG)	177	917.03	Private	6.33	0.30	6.63	PMC
27	3/27	Urban Spaces (US)	177	519.76	Private	3.59	0.17	3.76	PMC
28	3/28	Parking (P)	174	1213.05	Private	8.37	0.40	8.77	PMC
29	3/29	Primary School (PS)	172	5236.97	Private	36.14	17.71	53.85	PMC
30	3/30	Children Play Ground (CPG)	171	1801.41	Private	12.43	0.59	13.02	PMC
31	3/31	Municipal Purpose (MP)	171	1940.77	Private	13.39	6.56	19.96	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
32	3/32	Play Ground (PG)	237, 238	2998.35	Private	20.69	0.99	21.68	PMC
33	3/33	Shopping Centre (SC)	167	3000.43	Private	20.70	10.15	30.85	PMC
34	3/34	Parking (P)	168B	4148.56	Private	28.63	1.37	29.99	PMC
35	3/35	Children Play Ground (CPG)	201	1017.00	Private	7.02	0.34	7.35	PMC
36	3/36	Municipal Office (MO)	171	4658.25	Private	32.14	15.75	47.90	PMC
37	3/37	Urban Spaces (US)	171	453.20	Private	3.13	0.15	3.28	PMC
38	3/38	Urban Spaces (US)	Quarry, 273	705.63	Private	4.87	0.23	5.10	PMC
39	3/39	Hospital (H)	202	4450.48	Private	30.71	15.05	45.76	PMC
40	3/40	Children Play Ground (CPG)	Quarry	3844.22	Private	26.53	1.27	27.79	PMC
41	3/41	Dispensary & Maternity Home (D & MH)	Quarry	2891.62	Government	0.00	9.78	9.78	PMC
42	3/42	Play Ground (PG)	Quarry, 204, 272	11946.20	Government	0.00	3.94	3.94	PMC
43	3/43	Children Play Ground (CPG)	204	3707.14	Private	25.58	1.22	26.80	PMC
44	3/44	Children Play Ground (CPG)	204	1460.90	Private	10.08	0.48	10.56	PMC
45	3/45	Play Ground (PG)	214	5237.18	Private	36.14	1.73	37.86	PMC
46	3/46	Primary School (PS)	214	5826.13	Private	40.20	19.70	59.90	PMC
47	3/47	Dispensary (D)	191	1259.45	Private	8.69	4.26	12.95	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
48	3/48	Slum Improvement (SI)	Quarry	705.63	Private	4.87	0.23	5.10	PMC

Note:

- *All reservations shown in the Draft Development Plan are accurately located on their respective part survey numbers, as mentioned in the table above, and are duly indicated in the plan. Land ownership information has been provided by the PMC.*
- *The cadastral/revenue data of subdivided land parcels (survey no./gat no.) are not incorporated while preparation of maps. The shown reservations can be accommodated in various land parcels or sub-parcels. Therefore, while serving any notice by the owner of any land against any reservation/designation under relevant sections of the MR&TP Act 1966, they may provide an authentic measurement sheet along with its application.*
- *The estimated acquisition and development costs have been derived from the Annual Statement of Rates (ASR) and the District Schedule of Rates (DSR). The rates for acquisition of land are derived on average ASR bases and Section 26 of the LARR Act 2013; therefore, are on the higher side. These estimates are indicative and may vary depending on the location, prevailing market conditions, and the year of acquisition or development. Approximately 45 to 50 percent of the reservations have been proposed on the Amenity Spaces (AS) of sanctioned layouts.*

Sector 4: Undri (Remaining)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	4/1	Municipal Purpose (MP)	13	1586.77	Private	8.57	5.37	13.94	PMC
2	4/2	Dispensary (D)	13	2305.12	Private	12.45	7.80	20.24	PMC
3	4/3	Municipal Purpose (MP)	12	1020.06	Private	5.51	3.45	8.96	PMC
4	4/4	Cultural Hall (CT H)	13	7383.06	Private	39.87	24.97	64.84	PMC
5	4/5	Public Convenience Center (PCC)	12	290.37	Private	1.57	0.98	2.55	PMC
6	4/6	Municipal Purpose (MP)	17	1804.95	Private	9.75	6.10	15.85	PMC
7	4/7	Urban Spaces (US)	20	2418.03	Private	13.06	0.80	13.86	PMC
8	4/8	Water Tank (WT)	20	2074.66	Private	11.20	7.02	18.22	PMC
9	4/9	Hospital (H)	19	5097.26	Private	27.53	17.24	44.76	PMC
10	4/10	Municipal Purpose (MP)	21	2475.49	PMC	0.00	8.37	8.37	PMC
11	4/11	Children Play Ground (CPG)	19, 21	1737.60	PMC	0.00	0.57	0.57	PMC
12	4/12	Children Play Ground (CPG)	17	4378.16	Private	23.64	1.44	25.09	PMC
13	4/13	Municipal Purpose (MP)	16, 17	2355.25	Private	12.72	7.97	20.68	PMC
14	4/14	Urban Health Centre (UHC)	15	1419.52	Private	7.67	4.80	12.47	PMC
15	4/15	Parking (P)	15	3296.40	Private	17.80	1.09	18.89	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
16	4/16	Play Ground (PG)	7	2629.75	Private	14.20	0.87	15.07	PMC
17	4/17	Municipal Purpose (MP)	16	888.68	Private	4.80	3.01	7.80	PMC
18	4/18	Play Ground (PG)	18	6530.16	PMC	0.00	2.15	2.15	PMC
19	4/19	Garden (G)	4	11646.81	Private	62.89	3.84	66.74	PMC
20	4/20	Municipal Housing (MUH)	22	18862.40	Private	101.86	63.79	165.65	PMC
21	4/21	Garbage Processing Plant (GPP)	22	4837.98	Private	26.13	16.36	42.49	PMC
22	4/22	Municipal Purpose (MP)	23	2400.66	PMC	0.00	8.12	8.12	PMC
23	4/23	Children Play Ground (CPG)	23	5371.19	Private	29.00	1.77	30.78	PMC
24	4/24	Hospital (H)	2, 3	7494.31	PMC	0.00	25.35	25.35	PMC
25	4/25	Garden (G)	5	744.63	Private	4.02	0.25	4.27	PMC
26	4/26	Garden (G)	5	572.99	Private	3.09	0.19	3.28	PMC
27	4/27	Parking (P)	5	1955.12	Private	10.56	0.65	11.20	PMC
28	4/28	Children Play Ground (CPG)	6, 7	1974.80	Private	10.66	0.65	11.32	PMC
29	4/29	Children Play Ground (CPG)	5	1871.07	Private	10.10	0.62	10.72	PMC
30	4/30	Urban Spaces (US)	24	380.23	Private	2.05	0.13	2.18	PMC
31	4/31	Urban Spaces (US)	24	122.99	Private	0.66	0.04	0.70	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
32	4/32	Shopping Centre (SC)	25	1868.27	Private	10.09	6.32	16.41	PMC
33	4/33	Municipal Purpose (MP)	24	2448.80	Private	13.22	8.28	21.51	PMC
34	4/34	Municipal Purpose (MP)	24	1586.16	PMC	0.00	5.36	5.36	PMC
35	4/35	Urban Health Centre (UHC)	24	2782.42	Private	15.03	9.41	24.44	PMC
36	4/36	Working Women Hostel	24, 26	2128.68	Private	11.49	7.20	18.69	PMC
37	4/37	Shopping Centre (SC)	26	1480.05	Private	7.99	5.01	13.00	PMC
38	4/38	Bus Bay (BB)	26	603.88	Private	3.26	0.20	3.46	PMC
39	4/39	Post Office (PO)	26	894.34	PMC	0.00	3.02	3.02	PMC
40	4/40	Water Tank (WT)	25	1552.07	Private	8.38	5.25	13.63	PMC
41	4/41	Police Station (PSTN)	25	1574.26	PMC	0.00	5.32	5.32	PMC
42	4/42	Municipal Purpose (MP)	25	1283.12	Private	6.93	4.34	11.27	PMC
43	4/43	Parking (P)	25	2091.52	Private	11.29	0.69	11.98	PMC
44	4/44	Crematorium (CG)	29, Gaothan	2982.27	Private	16.10	0.98	17.09	PMC
45	4/45	Dispensary & Maternity Home (D & MH)	1	3334.53	Private	18.01	11.28	29.28	PMC
46	4/46	Public Convenience Center (PCC)	60	145.86	Private	0.79	0.49	1.28	PMC
47	4/47	Urban Health Centre (UHC)	59	5485.73	Private	29.62	18.55	48.18	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
48	4/48	Water Tank (WT)	59	1696.04	Private	9.16	5.74	14.89	PMC
49	4/49	Urban Health Centre (UHC)	28	1529.63	Private	8.26	5.17	13.43	PMC
50	4/50	Children Play Ground (CPG)	28	2913.67	Private	15.73	0.96	16.70	PMC
51	4/51	Municipal Purpose (MP)	27	3156.08	Private	17.04	10.67	27.72	PMC
52	4/52	Urban Spaces (US)	27	406.89	Private	2.20	0.13	2.33	PMC
53	4/53	Parking (P)	58	1303.22	Private	7.04	0.43	7.47	PMC
54	4/54	Parking (P)	58	2350.00	Private	12.69	0.78	13.47	PMC
55	4/55	Parking (P)	58	2003.00	Private	10.82	0.66	11.48	PMC
56	4/56	Shopping Centre (SC)	54	7210.72	Private	38.94	24.39	63.33	PMC
57	4/57	Municipal Purpose (MP)	29, 30	1520.26	Private	8.21	5.14	13.35	PMC
58	4/58	Fire Brigade & Disaster Management (FB & DM)	29, 30	3079.49	Private	16.63	10.42	27.04	PMC
59	4/59	Bus Depot (BD)	31, 32, 34	24003.02	Private	129.62	81.18	210.80	PMC
60	4/60	Public Convenience Center (PCC)	32, 33	573.98	Private	3.10	1.94	5.04	PMC
61	4/61	Municipal Purpose (MP)	33	935.12	Private	5.05	3.16	8.21	PMC
62	4/62	Sponge Garden (SP G)	34, 35, 36, 37, 40	30151.21	Private	162.82	9.95	172.77	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
63	4/63	Play Ground (PG)	40	6575.40	Private	35.51	2.17	37.68	PMC
64	4/64	Water Tank (WT)	40	2759.87	PMC	0.00	9.33	9.33	PMC
65	4/65	Municipal Purpose (MP)	38	1529.83	PMC	0.00	5.17	5.17	PMC
66	4/66	Children Play Ground (CPG)	38	2462.51	PMC	0.00	0.81	0.81	PMC
67	4/67	Children Play Ground (CPG)	38	1305.52	Private	7.05	0.43	7.48	PMC
68	4/68	Garden (G)	55	9226.17	Private	49.82	3.04	52.87	PMC
69	4/69	Shopping Centre (SC)	56	3768.75	PMC	0.00	12.75	12.75	PMC
70	4/70	Housing for Dishoused (HFD)	57	20141.02	Private	108.76	68.12	176.88	PMC
71	4/71	Municipal Purpose (MP)	56	1469.97	Private	7.94	4.97	12.91	PMC
72	4/72	Library (L)	56	2465.41	Private	13.31	8.34	21.65	PMC
73	4/73	Water Tank (WT)	52	1364.73	PMC	0.00	4.62	4.62	PMC
74	4/74	Children Play Ground (CPG)	53	1081.82	Private	5.84	0.36	6.20	PMC
75	4/75	Municipal Purpose (MP)	53	661.44	Private	3.57	2.24	5.81	PMC
76	4/76	Municipal Purpose (MP)	36	800.00	Private	4.32	2.71	7.03	PMC
77	4/77	Dispensary & Maternity Home (D & MH)	41	4309.51	Private	23.27	14.58	37.85	PMC
78	4/78	Municipal Purpose (MP)	53	917.57	Private	4.95	3.10	8.06	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
79	4/79	Hospital (H)	52, 53	6162.24	Private	33.28	20.84	54.12	PMC
80	4/80	Municipal Purpose (MP)	52	1606.00	Private	8.67	5.43	14.10	PMC
81	4/81	Garden (G)	49, 52	3068.58	Private	16.57	1.01	17.58	PMC
82	4/82	Primary School & High School (PS & HS)	47, 49	4918.56	Private	26.56	16.63	43.20	PMC
83	4/83	Garden (G)	35, 36	4385.31	Private	23.68	1.45	25.13	PMC
84	4/84	Sports Complex (SP C)	46	20707.98	Private	111.82	70.04	181.86	PMC
85	4/85	Garden (G)	51	4446.93	Private	24.01	1.47	25.48	PMC
86	4/86	Urban Health Centre (UHC)	50	4305.73	Private	23.25	14.56	37.81	PMC
87	4/87	Children Play Ground (CPG)	48	3029.50	Private	16.36	1.00	17.36	PMC
88	4/88	Garbage Processing Plant (GPP)	42	4545.93	Private	24.55	15.37	39.92	PMC

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Sector 5: Ambegaon Budruk (Remaining)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	5/1	Park (PK)	9	998.05	Private	2.00	0.33	2.33	PMC
2	5/2	Water Tank (WT)	9	3611.83	Private	7.22	12.22	19.44	PMC
3	5/3	Play Ground (PG)	9	1580.74	Private	3.16	0.52	3.68	PMC
4	5/4	Sewerage Work (SW)	8	3961.22	Private	7.92	13.40	21.32	PMC
5	5/5	Primary School (PS)	8	4032.09	Private	8.06	13.64	21.70	PMC
6	5/6	MSEDCL	8	350.52	Private	0.70	1.19	1.89	PMC
7	5/7	Urban Forest (UF)	8	8131.75	Private	16.26	2.68	18.95	PMC
8	5/8	Urban Health Centre (UHC)	7	1576.54	Private	3.15	5.33	8.49	PMC
9	5/9	Bus Depot (BD)	10	1914.51	Private	3.83	6.48	10.30	PMC
10	5/10	Parking (P)	10	1561.96	Private	3.12	0.52	3.64	PMC
11	5/11	Library (L)	11	435.38	Private	0.87	1.47	2.34	PMC
12	5/12	Dispensary (D)	11	601.72	Private	1.20	2.04	3.24	PMC
13	5/13	Dispensary & Maternity Home (D & MH)	16	659.12	Private	1.32	2.23	3.55	PMC
14	5/14	Play Ground (PG)	11	3509.34	Private	7.02	1.16	8.18	PMC
15	5/15	Children Play Ground (CPG)	11	499.20	Private	1.00	0.16	1.16	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
16	5/16	Police Chowki (PC)	7	1426.26	Private	2.85	4.82	7.68	PMC
17	5/17	Municipal Purpose (MP)	7	578.02	Private	1.16	1.95	3.11	PMC
18	5/18	Children Play Ground (CPG)	8	1057.13	Private	2.11	0.35	2.46	PMC
19	5/19	Fire Brigade & Disaster Management (FB & DM)	5	2532.29	Private	5.06	8.56	13.63	PMC
20	5/20	Market (M)	6	1013.51	Private	2.03	3.43	5.45	PMC
21	5/21	Garden (G)	3	1529.35	Private	3.06	0.50	3.56	PMC
22	5/22	Municipal Purpose (MP)	6	582.18	Private	1.16	1.97	3.13	PMC
23	5/23	Children Play Ground (CPG)	2	912.93	Private	1.83	0.30	2.13	PMC
24	5/24	Urban Spaces (US)	2,7	1425.70	Private	2.85	0.47	3.32	PMC
25	5/25	Dispensary & Maternity Home (D & MH)	2	544.04	Private	1.09	1.84	2.93	PMC
26	5/26	Cultural Hall (CT H)	12, 13	5704.74	Private	11.41	19.29	30.70	PMC
27	5/27	Working Women Hostel (WWH)	12	2593.09	Private	5.19	8.77	13.96	PMC
28	5/28	Garden (G)	12	6111.58	Private	12.22	2.02	14.24	PMC
29	5/29	Urban Spaces (US)	15	1376.11	Private	2.75	0.45	3.21	PMC
30	5/30	Municipal Purpose (MP)	16	506.31	Private	1.01	1.71	2.72	PMC
31	5/31	Garden (G)	15	5067.21	Private	10.13	1.67	11.81	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
32	5/32	Children Play Ground (CPG)	15	240.31	Private	0.48	0.08	0.56	PMC
33	5/33	Working Women Hostel (WWH)	2	1350.49	Private	2.70	4.57	7.27	PMC
34	5/34	Urban Spaces (US)	2	572.43	Private	1.14	0.19	1.33	PMC
35	5/35	Public Housing (PH)	2	1665.21	Private	3.33	5.63	8.96	PMC
36	5/36	Dispensary & Maternity Home (D & MH)	3	1846.28	Private	3.69	6.24	9.94	PMC
37	5/37	Municipal Purpose (MP)	1	604.79	Private	1.21	2.05	3.26	PMC
38	5/38	Municipal Purpose (MP)	1	1409.45	Private	2.82	4.77	7.59	PMC
39	5/39	MSEDCL	14	965.34	Private	1.93	3.26	5.20	PMC
40	5/40	Play Ground (PG)	14	10950.75	Private	21.90	3.61	25.52	PMC
41	5/41	Municipal Purpose (MP)	36	1156.56	Private	2.31	3.91	6.22	PMC
42	5/42	Children Play Ground (CPG)	36	909.70	Private	1.82	0.30	2.12	PMC
43	5/43	Children Play Ground (CPG)	29	180.51	Private	0.36	0.06	0.42	PMC
44	5/44	Garden (G)	29	805.39	Private	1.61	0.27	1.88	PMC
45	5/45	Water Tank (WT)	64	1809.01	Private	3.62	6.12	9.74	PMC
46	5/46	Market (M)	1	983.43	Private	1.97	3.33	5.29	PMC
47	5/47	Fire Brigade & Disaster Management (FB &DM)	60, 61, 62	3546.79	Private	7.09	12.00	19.09	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
48	5/48	Children Play Ground (CPG)	3	665.01	Private	1.33	0.22	1.55	PMC
49	5/49	Children Play Ground (CPG)	4	408.82	Private	0.82	0.13	0.95	PMC
50	5/50	Police Chowki (PC)	4	789.97	Private	1.58	2.67	4.25	PMC
51	5/51	Hospital (H)	4	1194.32	Private	2.39	4.04	6.43	PMC
52	5/52	Play Ground (PG)	4	1335.99	Private	2.67	0.44	3.11	PMC
53	5/53	Children Play Ground (CPG)	4	2819.56	Private	5.64	0.93	6.57	PMC
54	5/54	Urban Forest (UF)	59	6472.38	Private	12.94	2.14	15.08	PMC
55	5/55	Garden (G)	60, 61	4772.00	Private	9.54	1.57	11.12	PMC
56	5/56	Children Play Ground (CPG)	57	1201.15	Private	2.40	0.40	2.80	PMC
57	5/57	Market (M)	57	1051.40	Private	2.10	3.56	5.66	PMC
58	5/58	Municipal Purpose (MP)	57	698.61	Private	1.40	2.36	3.76	PMC
59	5/59	Children Play Ground (CPG)	55	613.61	Private	1.23	0.20	1.43	PMC
60	5/60	Play Ground (PG)	55	2082.11	Private	4.16	0.69	4.85	PMC
61	5/61	Crematorium (CG)	54	1825.00	Private	3.65	0.60	4.25	PMC
62	5/62	Garden (G)	52	6657.89	Private	13.32	2.20	15.51	PMC
63	5/63	Nala Garden (NG)	52	254.00	Private	0.51	0.08	0.59	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
64	5/64	Nala Garden (NG)	52	439.58	Private	0.88	0.15	1.02	PMC
65	5/65	Nala Garden (NG)	52, 53	3416.20	Private	6.83	1.13	7.96	PMC
66	5/66	Public Convenience Center (PCC)	53	341.34	Private	0.68	1.15	1.84	PMC
67	5/67	MSEDCL	53	2085.98	Private	4.17	7.05	11.23	PMC
68	5/68	Play Ground (PG)	54	6368.33	Private	12.74	2.10	14.84	PMC
69	5/69	Bus Depot (BD)	55, 99, 100	6726.99	Private	13.45	22.75	36.21	PMC

Note:

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Sector 6: Ambegaon Khurd (Remaining)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	6/1	Children Play Ground (CPG)	101	691.58	Private	3.32	0.23	3.55	PMC
2	6/2	Garden (G)	2	1793.33	Private	8.61	0.59	9.20	PMC
3	6/3	Nala Garden (NG)	2,3,4	3372.79	Private	16.19	1.11	17.30	PMC
4	6/4	Burial Ground (BG)	4	1456.79	Private	6.99	0.48	7.47	PMC
5	6/5	Play Ground (PG)	1	8015.22	Private	38.47	2.65	41.12	PMC
6	6/6	Primary School (PS)	101	1903.57	Private	9.14	6.44	15.58	PMC
7	6/7	Police Chowki (PC)	97	851.03	Private	4.08	2.88	6.96	PMC
8	6/8	Municipal Purpose (MP)	102	443.68	Private	2.13	1.50	3.63	PMC
9	6/9	Municipal Purpose (MP)	17	642.68	Private	3.08	2.17	5.26	PMC
10	6/10	Garden (G)	16	11006.58	Private	52.83	3.63	56.46	PMC
11	6/11	Public Housing (PH)	15	843.46	Private	4.05	2.85	6.90	PMC
12	6/12	Dispensary (D)	12	1279.55	Private	6.14	4.33	10.47	PMC
13	6/13	Park (PK)	41	5928.30	Private	28.46	1.96	30.41	PMC
14	6/14	Park (PK)	36	3628.40	Private	17.42	1.20	18.61	PMC
15	6/15	Nala Garden (NG)	11	1105.30	Government	0.00	0.36	0.36	PMC

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Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
16	6/16	Nala Garden (NG)	11	1258.67	Government	0.00	0.42	0.42	PMC
17	6/17	Primary School & High School (PS & HS)	11, 29	5001.95	Government	0.00	16.92	16.92	PMC
18	6/18	Water Tank (WT)	20	758.00	Government	0.00	2.56	2.56	PMC
19	6/19	Water Tank (WT)	20	5842.00	Government	0.00	19.76	19.76	PMC
20	6/20	Play Ground (PG)	21	4172.46	Private	20.03	1.38	21.40	PMC
21	6/21	Water Tank (WT)	94	8052.99	Private	38.65	27.24	65.89	PMC
22	6/22	Fire Brigade & Disaster Management (FB & DM)	30	1640.07	Private	7.87	5.55	13.42	PMC
23	6/23	Primary School (PS)	62	2167.86	Private	10.41	7.33	17.74	PMC
24	6/24	Play Ground (PG)	62	7774.96	Private	37.32	2.57	39.89	PMC
25	6/25	Municipal Purpose (MP)	62	718.96	Private	3.45	2.43	5.88	PMC
26	6/26	Water Tank (WT)	62	1176.31	Private	5.65	3.98	9.62	PMC
27	6/27	Garden (G)	62	2001.72	Private	9.61	0.66	10.27	PMC
28	6/28	Market (M)	62	1024.04	Private	4.92	3.46	8.38	PMC
29	6/29	Municipal Purpose (MP)	62	596.68	Private	2.86	2.02	4.88	PMC
30	6/30	MSEDCL	62	712.42	Private	3.42	2.41	5.83	PMC
31	6/31	Public Convenience Center (PCC)	63	492.53	Private	2.36	1.67	4.03	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
32	6/32	Primary School (PS)	63	4104.09	Private	19.70	13.88	33.58	PMC
33	6/33	Children Play Ground (CPG)	59	600.75	Private	2.88	0.20	3.08	PMC
34	6/34	Urban Forest (UF)	63	4332.36	Private	20.80	1.43	22.22	PMC
35	6/35	Children Play Ground (CPG)	59	169.37	Private	0.81	0.06	0.87	PMC
36	6/36	Park (PK)	59	7708.89	Private	37.00	2.54	39.55	PMC

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Sector 7: Dhayari (Remaining)

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	7/1	Shopping Centre (SC)	127	2781.97	Private	14.19	9.41	23.60	PMC
2	7/2	Children Play Ground (CPG)	127	1984.14	Private	10.12	0.65	10.77	PMC
3	7/3	Library & Town Hall (L & TH)	116	3007.72	Private	15.34	10.17	25.51	PMC
4	7/4	Sewerage Work (SW)	115, 117	10373.21	Private	52.90	35.08	87.99	PMC
5	7/5	Dispensary & Maternity Home (D & MH)	117	1884.26	Private	9.61	6.37	15.98	PMC
6	7/6	Garden (G)	125	955.68	Private	4.87	0.32	5.19	PMC
7	7/7	Primary School & High School (PS & HS)	125	2715.16	Private	13.85	9.18	23.03	PMC
8	7/8	Urban Spaces (US)	125	1584.51	Private	8.08	0.52	8.60	PMC
9	7/9	Post Office (PO)	125	654.67	Private	3.34	2.21	5.55	PMC
10	7/10	Water Tank (WT)	125	4489.89	Private	22.90	15.19	38.08	PMC
11	7/11	Garden (G)	124, 125	9435.04	Private	48.12	3.11	51.23	PMC
12	7/12	Water Tank (WT)	124, 126	8475.67	Private	43.23	28.67	71.89	PMC
13	7/13	Play Ground (PG)	123	6866.99	Private	35.02	2.27	37.29	PMC
14	7/14	Garden (G)	106, 107, 108, 109, 110	16326.46	Private	83.26	5.39	88.65	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
15	7/15	Bus Depot (BD)	99, 121, 122	23725.55	Private	121.00	80.24	201.24	PMC
16	7/16	Truck Terminus (TT)	99, 122	13046.40	Private	66.54	4.31	70.84	PMC
17	7/17	Public Convenience Center (PCC)	98, 99	1519.32	Private	7.75	5.14	12.89	PMC
18	7/18	Hospital (H)	100	4476.97	Private	22.83	15.14	37.97	PMC
19	7/19	Garden (G)	96, 97, 98, 103	39846.19	Private	203.22	13.15	216.36	PMC
20	7/20	Bus Depot (BD)	102, 103	20686.36	Private	105.50	69.96	175.46	PMC
21	7/21	Shopping Centre (SC)	105	4023.53	Private	20.52	13.61	34.13	PMC
22	7/22	Public Convenience Center (PCC)	10	353.61	Private	1.80	1.20	3.00	PMC
23	7/23	Play Ground (PG)	2	3162.77	Private	16.13	1.04	17.17	PMC
24	7/24	Children Play Ground (CPG)	5	330.97	Private	1.69	0.11	1.80	PMC
25	7/25	Municipal Purpose (MP)	2	813.70	Private	4.15	2.75	6.90	PMC
26	7/26	Children Play Ground (CPG)	3	735.01	Private	3.75	0.24	3.99	PMC
27	7/27	Children Play Ground (CPG)	5	562.14	Private	2.87	0.19	3.05	PMC
28	7/28	Library (L)	2, 5	292.13	Private	1.49	0.99	2.48	PMC
29	7/29	Fire Brigade & Disaster Management (FB & DM)	4	3326.97	Private	16.97	11.25	28.22	PMC
30	7/30	Children Play Ground (CPG)	5	1856.77	Private	9.47	0.61	10.08	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
31	7/31	Dispensary & Maternity Home (D & MH)	8	2266.79	Private	11.56	7.67	19.23	PMC
32	7/32	Shopping Centre (SC)	7, 8	2232.46	Private	11.39	7.55	18.94	PMC
33	7/33	Parking (P)	6	1302.42	Private	6.64	0.43	7.07	PMC
34	7/34	Nala Garden (NG)	28, 29, 30	4443.98	Private	22.66	1.47	24.13	PMC
35	7/35	Dispensary (D)	30	485.08	Private	2.47	1.64	4.11	PMC
36	7/36	Public Convenience Center (PCC)	30	261.34	Private	1.33	0.88	2.22	PMC
37	7/37	Nala Garden (NG)	30	1182.08	Private	6.03	0.39	6.42	PMC
38	7/38	Nala Garden (NG)	30	2651.04	Private	13.52	0.87	14.40	PMC
39	7/39	Nala Garden (NG)	45	868.44	Private	4.43	0.29	4.72	PMC
40	7/40	Urban Spaces (US)	48	2525.00	Private	12.88	0.83	13.71	PMC
41	7/41	Children Play Ground (CPG)	47	1796.67	Private	9.16	0.59	9.76	PMC
42	7/42	Dispensary & Maternity Home (D & MH)	47	2012.76	Private	10.27	6.81	17.07	PMC
43	7/43	Play Ground (PG)	49	6300.96	Government	0.00	2.08	2.08	PMC
44	7/44	Water Tank (WT)	49	6098.30	Government	0.00	20.62	20.62	PMC
45	7/45	Primary School & High School (PS & HS)	49	15213.19	Government	0.00	51.45	51.45	PMC
46	7/46	Garden (G)	49	20111.50	Government	0.00	6.64	6.64	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
47	7/47	Public Housing (PH)	49, 175	9610.29	Government	0.00	32.50	32.50	PMC
48	7/48	Parking (P)	49	1862.93	Government	0.00	0.61	0.61	PMC
49	7/49	Public Convenience Center (PCC)	49	1395.09	Government	0.00	4.72	4.72	PMC
50	7/50	Crematorium (CG)	50	6631.15	Government	0.00	2.19	2.19	PMC
51	7/51	Dispensary (D)	51	436.91	Private	2.23	1.48	3.71	PMC
52	7/52	Shopping Centre (SC)	51	1977.89	Private	10.09	6.69	16.78	PMC
53	7/53	Public Convenience Center (PCC)	51	505.92	Private	2.58	1.71	4.29	PMC
54	7/54	Dispensary & Maternity Home (D & MH)	52	2520.02	Private	12.85	8.52	21.37	PMC
55	7/55	Library (L)	51	482.76	Private	2.46	1.63	4.09	PMC
56	7/56	Children Play Ground (CPG)	51	1230.39	Private	6.27	0.41	6.68	PMC
57	7/57	Children Play Ground (CPG)	53	510.06	Private	2.60	0.17	2.77	PMC
58	7/58	Nala Garden (NG)	54	2463.97	Private	12.57	0.81	13.38	PMC
59	7/59	Play Ground (PG)	55	10097.47	Private	51.50	3.33	54.83	PMC
60	7/60	Nala Garden (NG)	71	1590.61	Private	8.11	0.52	8.64	PMC
61	7/61	Police Chowki (PC)	42, 44	857.25	Private	4.37	2.90	7.27	PMC
62	7/62	Water Tank (WT)	42, 44	2159.76	Private	11.01	7.30	18.32	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
63	7/63	Primary School & High School (PS & HS)	44	16423.76	Private	83.76	55.55	139.31	PMC
64	7/64	Nala Garden (NG)	31	7564.05	Private	38.58	2.50	41.07	PMC
65	7/65	Nala Garden (NG)	32	6417.22	Private	32.73	2.12	34.85	PMC
66	7/66	Nala Garden (NG)	55, 56	8297.06	Private	42.32	2.74	45.05	PMC
67	7/67	Nala Garden (NG)	70	7223.73	Private	36.84	2.38	39.22	PMC
68	7/68	Public Housing (PH)	71, 72	20580.37	Private	104.96	69.60	174.56	PMC
69	7/69	Primary School (PS)	64	4074.62	Private	20.78	13.78	34.56	PMC
70	7/70	Sports Centre (SP C)	66, 71	33233.14	Private	169.49	112.40	281.89	PMC
71	7/71	Water Tank (WT)	69	2027.17	Private	10.34	6.86	17.19	PMC
72	7/72	Water Tank (WT)	34	3867.10	Government	0.00	13.08	13.08	PMC
73	7/73	Play Ground (PG)	40	18178.16	Private	92.71	6.00	98.71	PMC
74	7/74	Crematorium (CG)	59	6293.89	Government	0.00	2.08	2.08	PMC
75	7/75	Municipal Housing (MUH)	67	29824.62	Private	152.11	100.87	252.97	PMC
76	7/76	High School (HS)	76	6188.56	Private	31.56	20.93	52.49	PMC
77	7/77	Garden (G)	79	5212.87	Private	26.59	1.72	28.31	PMC
78	7/78	Garden (G)	92	10745.36	Private	54.80	3.55	58.35	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
79	7/79	Burial Ground for Animals (BGA)	80	6546.13	Private	33.39	2.16	35.55	PMC
80	7/80	Garbage Processing Plant (GPP)	80, 89	30419.94	Private	155.14	102.88	258.02	PMC
81	7/81	Primary School (PS)	76	2840.47	Private	14.49	9.61	24.09	PMC
82	7/82	Garden (G)	63	10457.41	Private	53.33	3.45	56.78	PMC
83	7/83	Water Tank (WT)	77, 63	7874.82	Private	40.16	26.63	66.79	PMC
84	7/84	Nala Garden (NG)	69,70	1550.46	Private	7.91	0.51	8.42	PMC
85	7/85	Nala Garden (NG)	56, 57	1682.27	Private	8.58	0.56	9.13	PMC
86	7/86	Nala Garden (NG)	59,69	1706.12	Private	8.70	0.56	9.26	PMC
87	7/87	Nala Garden (NG)	40, 57, 58,	2174.24	Private	11.09	0.72	11.81	PMC
88	7/88	Nala Garden (NG)	32, 35	2006.97	Private	10.24	0.66	10.90	PMC
89	7/89	Nala Garden (NG)	31	959.11	Private	4.89	0.32	5.21	

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Sector 8: Shivane (Remaining) & Shivane-Uttam Nagar

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
1	8/1	Water Tank (WT)	105	4429.54	Private	15.95	14.98	30.93	PMC
2	8/2	Garden (G)	102, 105	7520.69	Private	27.07	2.48	29.56	PMC
3	8/3	Play Ground (PG)	102	4167.31	Private	15.00	1.38	16.38	PMC
4	8/4	Children Play Ground (CPG)	17P	504.75	Private	1.82	0.17	1.98	PMC
5	8/5	Primary School & High School (PS & HS)	11, 13	4431.09	Private	15.95	14.99	30.94	PMC
6	8/6	Market (M)	11	952.12	Private	3.43	3.22	6.65	PMC
7	8/7	Garden (G)	11	4209.04	Private	15.15	1.39	16.54	PMC
8	8/8	Dispensary and Maternity Home (D & MH)	9	4217.03	Private	15.18	14.26	29.44	PMC
9	8/9	Play Ground (PG)	3, 11, 15	8349.52	Private	30.06	2.76	32.81	PMC
10	8/10	Public Housing (PH)	15, 16	34648.32	Government	0.00	117.18	117.18	PMC
11	8/11	Primary School & High School (PS & HS)	4	6997.13	Private	25.19	23.66	48.85	PMC
12	8/12	Children Play Ground (CPG)	5A	1497.11	Private	5.39	0.49	5.88	PMC
13	8/13	Play Ground (PG)	5A	4580.98	Private	16.49	1.51	18.00	PMC
14	8/14	Post Office (PO)	5A	563.83	Private	2.03	1.91	3.94	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
15	8/15	Shopping Centre (SC)	2, 3, Gaothan	2045.14	Private	7.36	6.92	14.28	PMC
16	8/16	Municipal Office (MO)	68	3941.26	Private	14.19	13.33	27.52	PMC
17	8/17	Children Play Ground (CPG)	68	961.23	Private	3.46	0.32	3.78	PMC
18	8/18	Police Chowki (PC)	93	986.87	Private	3.55	3.34	6.89	PMC
19	8/19	Fire Brigade & Disaster Management (FB & DM)	93	1374.22	Private	4.95	4.65	9.59	PMC
20	8/20	Children Play Ground (CPG)	85	462.03	Private	1.66	0.15	1.82	PMC
21	8/21	Play Ground (PG)	84	4499.39	Private	16.20	1.48	17.68	PMC
22	8/22	Parking (P)	84, 85	3466.36	Private	12.48	1.14	13.62	PMC
23	8/23	Shopping Centre (SC)	85	1742.65	Private	6.27	5.89	12.17	PMC
24	8/24	Primary School (PS)	85	1392.70	Private	5.01	4.71	9.72	PMC
25	8/25	Play Ground (PG)	85	10927.00	Private	39.34	3.61	42.94	PMC
26	8/26	Crematorium (CG)	85	4718.36	Private	16.99	1.56	18.54	PMC
27	8/27	Burial Ground (BG)	85	2759.53	Private	9.93	0.91	10.84	PMC
28	8/28	Play Ground (PG)	82	3601.71	Private	12.97	1.19	14.15	PMC
29	8/29	Garbage Processing Plant (GPP)	81	2180.48	Private	7.85	7.37	15.22	PMC

Sr. No.	Res. No.	Purpose of Reservation	Survey No.	Area (Sq. m)	Land Ownership	Cost of Acquisition (Cr)	Cost of Development (Cr)	Total Cost (Cr)	Acquiring Authority
30	8/30	Dispensary & Maternity Home (D & MH)	81	3618.58	Private	13.03	12.24	25.27	PMC
31	8/31	Parking (P)	81	3646.77	Private	13.13	1.20	14.33	PMC
32	8/32	Primary School & High School (PS & HS)	79	13750.14	Private	49.50	46.50	96.00	PMC
33	8/33	Shopping Centre (SC)	79	2712.26	Private	9.76	9.17	18.94	PMC
34	8/34	Park (PK)	80	94597.25	Private	340.55	31.22	371.77	PMC

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