Pune Municipal Corporation

Pune Municipal Corporation 1959

Pune Municipal Corporation 2011

About Pune …

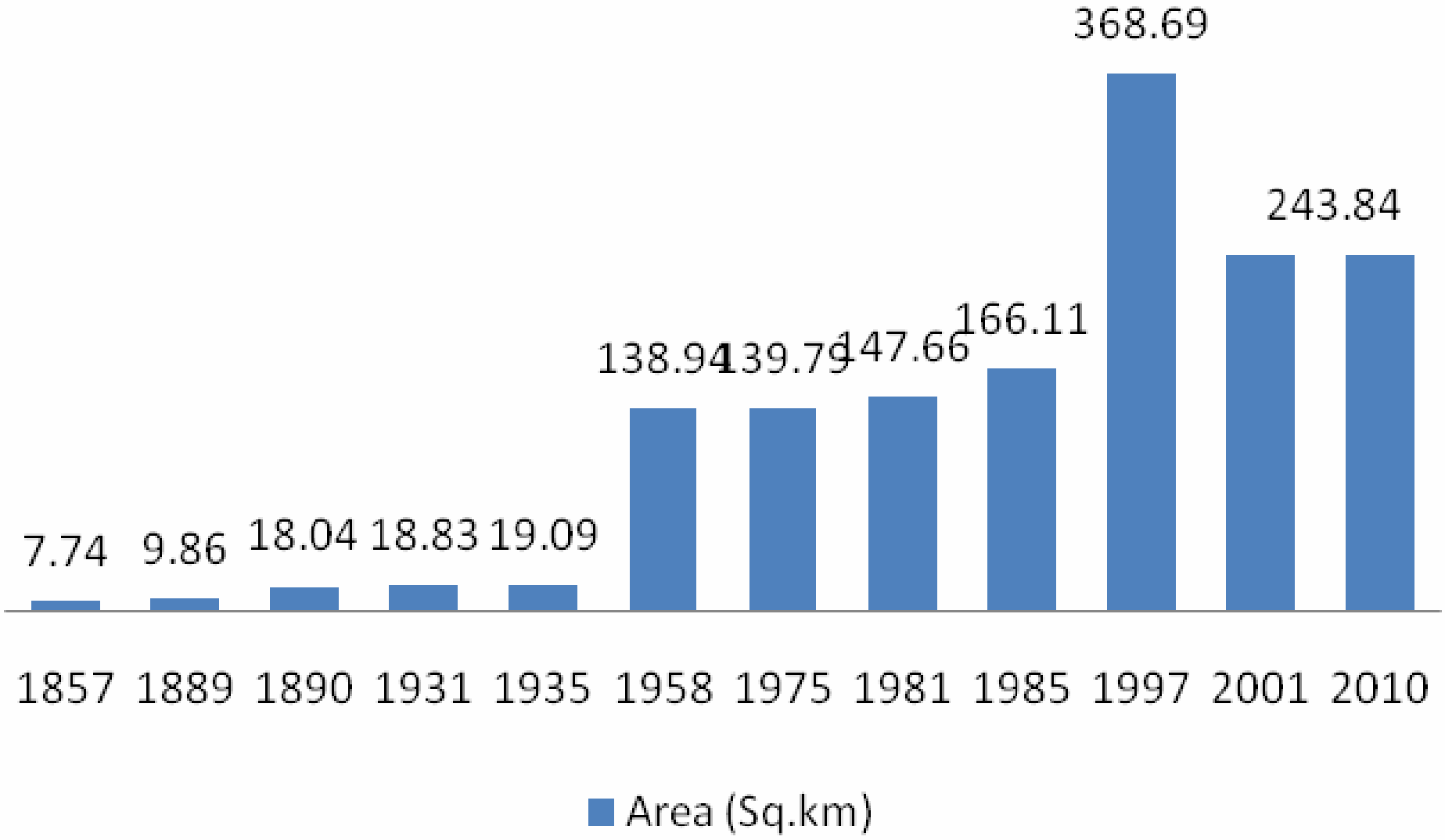
- Pune is known to have existed as a town since 937 AD. Pune was originally called Punawadi.
- During British era, it served as a cantonment town and as the "monsoon capital".
- Pune is said to be the cultural capital of the state of Maharashtra.
- As one of the largest cities in India, and as a result of its many colleges and universities, Pune is emerging as a prominent location for IT and manufacturing companies to expand.

City Statistics

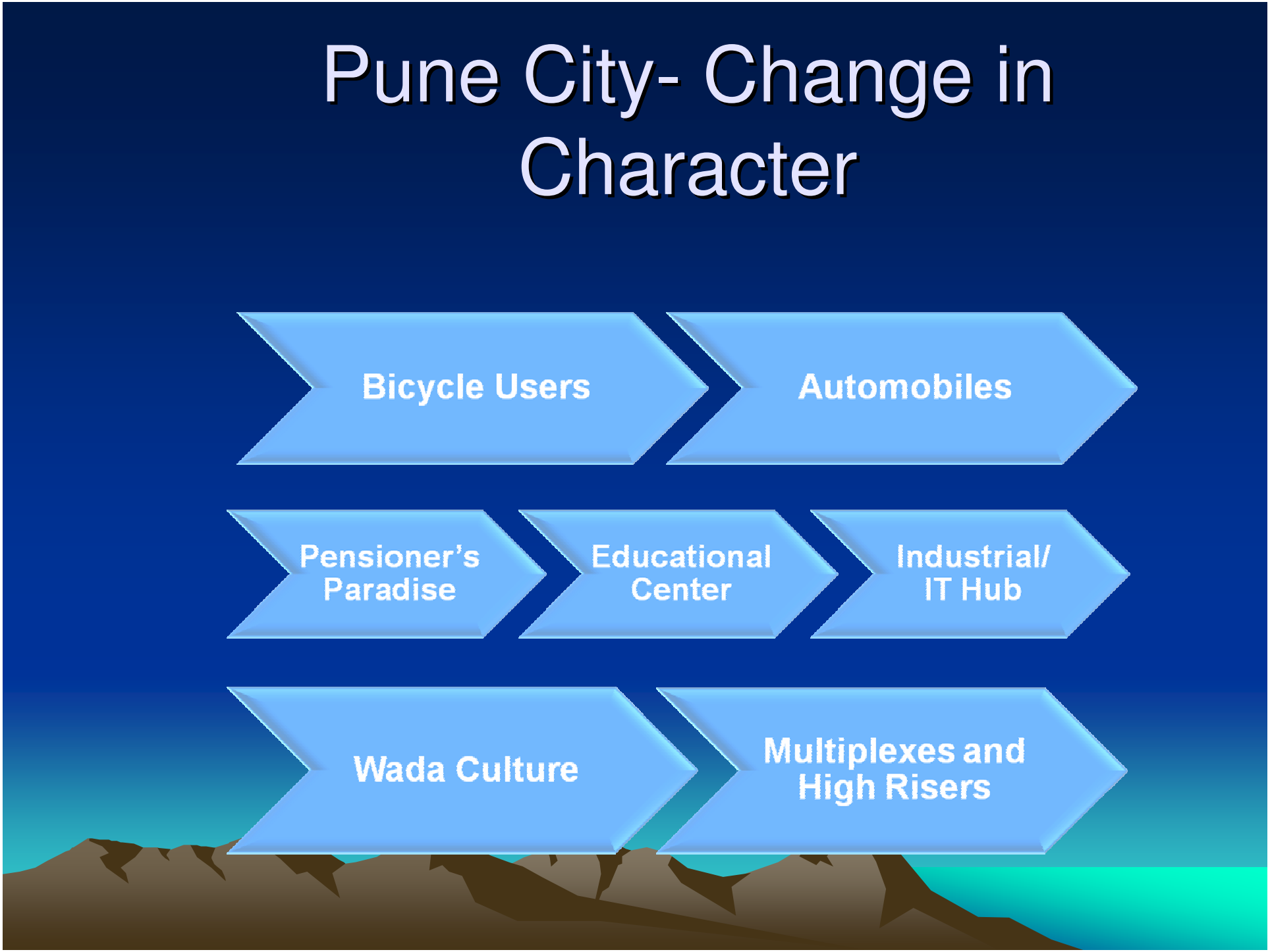
- Total Area - 243.84 sq km
- Population as per census 2001 - 25.26 lakhs
- Population as on 2011 (provisional) – 31.15 lakhs
- Total Water Supply 1232 MLD
- Solid Waste generated: 1300- 1400 MT/ day
- Sewage generation: 567 MLD
- Total length of roads 1922 km
- No. of registered vehicles : 20,880,932
- No. of gardens 111

Average Climate	
1.Summer:	22 ºC – 41 ºC
1.Winter:	8 ºC – 25 ºC
1.Rainfall:	650 – 700 mm
Altitude:	560 Meters above Sea Level

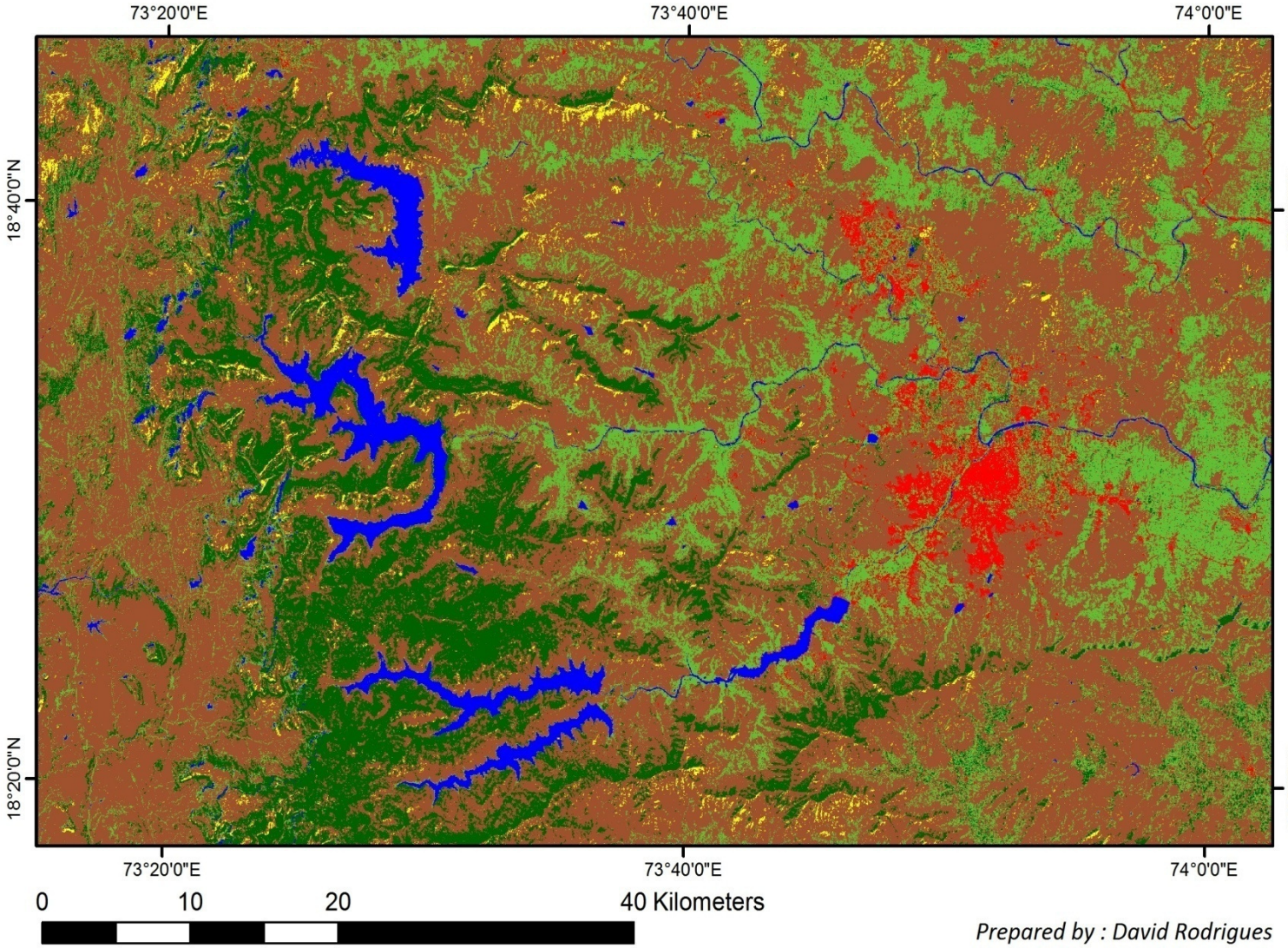
Extension of city limits



Pune City- Change in Character



Pune Land-Cover Map 1992



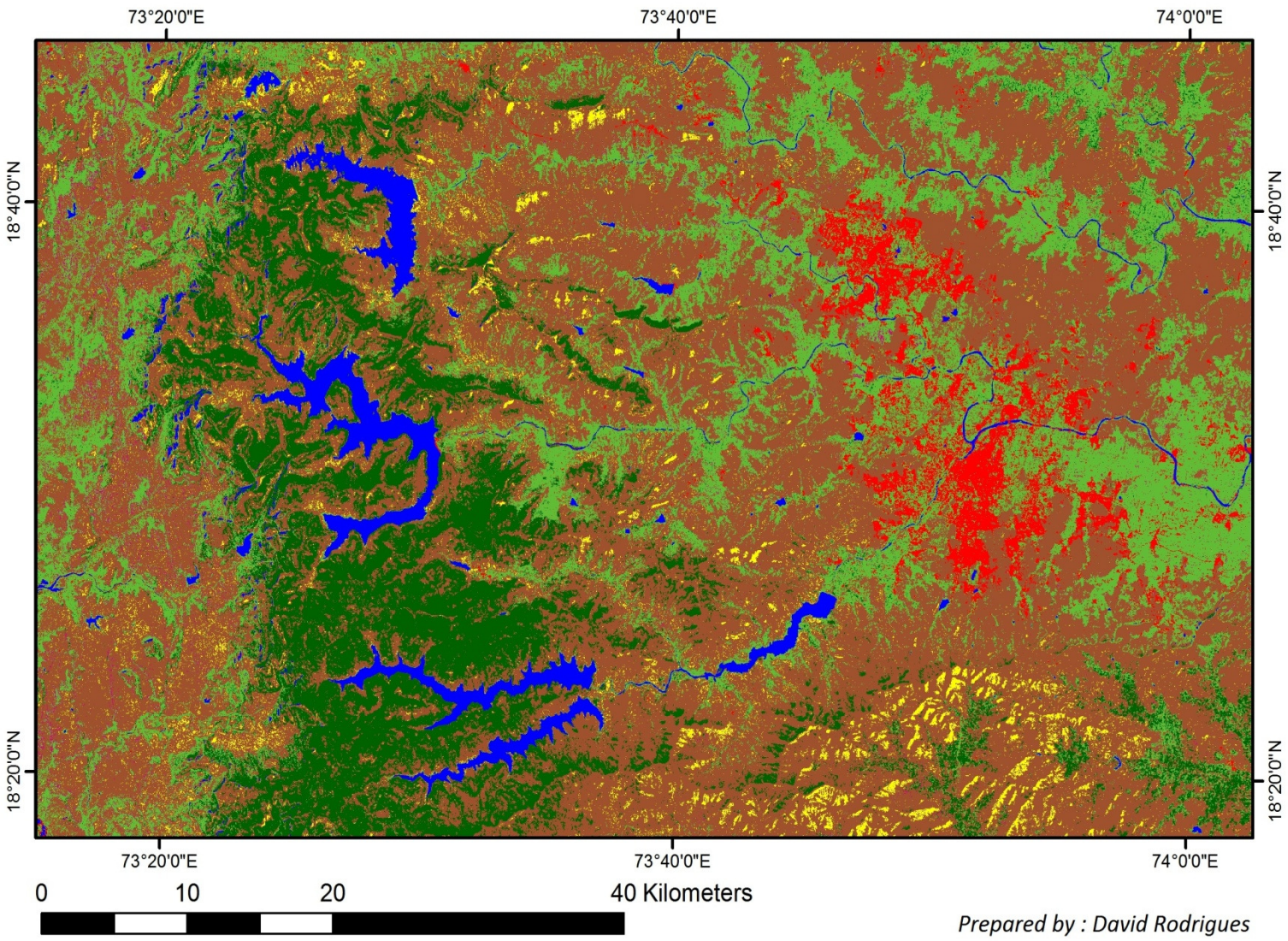
N

Legend

- Agriculture
- Barren Land
- Built Up
- Sugarcane
- Scrub Land
- Forest
- Water

Prepared by : David Rodrigues

Pune Land-Cover Map 1999



N

Legend

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- Barren Land
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- Scrub Land
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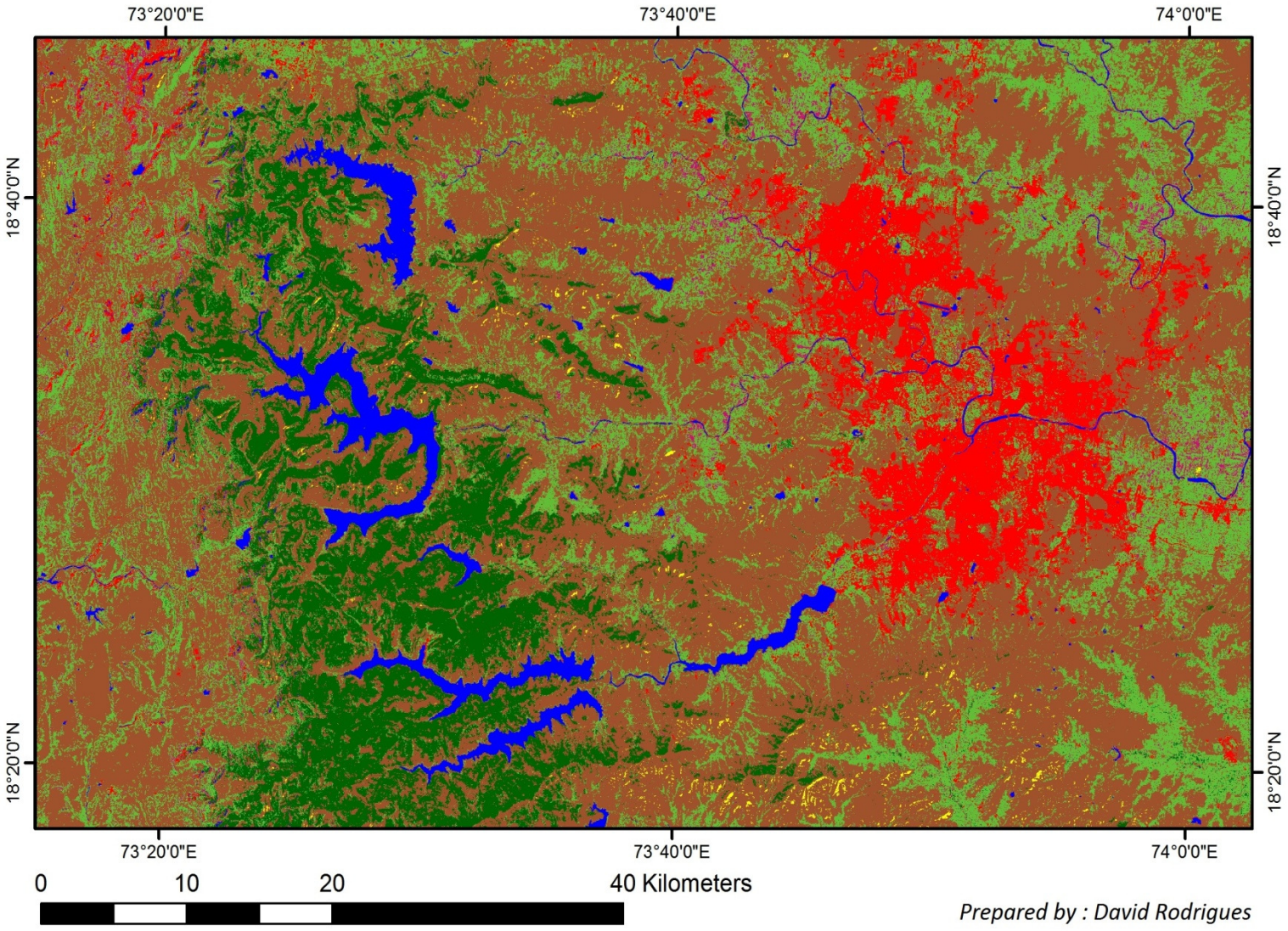
- Water

Prepared by : David Rodrigues

Pune Land-Cover Map 2011



N

Legend

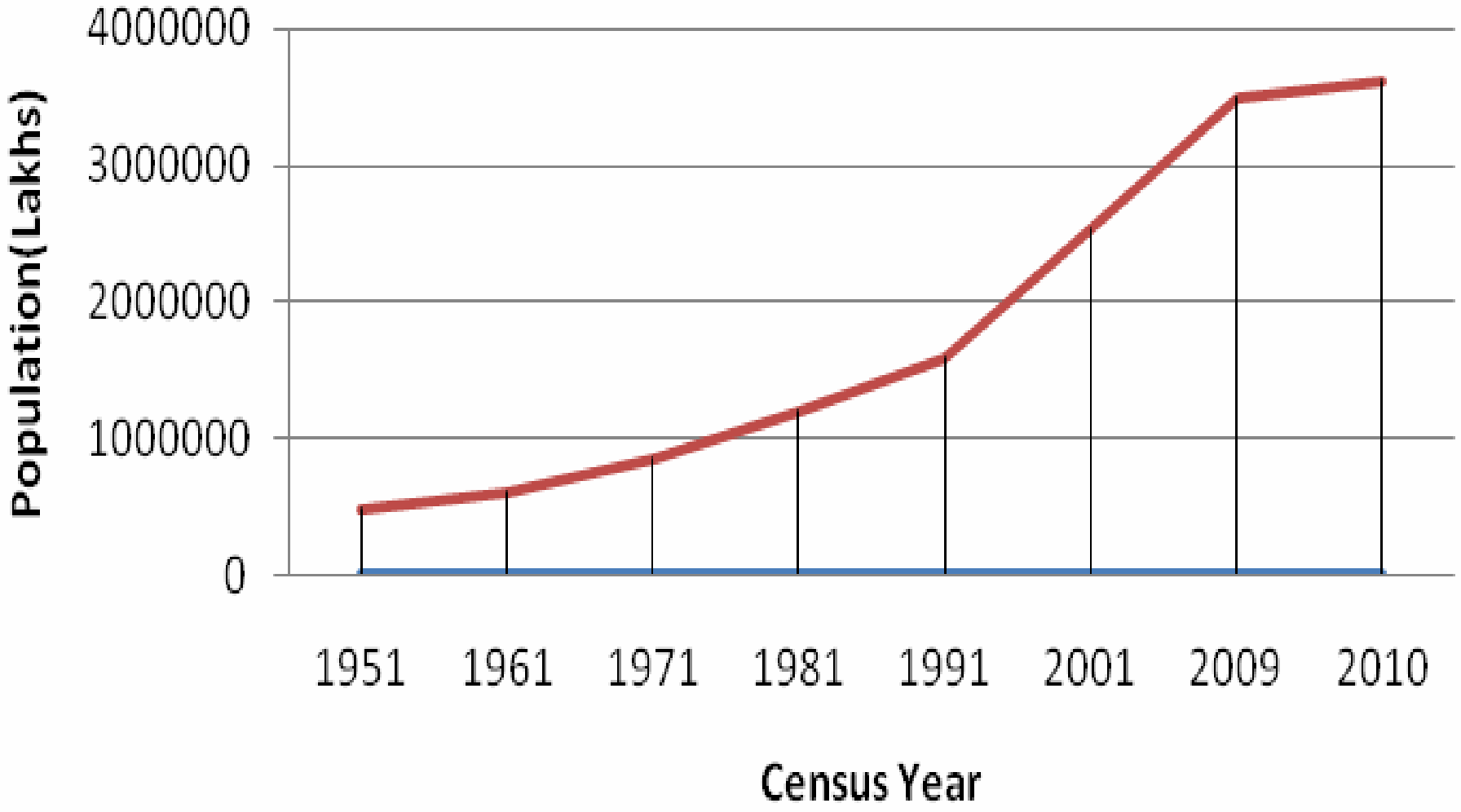
- Agriculture
- Barren Land
- Built Up
- Sugarcane
- Scrub Land
- Forest
- Water

Prepared by : David Rodrigues

GROWTH OF PUNE CITY AREA

LANDUSE PATTERNS ENVISAGED IN DEVELOPMENT PLANS				
	1987 OLD AREA	% distribution	**2005 NEW AREA**	% distribution
Residential	50.58	36.55	103.74	42.52
Commercial	2.35	1.7	3.93	1.61
Industrial	7.26	5.25	9.88	4.05
Public & Semi public	15.22	11	16.67	6.83
Public Utilities	1.38	1	1.38	0.57
Transport	22	15.9	31.82	13.04
Reserved Forest and Agricultural	2.35	1.7	29.05	11.91
Water bodies	12.06	8.7	14.52	5.95
Hills and Hill slopes	12.45	9	12.45	5.11
Recreational	12.73	9.2	20.52	8.41
TOTAL	**138.38**	**100**	**243.96**	**100**

POPULATION GROWTH



Population growth and Area increase in Pune city

Census Year	Population	Area (in sq km)
1951	4,88,419	125.00
1961	6,06,777	125.00
1971	8,56,105	138.76
1981	12,03,363	146.00
1991	16,91,430	146.00
2001	25,38,473	243.84
2011 **31,15,431** + floating population **4,00,000**	35,15,431	243.84

A view of city from Parvati 1960

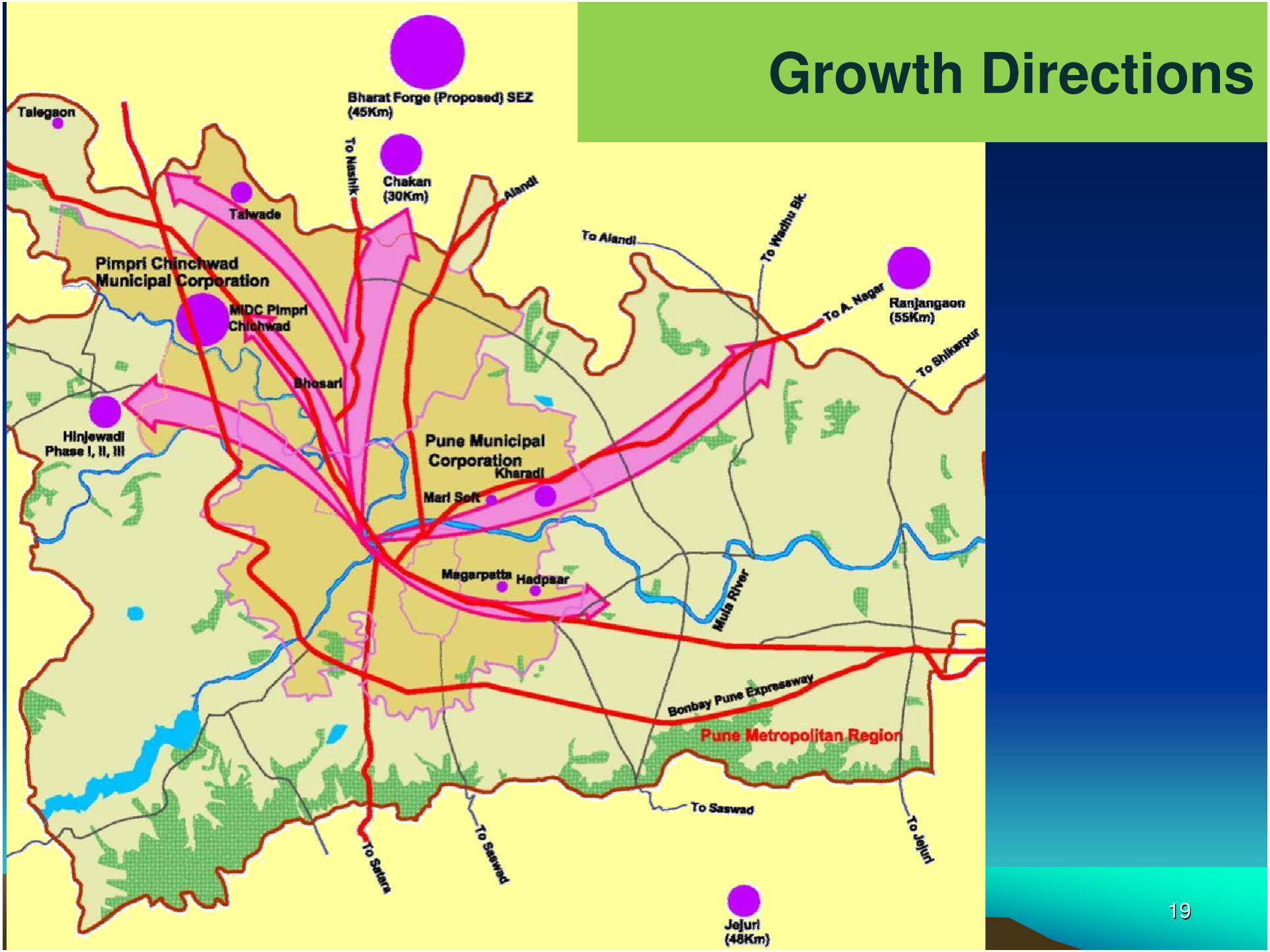
A view of the city from Parvati 2011

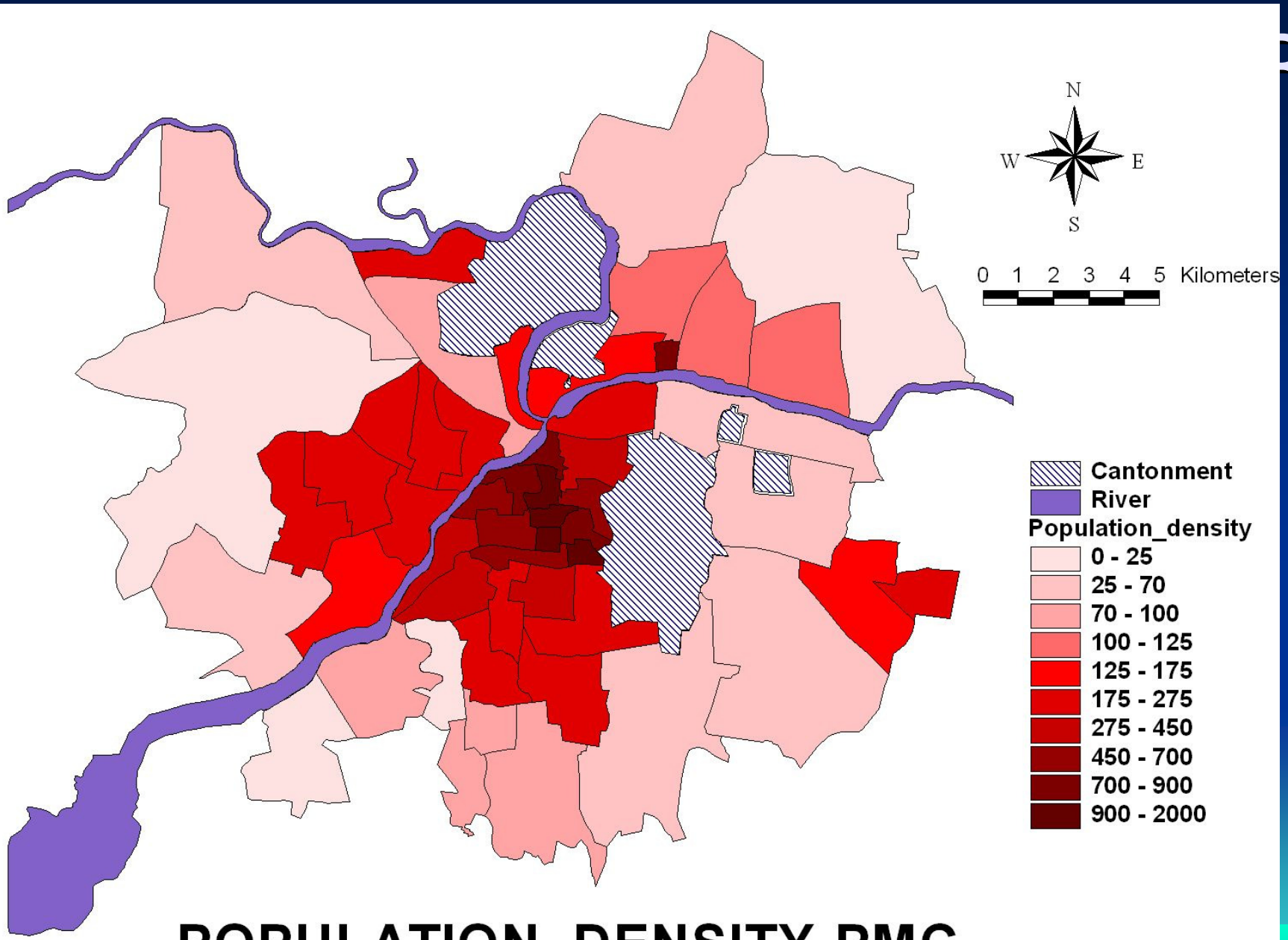
An urban sprawl in Hadapsar : 2011

Suburban growth around the periphery of Pune

Combination of urban growth synonymous with greenery - A view of J M Road, Deccan Area

Growth Directions



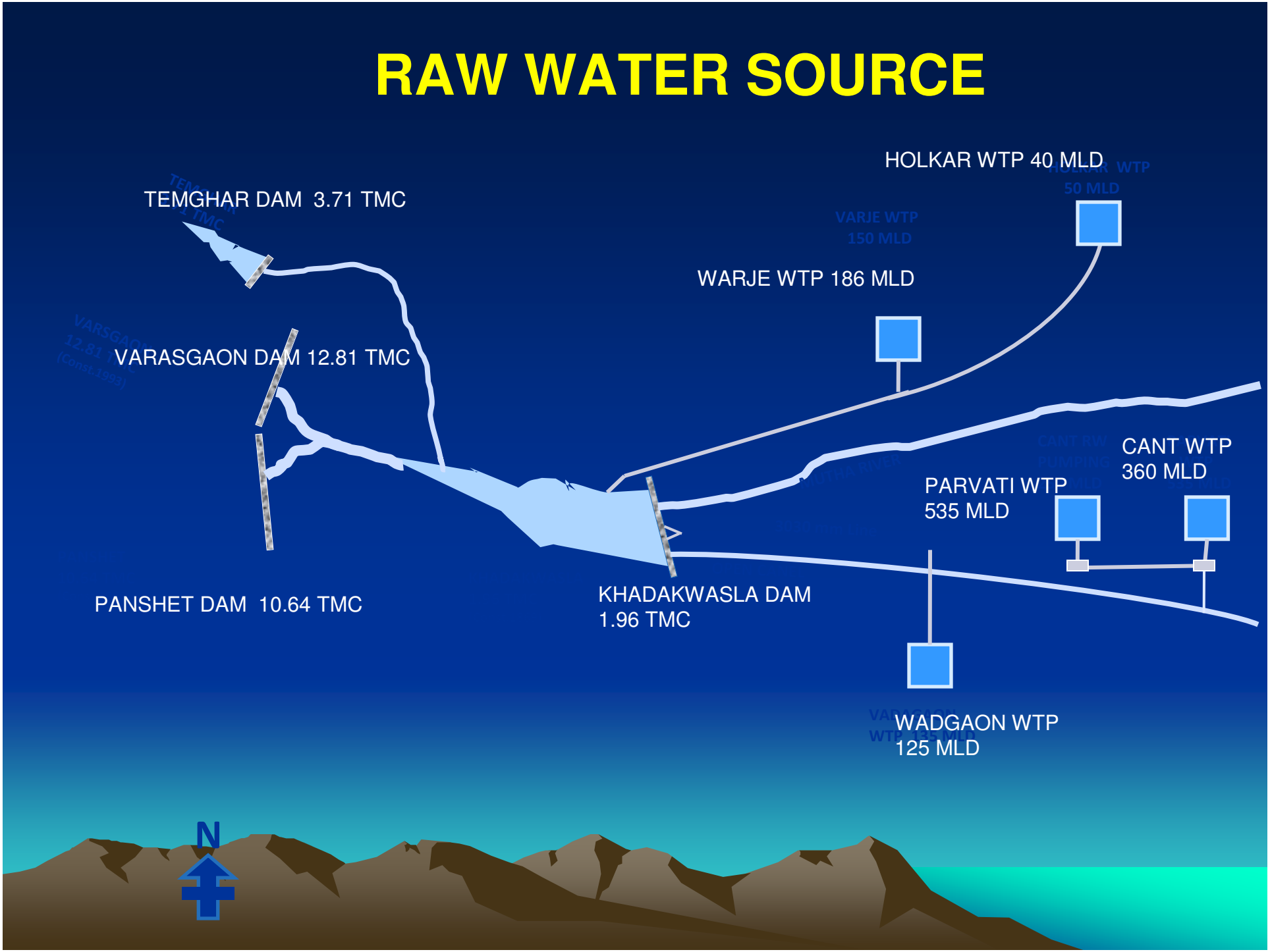


POPULATION_DENSITY-PMC

The city as a living being

Living organisms		City
Lungs	⟷	**Air quality, open space and trees**
Kidneys	⟷	**Waste water system**
Metabolism	⟷	Energy use
(Digestive tract)	⟷	
Large bowel	⟷	**Solid waste management**
Eyes and ears	⟷	Security system
Heart	⟷	City administrators
Brain	⟷	City governance
Locomotor system	⟷	Transport system
Skin	⟷	Urban fringe
Reproductive system	⟷	Population growth

RAW WATER SOURCE



WATER SUPPLY IN THE CITY

PMC draws from Khadakwasala Dam through

- 3000 mm MS gravity main
- Mutha right bank canal

Description	Capacity (mld)
Parvati Water Works	535
Cantonment Works	360
Holkar Water Works	60
Warje Water Works	186
Wagholi Water Works	26
Wadgoan Water Works	125
Total	**1292**

- Population of the city is 3.8 million
- Daily supply to the city is 1222 MLD
- Gross Per capita supply 321 lpcd
- As per PMC data actual supply is 866 MLD – or 228 LPCD
- Overall sewage generation can be estimated to be 728 MLD
- Per capita supply as per norms 150 lpcd

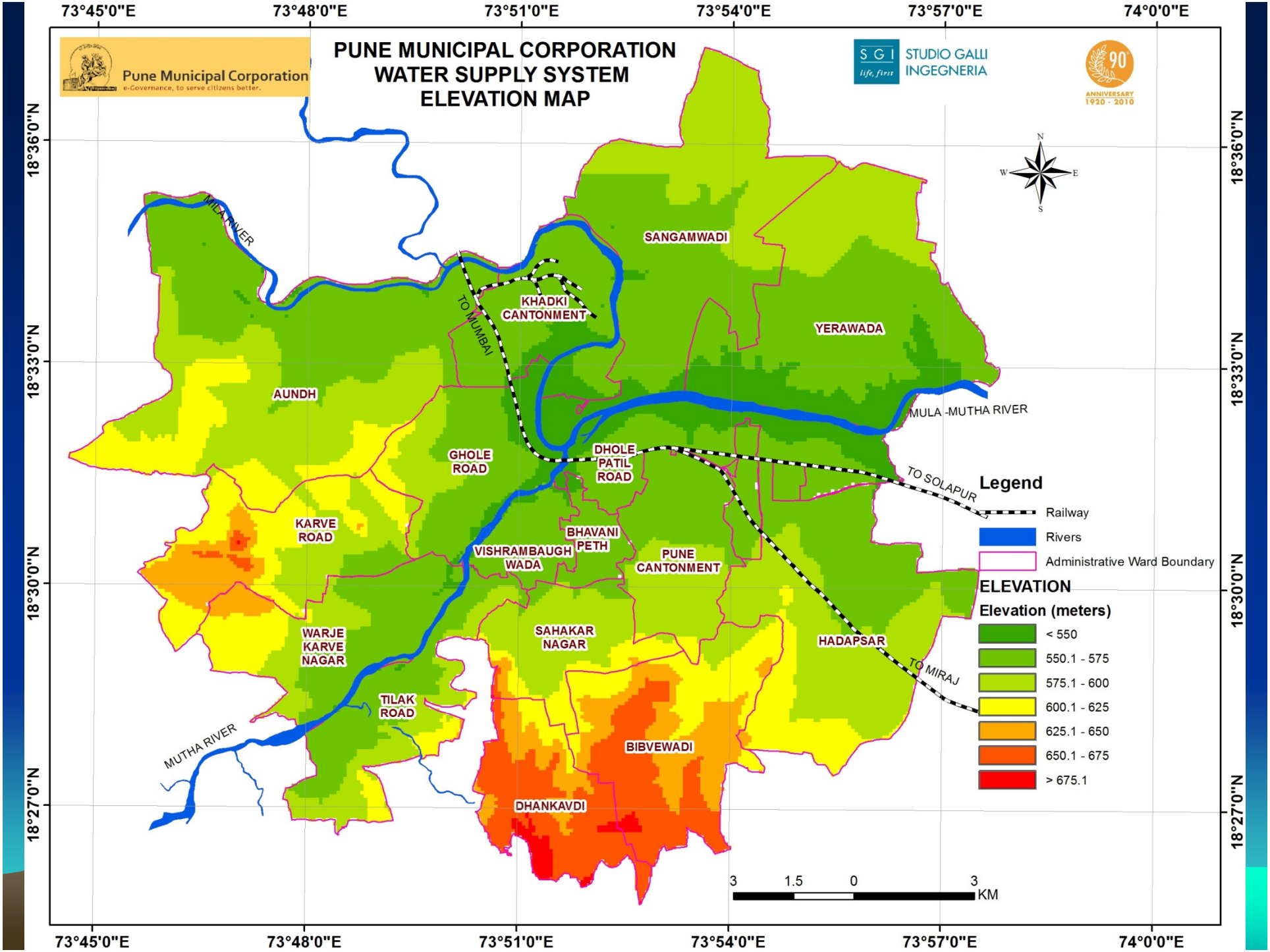
WARJE WTP

WADGAON WTP

CITY WATER DISTRIBUTION SYSTEM

CITY WATER SUPPLY DISTRIBUTION SYSTEM HAS A NETWORK OF AROUND 2500 Kms. THE PIPE SIZES IN THE WATER SUPPLY SYSTEM VARY FROM 80 mm TO 3000 mm. DUE TO UNDULATED TOPOGRAPHY OF THE CITY (SAUCCER SHAPE) THERE IS UNEQUAL WATER SUPPLY IN THE CITY. THE HOURS OF WATER SUPPLY VARY FROM 2 Hrs A DAY TO 24 Hrs WATER SUPPLY IN SOME PARTS OF THE CITY. BUT ON AN AVERAGE THERE IS 6-8 Hrs OF WATER SUPPLY ACROSS THE CITY. .

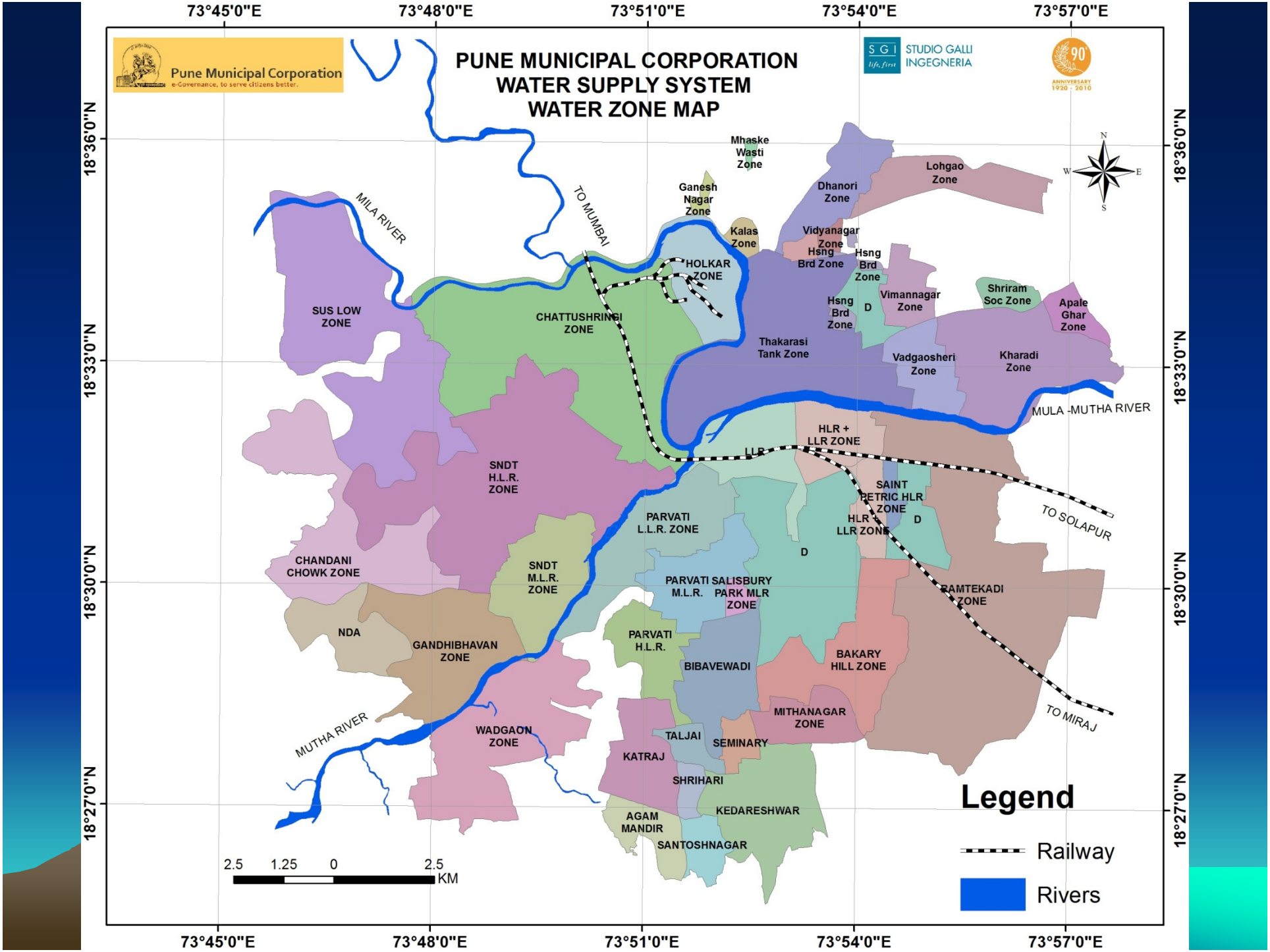
IN EXTREME CASES AND IN EMERGENCY TANKER WATER SUPPLY IS RESORTED TO


PUNE MUNICIPAL CORPORATION
WATER SUPPLY SYSTEM
ELEVATION MAP
Pune Municipal Corporation
e-Governance, to serve citizens better.
STUDIO GALLI INGEGNERIA
ANNIVERSARY 1920 - 2010
73°45'0"E
73°48'0"E
73°51'0"E
73°54'0"E
73°57'0"E
74°0'0"E
18°36'0"N
18°33'0"N
18°30'0"N
18°27'0"N
N
S
E
W
MULA RIVER
MUTHA RIVER
MULA -MUTHA RIVER
TO MUMBAI
TO SOLAPUR
TO MIRAJ
SANGAMWADI
KHADKI CANTONMENT
YERAWADA
AUNDH
GHOLE ROAD
DHOLE PATIL ROAD
KARVE ROAD
BHAVANI PETH
VISHRAMBAUGH WADA
PUNE CANTONMENT
WARJE KARVE NAGAR
SAHAKAR NAGAR
HADAPSAR
TILAK ROAD
BIBVEWADI
DHANKAVDI
Legend
Railway
Rivers
Administrative Ward Boundary
ELEVATION
Elevation (meters)
< 550
550.1 - 575
575.1 - 600
600.1 - 625
625.1 - 650
650.1 - 675
> 675.1
3 1.5 0 3
KM

WATER DISTRIBUTION ZONES

FOR THE PURPOSES OF ADMINISTRATIVE CONVENIENCE THE CITY WATER SUPPLY HAS BEEN DIVIDED INTO 3 MAJOR WATER ZONES AND EACH OF THEM BEING HEADED BY A SUPERINTENDING ENGINEER AND TEAM OF ENGINEERS. .

THE CITY HAS 48 WATER ZONES FOR WATER SUPPLY EACH OF THEM BEING CATERED BY A SEPARATE RESERVOIR. THE TOTAL STORAGE CAPACITY OF THE RESERVOIRS IS AROUND 400 MLD (APPROX 30% OF THE TOTAL DEMAND).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STUDIO GALLI INGEGNERIA
73°45'0"E
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73°51'0"E
73°54'0"E
73°57'0"E
18°36'0"N
18°33'0"N
18°30'0"N
18°27'0"N
MILA RIVER
TO MUMBAI
Mhaske Wasti Zone
Ganesh Nagar Zone
Kalas Zone
Dhanori Zone
Lohgao Zone
Vidyanagar Zone
Hsng Brd Zone
HOLKAR ZONE
SUS LOW ZONE
CHATTUSHRINGI ZONE
Vimannagar Zone
Shriram Soc Zone
Apale Ghar Zone
Thakarasi Tank Zone
Vadgaosheri Zone
Kharadi Zone
MULA -MUTHA RIVER
HLR + LLR ZONE
LLR
SNDT H.L.R. ZONE
SAINT PETRIC HLR ZONE
HLR LLR ZONE
PARVATI L.L.R. ZONE
TO SOLAPUR
CHANDANI CHOWK ZONE
SNDT M.L.R. ZONE
PARVATI SALISBURY PARK M.L.R. ZONE
SAMTEKADI ZONE
NDA
GANDHIBHAVAN ZONE
PARVATI H.L.R.
BIBAVEWADI
BAKARY HILL ZONE
MITHANAGAR ZONE
TO MIRAJ
MUTHA RIVER
WADGAON ZONE
TALJAI
SEMINARY
KATRAJ
SHRIHARI
KEDARESHWAR
AGAM MANDIR
SANTOSHNAGAR
2.5 1.25 0 2.5
KM
Legend
Railway
Rivers

AMBITIOUS ONGOING PROJECTS FOR FUTURE

- EQUITABLE WATER SUPPLY SCHEME FOR THE CITY.
- LAYING CLOSED CONDUIT OF 2500 mm Dia FROM KHADAKWASLA DAM TO CANTONMENT WATER WORKS ENROUTE PARVATI WATER WORKS TO AVOID UPTAKE FROM OPEN CANAL.
- CONSTRUCTION OF 200 MLD WATER TREATMENT PLANT AT WARJE WATER WORKS.
- LAYING CLOSED CONDUIT OF 1600 mm Dia FROM KHADAKWASLA DAM TO WARJE WATER WORKS.

PROJECTS IN PIPELINE

- CONSTRUCTION OF 500 MLD CAPACITY AT PARVATI WATER WORKS.
- CONSTRUCTION OF 250 MLD CAPACITY AT VADGAON WATER WORKS.
- IMPLEMENTATION OF EQUITABLE WATER SUPPLY SCHEME.
- CONSTRUCTION OF JACKWELL ON TH UPSTREAM OF KHADAKWASLA DAM.

FACTS ABOUT WATER SUPPLY & SEWAGE GENERATION IN PUNE CITY

	PHASE – I (2005)	PHASE – II (2010)	PHASE – III (2025)
WATER SUPPLY (MLD)	791	1050	1506
SEWAGE GENERATION (MLD)	567	700	1090

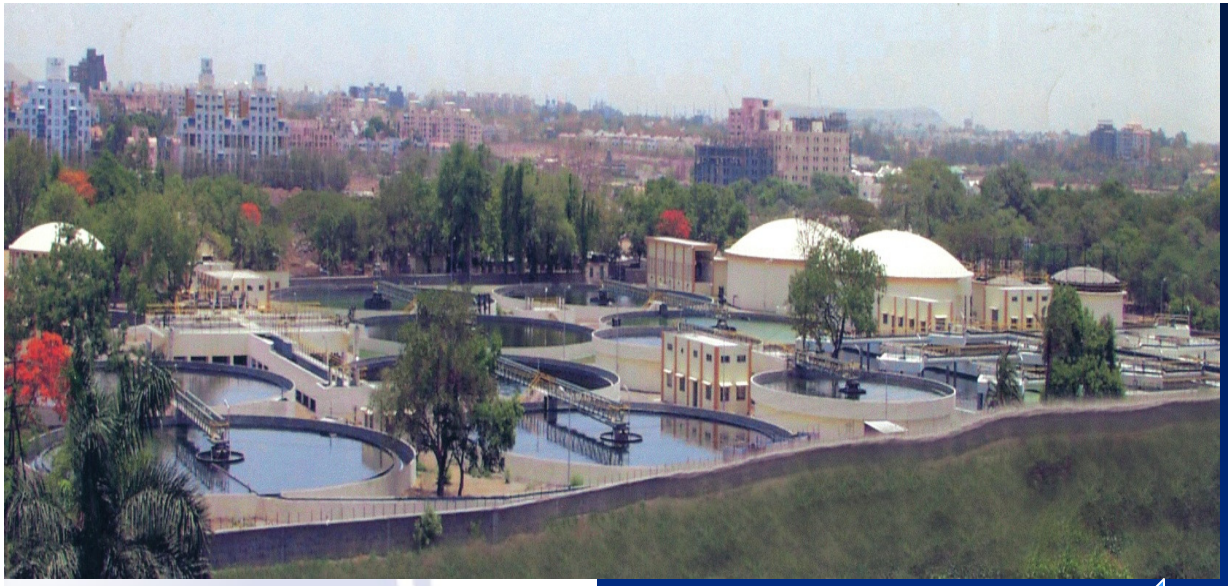
EXISTING SEWAGE TREATMENT PLANTS FUNDED BY PUNE MUNICIPAL CORPORATION

Sr.No.	Name of STP	Capacity
1	Dr.Naidu (Existing)	90 MLD
2	Bhairoba	130 MLD
3	Tanajiwadi	17 MLD
4	Erandwane	50 MLD
5	Bopodi	18 MLD
	Total	305 MLD

- All the works carried out in the phase 1 were done through internal funding of the Pune Municipal Corporation.

SEWAGE TREATMENT PLANTS
FUNDED BY JNNURM PHASE -I

Sr.No.	Name of STP	Capacity
1	Baner	30 MLD
2	Mundhwa	45 MLD
3	Kharadi	40 MLD
4	Naidu	115 MLD
5	Vithlwadi	32 MLD
	Total	262 MLD



BHAIROBA STP : 130 MLD

DATE OF COMMISSIONING : July 03

TANAJIWADI STP : 17 MLD CAPACITY
Funded by P.M.C
PROCESS :

DATE OF COMMISSIONING : April 04

MUNDHWA STP : 45 mld

PROCESS : Sequential Batch Reactor.

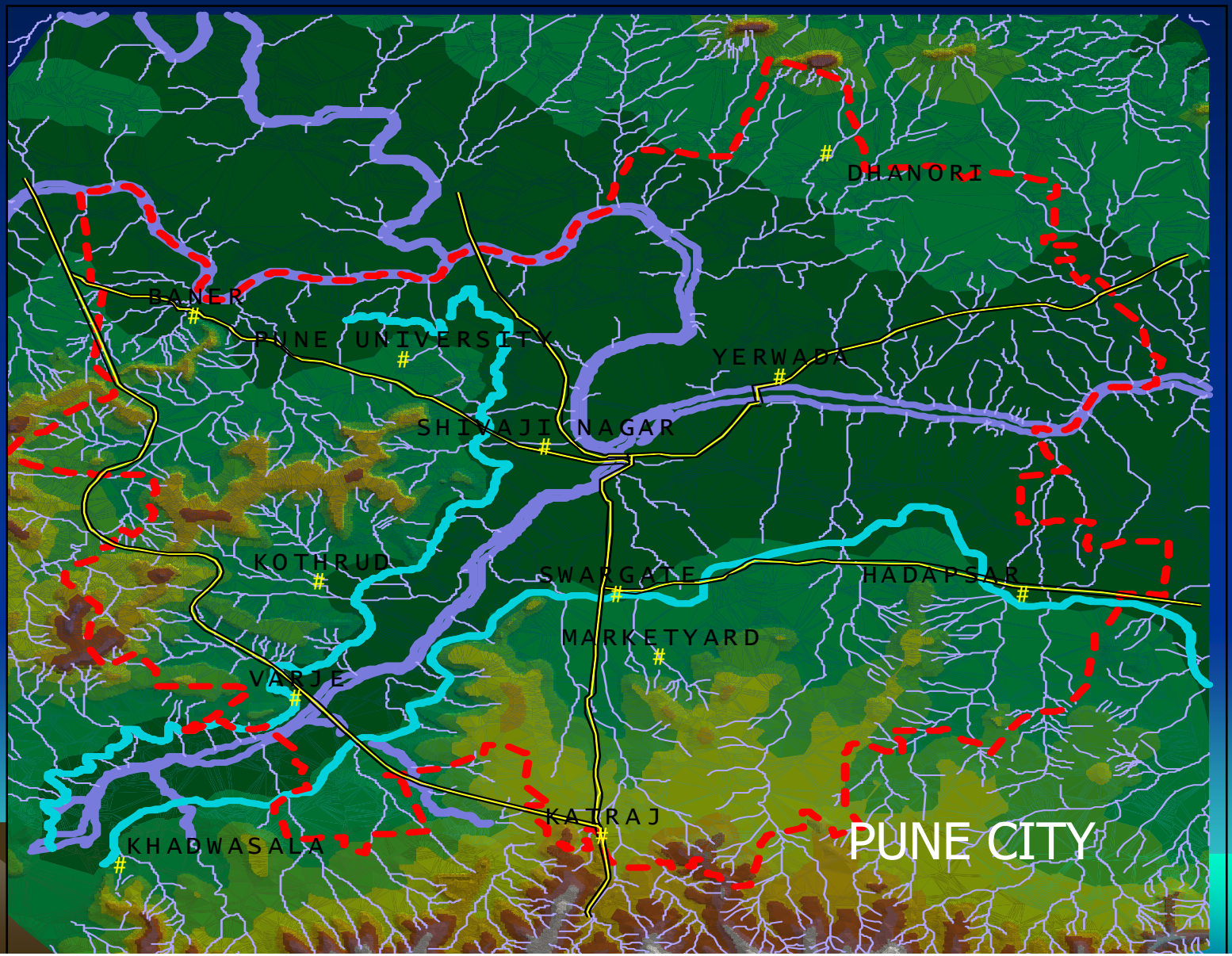
STATUS : Commissioned in March 2009

VITHHALWADI STP : 32 MLD

PROCESS : Extended Aeration Process

STATUS : Commissioned in March 2009

- To design a project to collect and treat 100% sewage generated in the City of Pune



POLLUTED RIVER STRECHES (NRCD GUIDELINES)

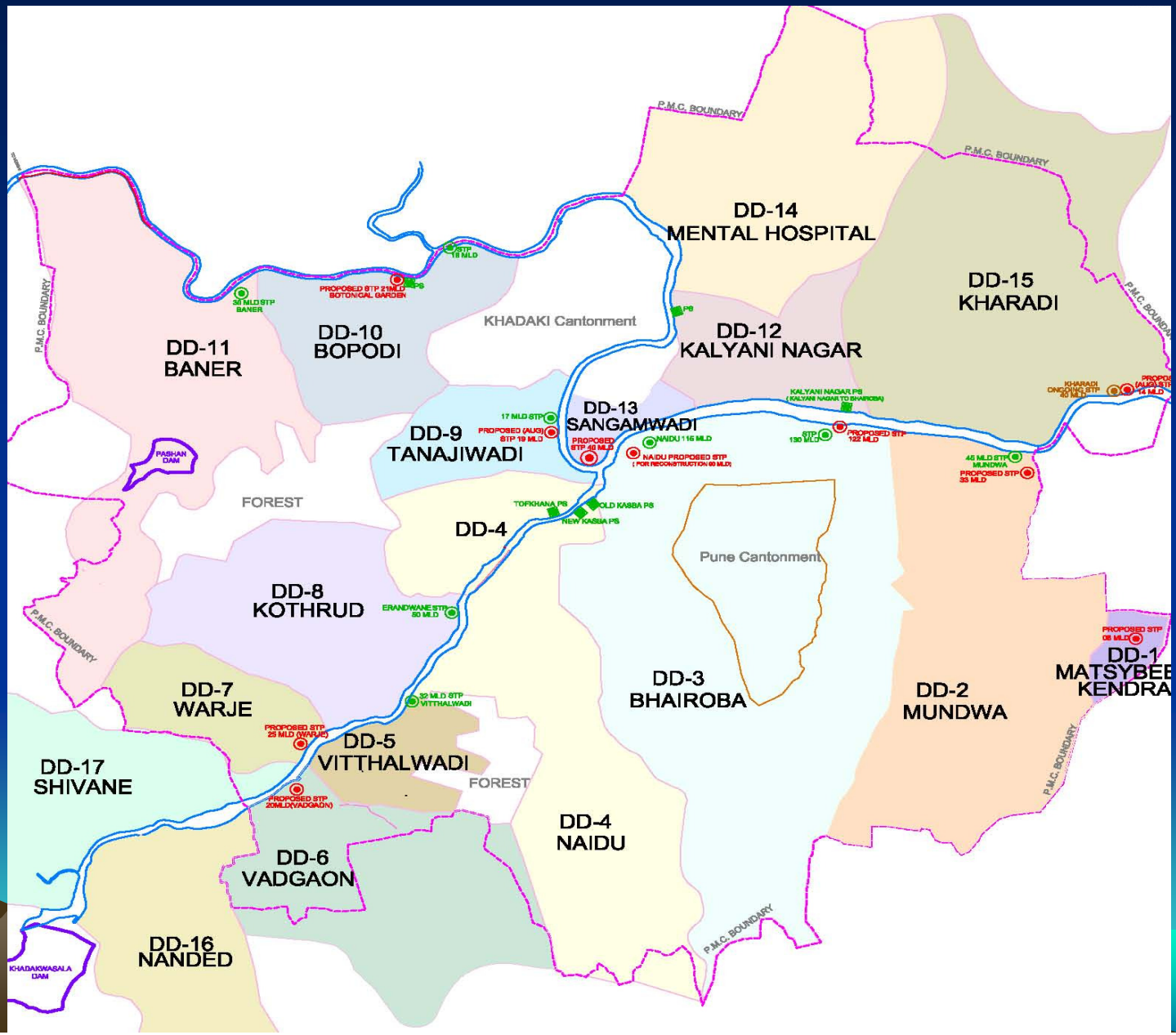
The list of polluted stretches published by CPCB includes the MULA and MUTHA river stretch

POLLUTED RIVER STRETCHES (BOD>30mg/l and BOD exceeding 6mg/l on all occasions)				
River	Polluted Stretch	Source/City	Monitoring Location	BOD (mg/l)
21. Mula & Mutha	• D/s Pune city	City Sewage of Pune	1. Mula-Mutha River at Mundhawa Bridge	36
			2. Mula at Aunth Bridge	
			3. Mula –Harrison Bridge	50
			4. Mutha at sangam Bridge	32

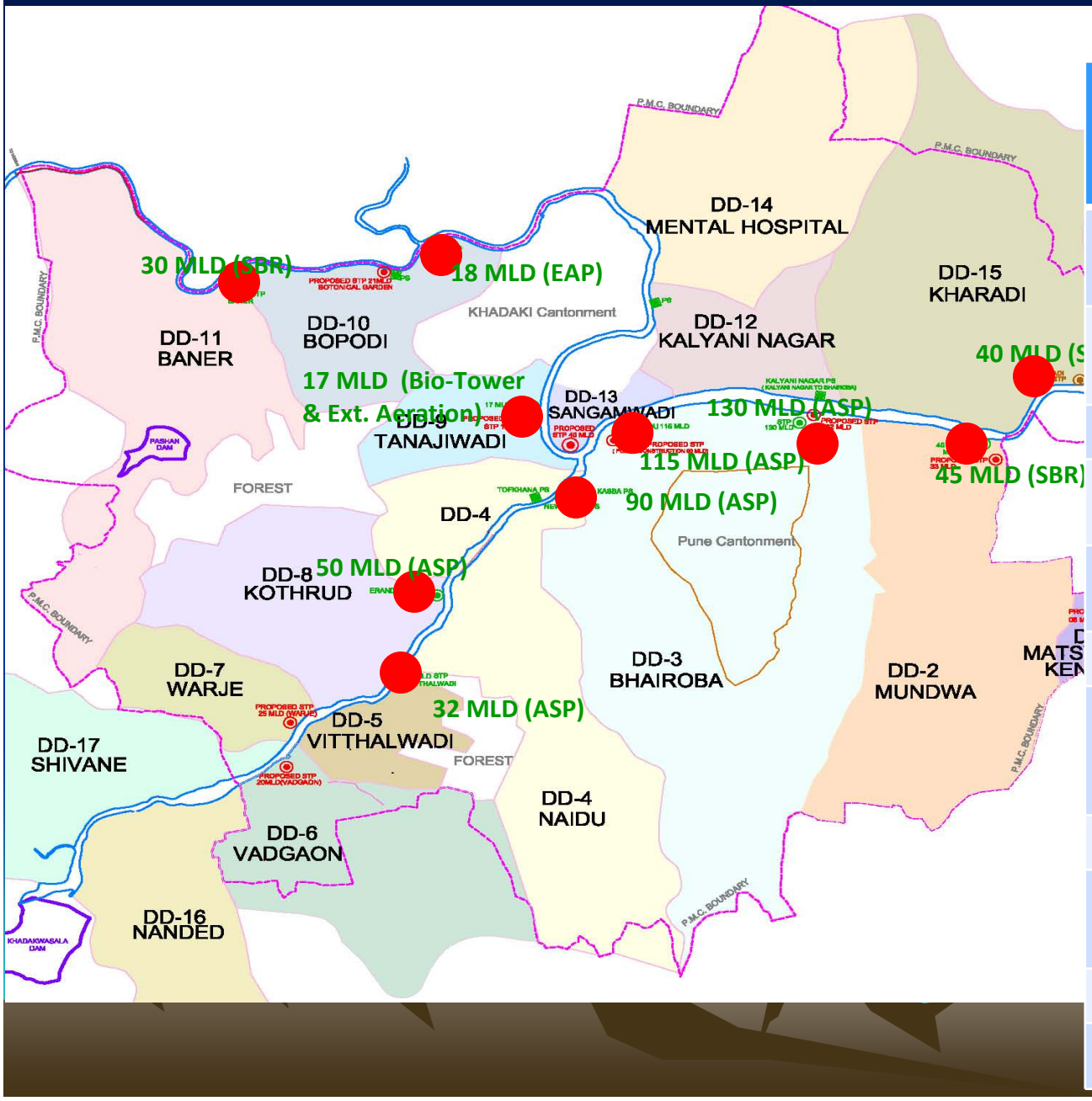
Key problems for ensuring 100% collection and treatment of sewage

- High rate of water supply – resulting in higher sewage flows
- Inadequate / old conveyance or transmission lines causing sewage to flow in Nallas
- Problems with the collection system (unconnected areas, leaking main lines etc)
- Isufficient treatment capacity –
- Space availability at the right locations for sewage treatment
- Sewage flows from upstream outskirts of the city

Define sewage districts



EXISTING STP'S



Location of STP	Process	Capcity (MLD)
Vithalwadi	ASP	32
Naidu	ASP	90
Naidu	ASP	115
Bhairoba	ASP+Ar. Dig.	130
Mundhawa	SBR	45
Kharadi	SBR	40
Tanajiwadi	Bio-Tower+EAP	17
Bopodi	EAP	18
Baner	SBR	30
Kothrud	ASP	50
Total		**567**

PROPOSED STP'S IN DPR (YEAR 2024)

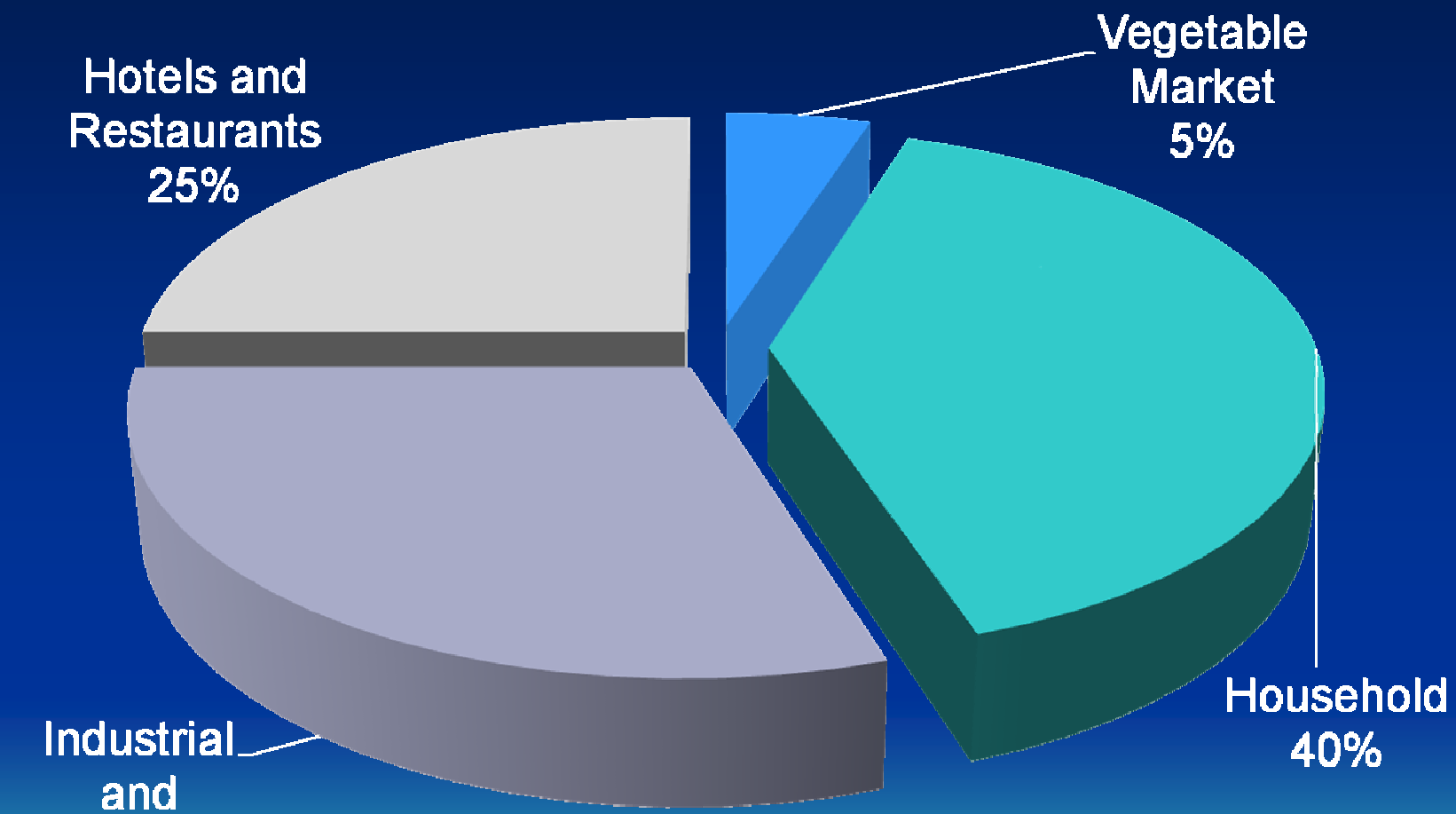
Sewage District	Existing STP		Proposed STP's		Total
	Process	Capacity in MLD	Process		Total
SD1- Matsy Bij Kendra	00	00	MBR	08	08
SD2- Mundhawa	SBR	45	SBR	45	90
SD3- Bhairoba	ASP+Ar. Dig.	130	SBR+Power	70	200
SD4- Naidu	ASP	90 (To be dismantled)	SBR+Power	125	125
SD4- Naidu	ASP	115	00	00	115
SD5- Vithalwadi	ASP	32	00	00	32
SD6- Vadgaon	00	00	ASP+Power	20	20
SD7- Warje	00	00	EA	25	25
SD8- Kothrud	ASP	50	00	00	50
SD9- Tanajiwadi	Bio-Tower+EAP	17	EA	19	36
SD10- Bopodi	EAP	18	SBR	21	39
SD11- Baner	SBR	30	00	00	30
SD14 – Mental Hospital	00	00	ASP+Power	36	36
SD15- Kharadi	SBR	40	SBR	14	54
Total		**567**		**383**	**860**

Municipal Solid Waste

Generation & Segregation in Pune

Total Generation of Waste – 1300 to 1400 MT/Day

Generation – by Source



MSW- A Transformation

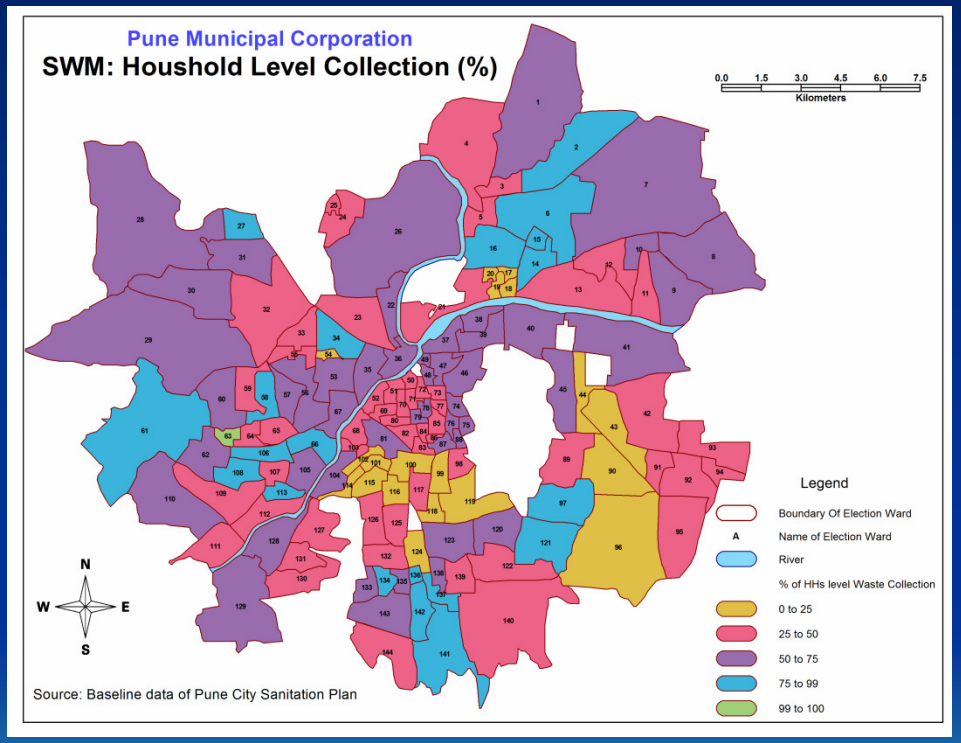
Process	Before 1991	Post 1991	Since 2010
Segregation	X	X	
Collection			
Transportation	 	 	    
Processing	X		 
Disposal			
	Open dumping at Kothrud Depot	Open dumping at Urali Devachi Depot	Scientific Landfill Site

MSW Facts

- Total Waste Generated- 1300 -1400 MTD
- Per capita waste generation@ 450 - 550 gms per capita per day
- Ward wise average- 300 to 700 gms per capita per day
- 1.7 TPD bio-medical waste collected and disposed off scientific.
- 75 to 100 TPD C & D waste collected & disposed through private agency.

Solid Waste Management

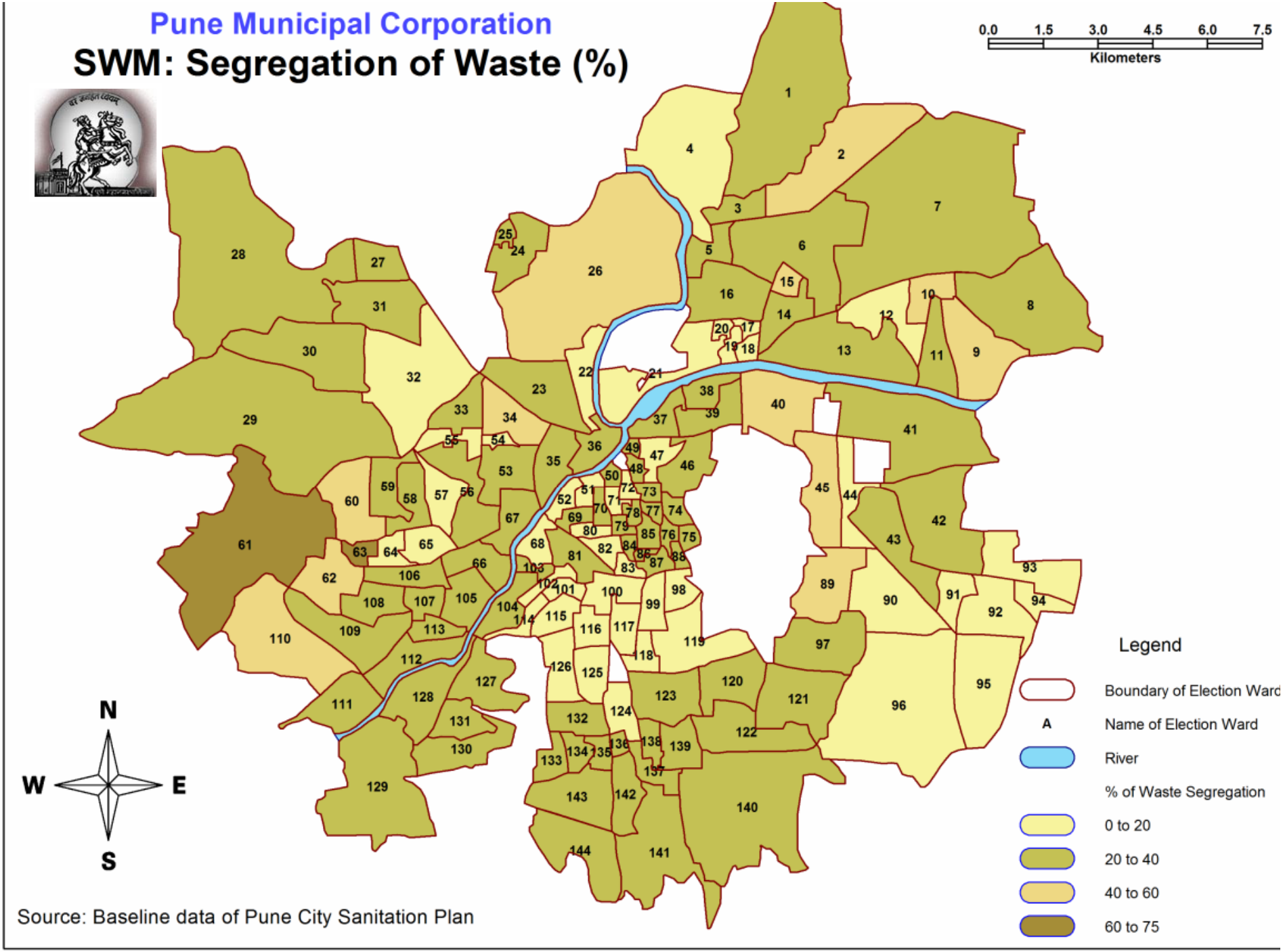
Door to door Collection of Solid Waste



- 90 Ghanta trucks collects about 1,50,000 Kg of wet waste every day
- 23 separate trucks collects about 124370 Kg waste from hotel industries
- About half of all households use community waste bins

Pune Municipal Corporation

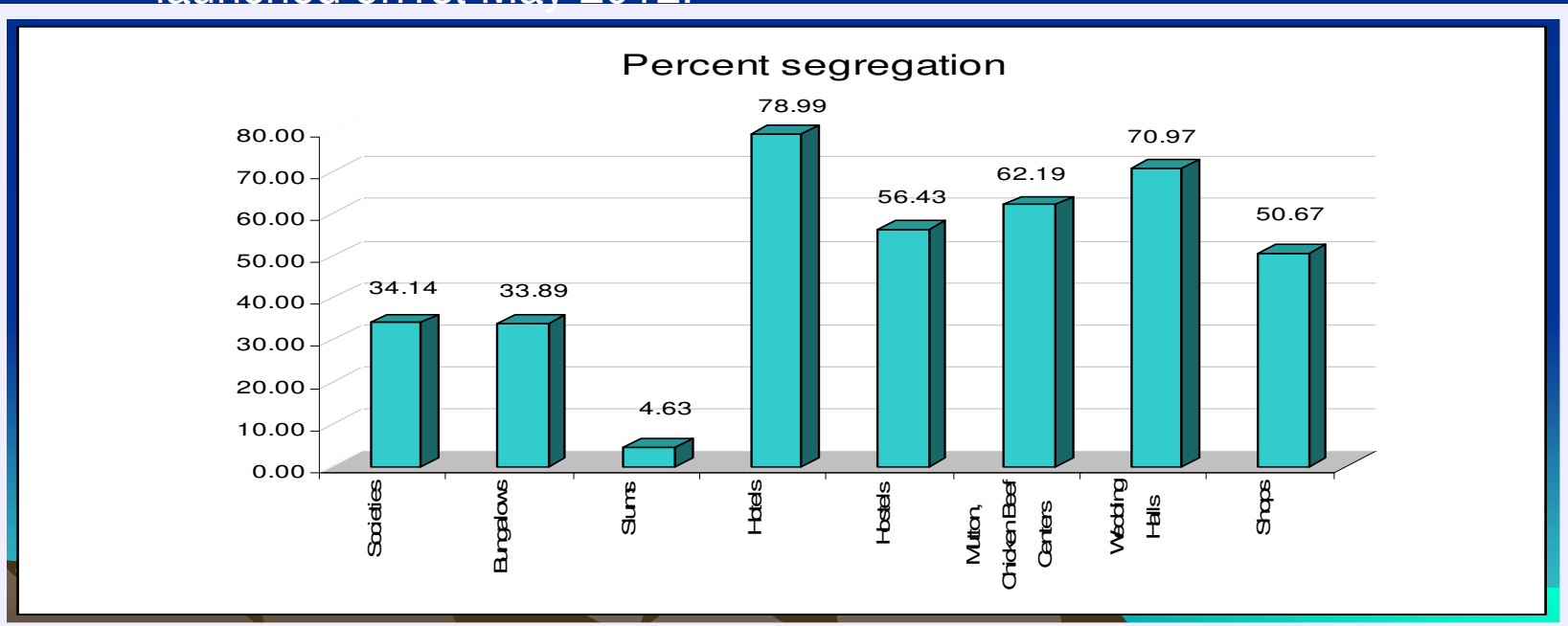
SWM: Segregation of Waste (%)



Source: Baseline data of Pune City Sanitation Plan

Segregation- Approach & Facts

- PPP- with help of NGOs and Rag picker's Organization (like SWaCH).
- Awareness- Through IEC (pamphlets distribution & society level meetings)
- Incentives- Distribution of dry and wet waste collection bins to households.
- **Loknete Yashawantrao Chavan** Shahar Swachata Abhiyan launched on1st May 2012.



Performance based on SLBs

S	Performance Indicator	Expected	2012
1	Household level coverage of solid waste management services	100	52.70
2	Efficiency of collection of municipal solid waste	100	100
3	Extent of segregation of municipal solid waste	100	27.96
4	Extent of municipal solid waste recovered	80	85
5	Extent of scientific disposal of municipal solid waste	100	100
6	Extent of cost recovery in solid waste management services	100	60.88
7	Efficiency in collection of solid waste management charges	90	67
8	Efficiency in redressal of customer complaints	80	84.74

Legal Compliances

- BPMC Act 1949 section 63, 290 to 294, schedule chapter 14 & other relevant sections
- Government of India Municipal Solid Waste (Management and Handling) Rules 2000
- Maharashtra Non-biodegradable Garbage Control Act, 2006
- Maharashtra Government Resolution no. Gha. Ka. Vya.1001/ Pra. Kra 546/ Papu-22 dated 5 January 2002 to municipalities concerning waste-pickers and allotting them the works of picking wastes and garbage from houses, shops and market places
- The Bio Medical Waste Management and handling Rules 1998/2000/2003 amended
- The Hazardous Waste Management and Handling Rules 2000/2003 amended
- The Guidelines/Rules in making waste from EEE

Key Focus Areas

- Awareness
- Container free city
- Alert System
- Promotion of Decentralized Waste Processing facility
- Practice of Four ‘R’

  Reject, Reduce, Reuse, Recycle
- Comprehensive solution for Centralized Waste Processing

Services Provided

- Primary and secondary collection of waste
- Segregation and storage and waste reduction at source
- Transportation
- Processing and disposal
- Estimate and analysis of waste
- Waste minimization
- Public awareness and enforcement
- Resource management
- Prohibition of littering

PPP Approach

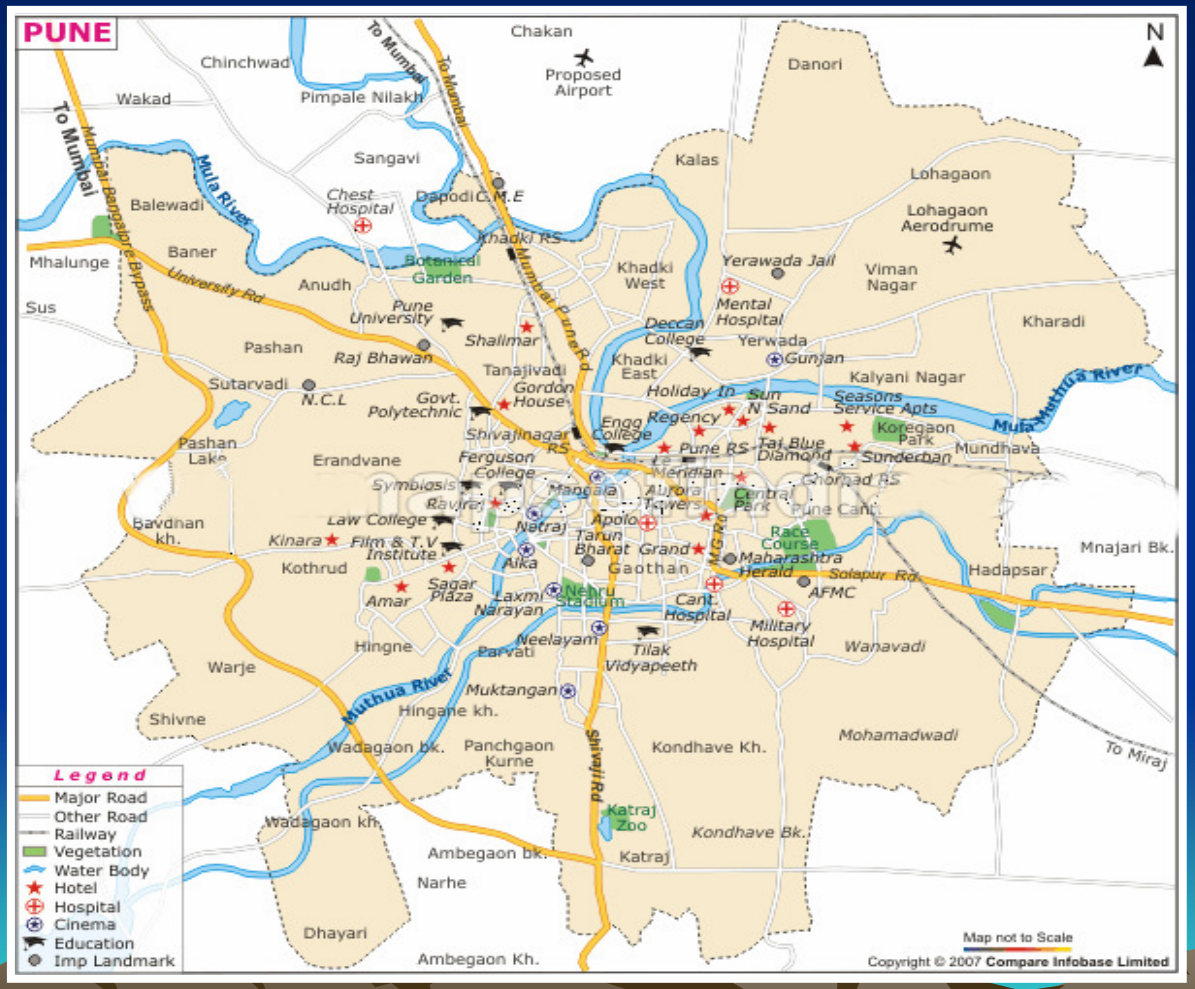
- A decentralized, sustainable, energy efficient, labor friendly and low cost model
- Services provided
  - Door to door collection
  - Segregation of source
  - Recovery of recyclables
  - Transport of residue to close containers
- User fee charged

PPP Approach

Tax rebate given by PMC for eco-friendly measures practiced by citizen.

DETAILS	No. of Properties
Solar	1971
Vermiculture	4534
Solar & Vermiculture	4807
Vermiculture & Rain Harvesting	538
TOTAL	11850

Coverage



Household Coverage with user fee recovery
= 3,20,584 households

No. of Waste Collectors
= 1,986

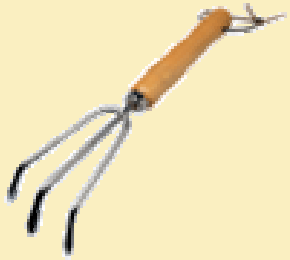
Supervisors
= 80

Coordinators
= 11

Cycle rickshaws
= 689

Buckets
= 5958

PMC pays for Equipment and Management Costs




SWACH
A higher level of self- relian
door-step collection service to the citi


Clothes
Metal
Glass

Composting-Bio gas-- Society level, household level, ward level

Amount composted each month: 450 Tons
Additional Composting Unit at Aundh Ward Operated by SWaCH: 3 Tons
Currently specialize in: Mechanical Composting (OWC, Shredder), vermi composting and bio composting

New Portable Sheds for SWaCH

SUNDAY TIMES OF INDIA, PUNE
MARCH 13, 2011

Now, waste-pickers get portable work space

TIMES NEWS NETWORK

Pune: In a bid to make Pune a healthy city, and to reduce visual discomfort caused to citizens due to waste-pickers sorting waste on roadsides, the Swach cooperative has introduced portable recycling centres and sheds in some parts of the city. These areas will be used by waste-pickers to sort dry-waste.

While only four such centres have been started so far, the aim is to have one each in every neighbourhood.

Laxmi Narayan of Swach said the four centres have been started by raising donations and the Swach is now planning to reach out to the corporate sector for help.

"Ideally, the state should invest in setting up sorting centres, so that the waste-pickers have a proper space to do their job. The aim is to shield the waste-pickers, as people often complain about women sorting waste on roadsides or outside housing societies. This is because, waste-pickers do not have any designated space to carry out their work," Narayan said.

Narayan explained that these sheds will also be a way to recycle scrap material. "Flex-boards that we see across the city are the biggest concerns these days as they cannot be recycled and are seen lying around. We plan to use these boards as screens for the sheds. Eventually, these areas will be used for recycling garbage, or sale of scrap material," she said.

The Swach cooperative, established by Kagad Kach Patra Kashtakari Panchayat, is an autonomous enterprise of waste-pickers that is authorised to provide door-to-door waste collection and waste management services by the Pune Municipal Corporation.

Mandar Deshpande

A sorting centre at Bhosalenagar

The idea of opening centres is to shield the waste-pickers, as people often complain about women sorting waste on roadsides or outside housing societies. They are forced to sit on the road as they don't have any designated space to work

- **There are 25 sorting shed Including 6 Portable & Other**
- **Sonia Gram Udyog Prakalp**
  1) Aundh 2) Katraj
- 200 – 250 Waste Picker Directly Attached Processer
- 4 TPD of waste is Processed

Making Ganesh Visarjan eco-friendly

PMC &Swach worked with Ecoexist to ensure flower waste produced during the Ganeshotsav was used to create natural colours for Holi rather than polluting the rivers

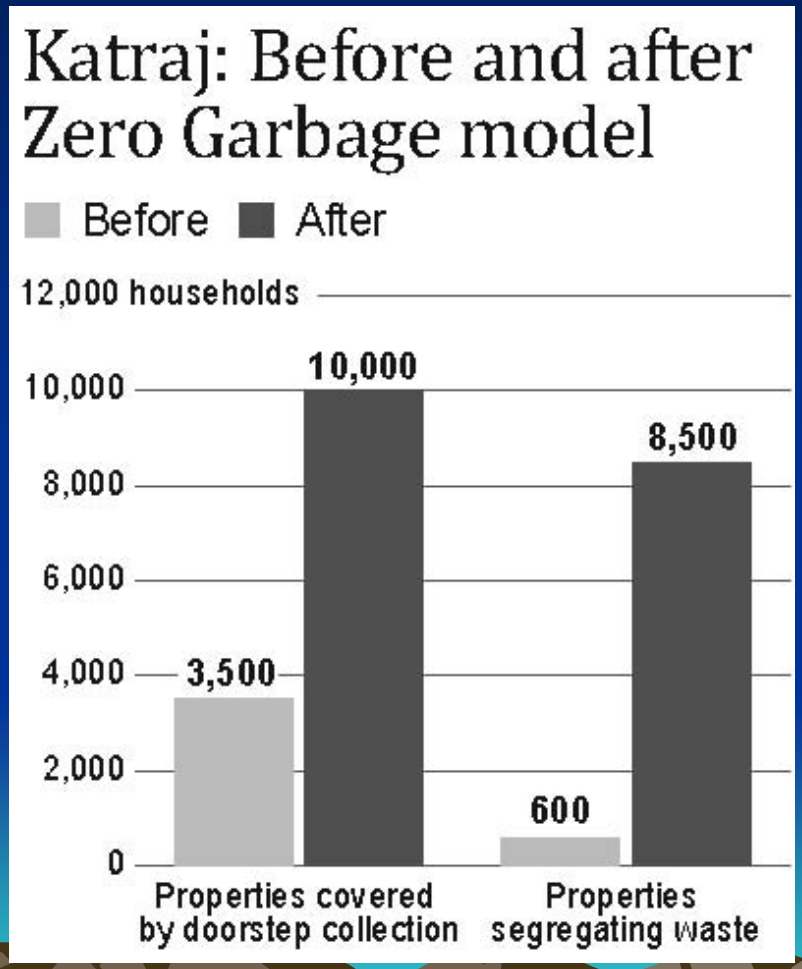
SECOND YEAR IN A ROW PMC worked with the SWaCH and Ecoexist to ensure that dry and wet waste generated near riversides during Visarjan time got appropriately disposed. PMC also ensured that Ganesh idols were only immersed in special water tanks built at various ghats for immersion and not in rivers.

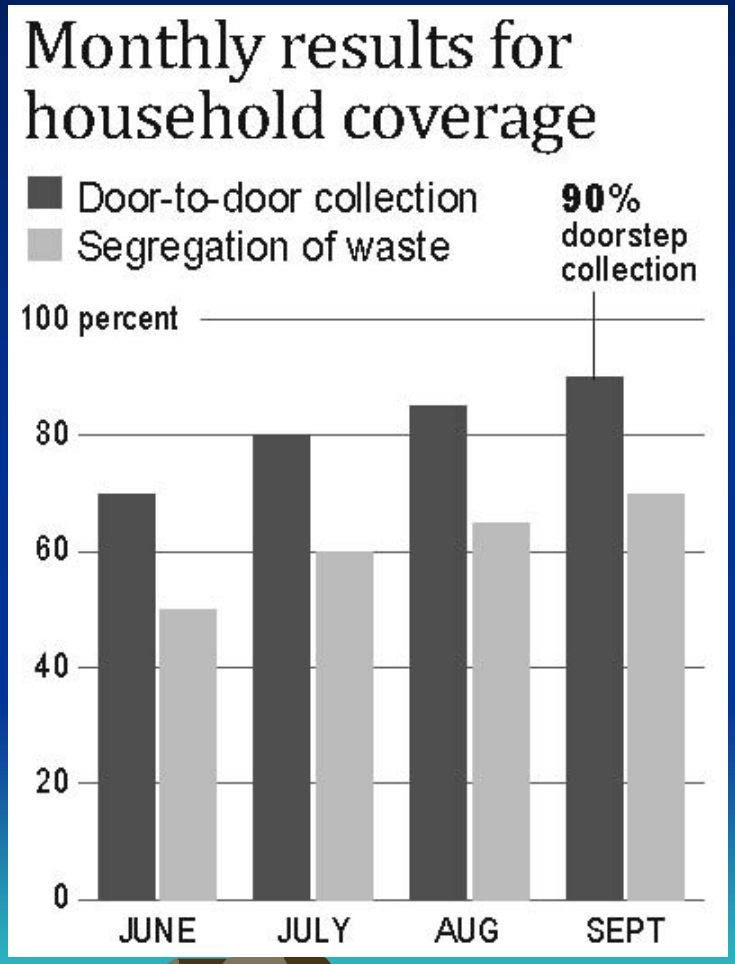
Waste Collectors learning how to make natural colours from Visarjan flowers

Results in Katraj

- Main outcome: *80% reduction* in waste sent to landfill by ward. Reduced from 10 tons per day to less than 2 tons per day.
- Dramatic increases in door-to-door collection and segregation, meeting legal demands from 2000 laws.
- Quality of life improvements for residents *and* area waste pickers.

Katraj at a glance



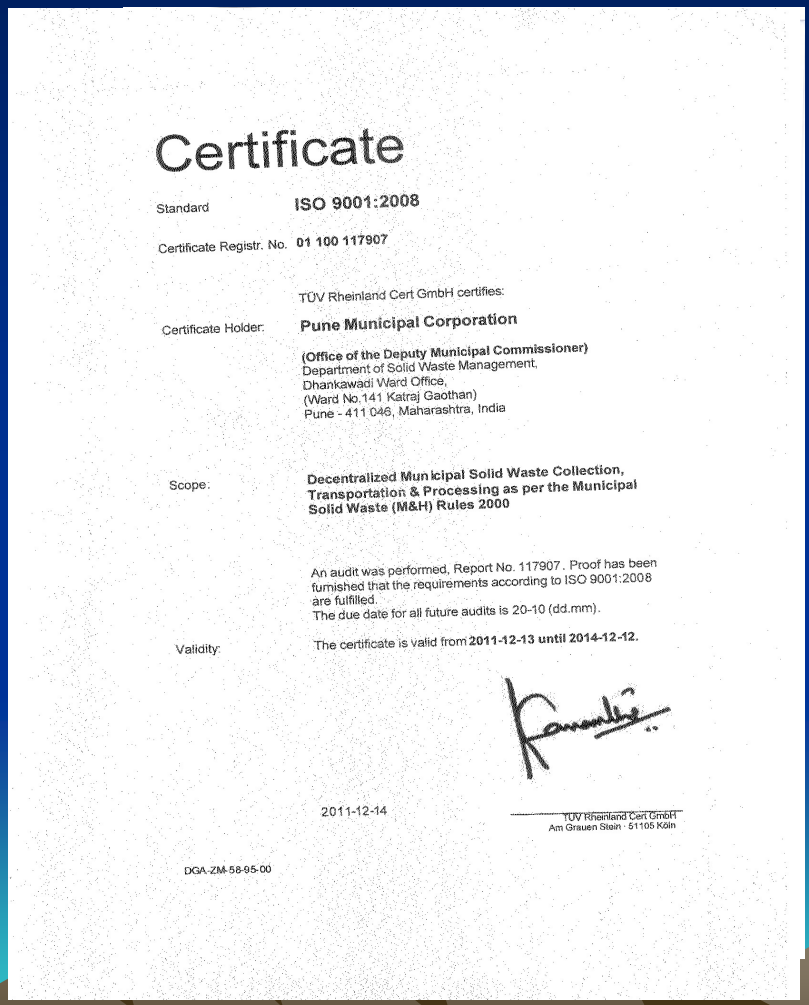


Results in Katraj

- First waste management system in India to receive ISO certification.

- Manual developed for ISO establishes correct practices for waste collection, transportation and disposal.
- Manual outlines process for complaints by both residents and waste pickers.
- Certification process paid by Cummins India.

ISO Certificate for Green Initiative



Certificate

Standard: **ISO 9001:2008**

Certificate Registr. No.: **01 100 117907**

TÜV Rheinland Cert GmbH certifies:

Certificate Holder: **Pune Municipal Corporation**

(Office of the Deputy Municipal Commissioner)
Department of Solid Waste Management,
Dhankawadi Ward Office,
(Ward No.141 Katraj Gaothan)
Pune - 411 046, Maharashtra, India

Scope: **Decentralized Municipal Solid Waste Collection, Transportation & Processing as per the Municipal Solid Waste (M&H) Rules 2000**

An audit was performed, Report No. 117907. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 20-10 (dd.mm).

Validity: The certificate is valid from **2011-12-13 until 2014-12-12.**

2011-12-14

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DGA-ZM-58-95-00

CERTIFICATE

TÜV AUSTRIA

Management system as per EN ISO 9001:2008

In accordance with TÜV AUSTRIA CERT procedures, it is hereby certified that

Pune Municipal Corporation's Biomethenation- cum- Power Generation Plant (Ward No. 34)
Ward No.34, Canal Road, Model Colony, Pune - 411 016, India

applies a management system in line with the above standard for the following scope

to convert organic municipal solid waste to electricity through biomethenation process

Certificate Registration No. 20 100 112005996 Valid until 2014-04-03

Certification Body
at TÜV AUSTRIA CERT GMBH

Vienna, 2011-04-04

This certification was conducted in accordance with TÜV AUSTRIA CERT auditing and certification procedures and is subject to regular surveillance audits.
TÜV AUSTRIA CERT GMBH Krugerstraße 16 A-1015 Wien www.tuv.at

SARVAJANIK GANESH UTSAV

Collection- Vehicles & Volume

Tipper Trucks	• 90 Nos • 1,50,000 kg per day
Hotel Trucks	• 23 Nos • 124370 kg per day
Door to door	• 1986 rag-pickers for door to door collection • 3,20,584 properties covered
Containers /Compacter Buckets	• 936 containers and 412 dumper buckets

Transportation

Vehicle Name	Nos.
Tipper Trucks	90
Compactors	17
Hotel Trucks	23
Tractors	5
Dumper Placers	68
Bulk Refuse Carrier (B.R.C.)	50

Processing

- No open dumping since June 2010
- 100 percent scientific processing of waste generated
- Decentralized Waste Processing Plant

Processing Plants

Hanjer Biotech 1 & 2	• 1000 TPD • Composting, RDF, Pallets and Bio-fuel • Location- Urali and Fursrungi
Ajinkya Biofert	• 200 TPD • Vermi- compost and compost • Hadapsar Ramp
Disha Waste Management	• 100 TPD • Vermi- compost and compost • Ram Tekdi Industrial Estate
Biogas and Mechanical Compost	• 60 TPD • Electricity and Compost • 14 Decentralized Plants
Rochem Separation Systems	• 700 TPD • Electricity • Ram Tekdi, Hadapsar

Hanjer Biotech

Ajinkya Biofert

Disha Waste Management

Biogas and Mechanical Compost

मॉडेल कॉलनी बायो गॅस प्रकल्प (क्षमता. ५. मे. टन प्रतिदिन)


बावधन बायो गॅस प्रकल्प (क्षमता. ५. मे. टन प्रतिदिन)


पेशवे पार्क बायो गॅस प्रकल्प (क्षमता. ५. मे. टन प्रतिदिन)

काञ्रज २ बायो गॅस प्रकल्प (क्षमता. ५. मे. टन प्रतिदिन)

Rochem Separation System

Bio Methanation Plants

- Electoral Ward wise decentralized treatment plants
- Technology: Bio Methanization
- Requirement: Wet wastes
- Output: Electricity and manure
- Benefits
  - Disposal of waste at local level
  - Reduction in transportation cost @ Rs. 650 per ton of waste, approximately Rs.10.72 lakhs annually
  - Valuable bi- products such as manure and biogas
  - Space requirement of 600 sq ft for 5 TPD plant
  - Reduced green house gas emissions and environment friendly operations

Processing- Biomethanation Plants

Sr. No	Location of Biomethanation Plants	Capacity of Plant
1	Aundh Ramp	5 TPD
2	Maharashtra Board Yerwada	5 TPD
3	Sangamwadi	5 TPD
4	Peshwe Park	5 TPD
5	Ram Tekdi	5 TPD
6	Katraj Ramp	5 TPD
7	Karvenagar	5 TPD
8	Aagakhan palace amenity place	5 TPD
9	Karve Road ward office	5 TPD
10	Hadapsar Ramp	5 TPD
11	Uppar Indira Nagar	5 TPD
12	Ghole Road Ramp	3 TPD

Energy Generation Details

Description	Value
Biogas Generation	300+5% m3/day
Calorific Value	4800-5000 Kcal/cum
Engine Efficiency	25%
Overall efficiency	85%
Electricity Generation	1.5 kWh/cum of Biogas
Equivalent Electricity Generation	450kWh/day
Auxiliary Power requirement	@50 kWh/day
Net Surplus Electricity for sale	400 kWh/day

Direct Income/Savings for PMC

	Single Plant Capacity	Total 11 Plants Capacity
Plant Capacity	5 TPD	55 TPD
Income from Savings in Electricity	Rs. 6.57 Lacs	Rs. 72.27 Lacs / Year
Income from sale of manure	Rs. 3.30 Lacs/Year	Rs. 36.30 Lacs/Year
Total Income	Rs. 9.87 Lacs/Year	Rs.108.57 Lacs/Year

Indirect Savings for PMC

	Single Plant Capacity	Total 11 Plants Capacity
Plant Capacity	5 TPD	55 TPD
Savings in current Transportation and dumping of waste cost	Rs. 2000 /Day * Rs.7.30 Lacs/Year	Rs.22000 / Day Rs.80.30 Lacs/Year
Environmental Savings	?	?

* Current cost for PMC for transportation of waste @ Rs.550/Ton (-) Transportation charges required for waste dumping to Biogas plant @ Rs.150/Ton = Total savings @ Rs.400/Ton.

Processing- Mechanical Composting

Sr. No	Location of Biogas Plants	Capacity of Plant
1	Ram Tekdi Garden	2 TPD
2	Aundh Ward office	2 TPD

Recycle & Byproducts

- **Recycle**
  - 60 to 80 MTD of dry waste sold by rag pickers
- **Byproducts**
  - Electricity
  - Manure
  - Compost
  - Bio Fuel

Achievements

- No open Dumping
- 100 percent scientific disposal since 2010
- Nagar Ratna Puraskar under JNNURM for city sanitation and cleanliness
- Successful pilot project- *“Nirmal Katraj, Dekhne Katraj” (Zero garbage Ward)*
- In process of acquiring ISO certificate for primary and secondary collection

Solid Waste Management

SWOT Analysis

Strengths	Weakness
• 100% collection and processing Solid Waste • Automated and closed vehicles for transportation • PPP approach in waste collection at source • Scientific disposal of inert waste • Strong public grievance redressal system • Waste to Energy plant, compost plants and bio gas plants to cater to future needs • ISO certification for zero garbage pilot project	• Low segregation at source • Partial door to door collection • Inadequate Staff. • Attitudinal and habitual practice of littering, dumping of waste on streets, open places, etc • Land identification and acquisition for future scientific landfill
Opportunities	**Threats**
• Willingness of CBO's, NGO to contribute to the system. • Awareness generation through IEC • Recycling of waste. • Waste to energy options • Capping of Garbage site • Facility for E Waste processing on BOT/ PPP model • Designing legal framework for compulsory at source segregation and disposal of construction waste	• Load on the SWM collection system and rise in expenditure • Burden on cleaning of streets • Environment and health hazard

Current Initiatives

- MSW Processing plant of capacity 700 TPD
- Technology: Gasification/ Pyrolysis
- Output: Electricity generation@ 10 MW per hour
- BOOT basis
- Space Requirement: 10000 sq mts
- Waste disposal in 48 hours
- Less inert material after treatment

Vision 2020

- Volume reduction at primary collection site
- 100% door to door collection of segregated waste
- Transportation of waste in closed automated vehicles
- Capping of landfill site
- Identification and sanctioning of land for Scientific landfill and garbage processing to cater to future needs
- Reservation of land for garbage processing in future Development Plan

Vision 2020 (Cont.)

- Build and operate higher capacity projects
- Mandatory onsite scientific disposal of solid waste in big townships and schemes
- Separate byelaws for debris
- Develop independent processing facility for e-waste
- Awareness generation for reduce, recycle and reuse
- Carbon Credit

Vision 2020 Cont

Achieving “totally sanitized city”

- Decentralize administrative power.
- Encourage public participation in sanitation. Adopt web-based grievance system to allow public to easily voice concerns.
- Promote employment opportunities in recyclable sales.
- Monitor progress at regular intervals using technology
- Work with State and Central Governments to overcome bureaucratic hurdles.
- Provide incentives for recycling.

Scientific Closure of MSW Dump

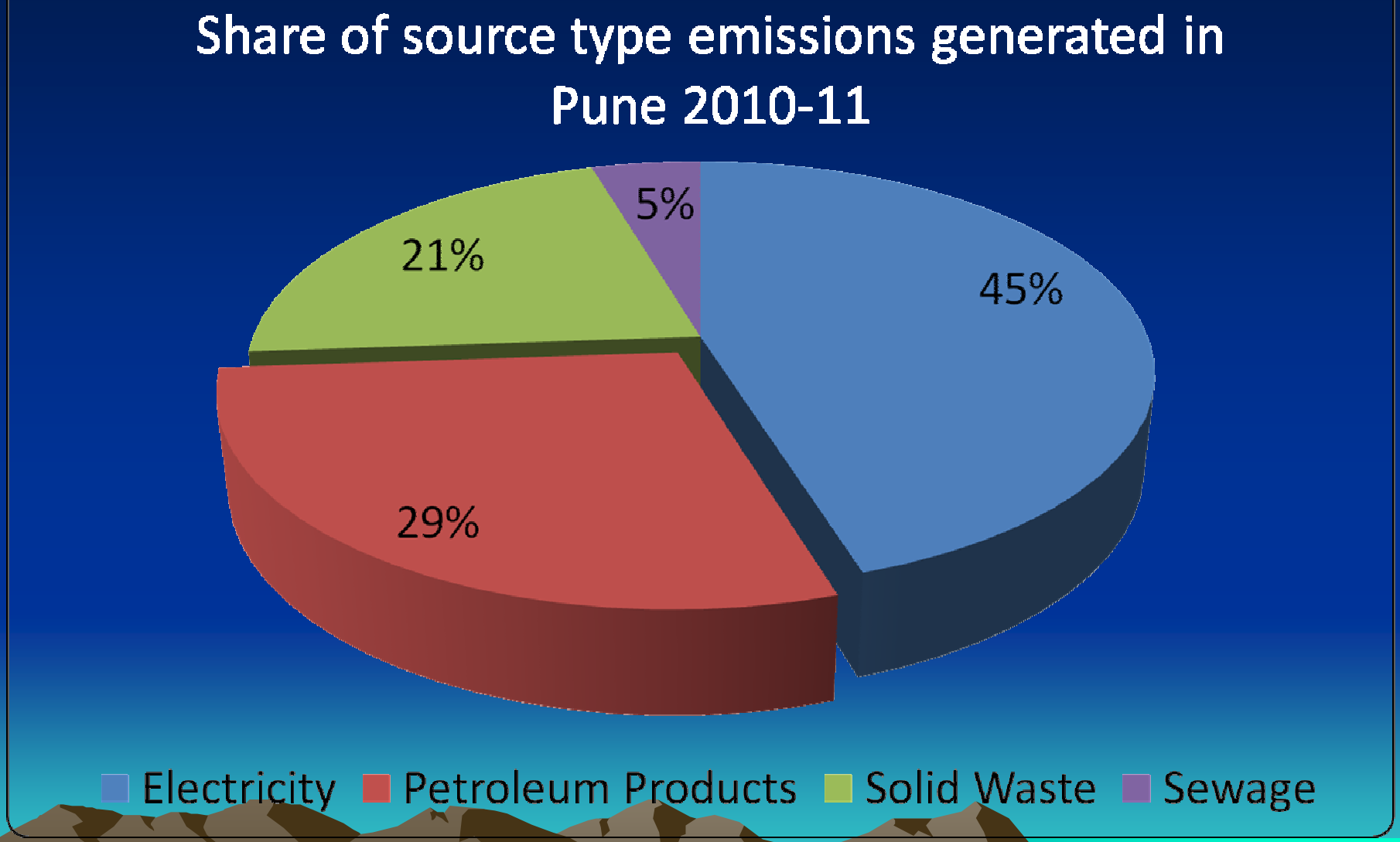
As per MSW Rules 2000, Scientific closure and beautification of 30 hectares of dumping site at Urali Devachi is in progress

Uruli Garbage Depot Capping

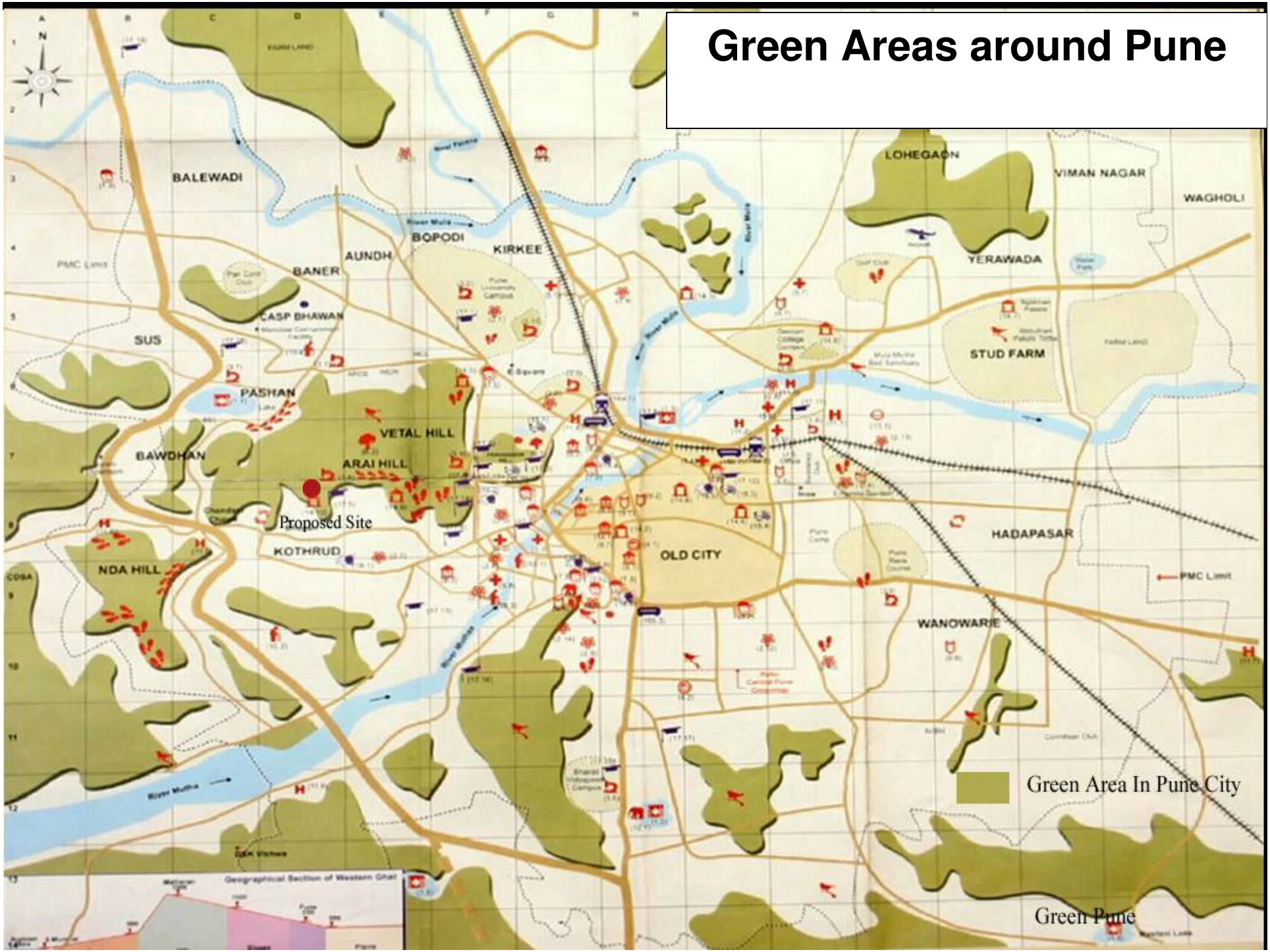
Ongoing Capping Work
Uruli Garbage Depot

Land Fill Site – Uruli

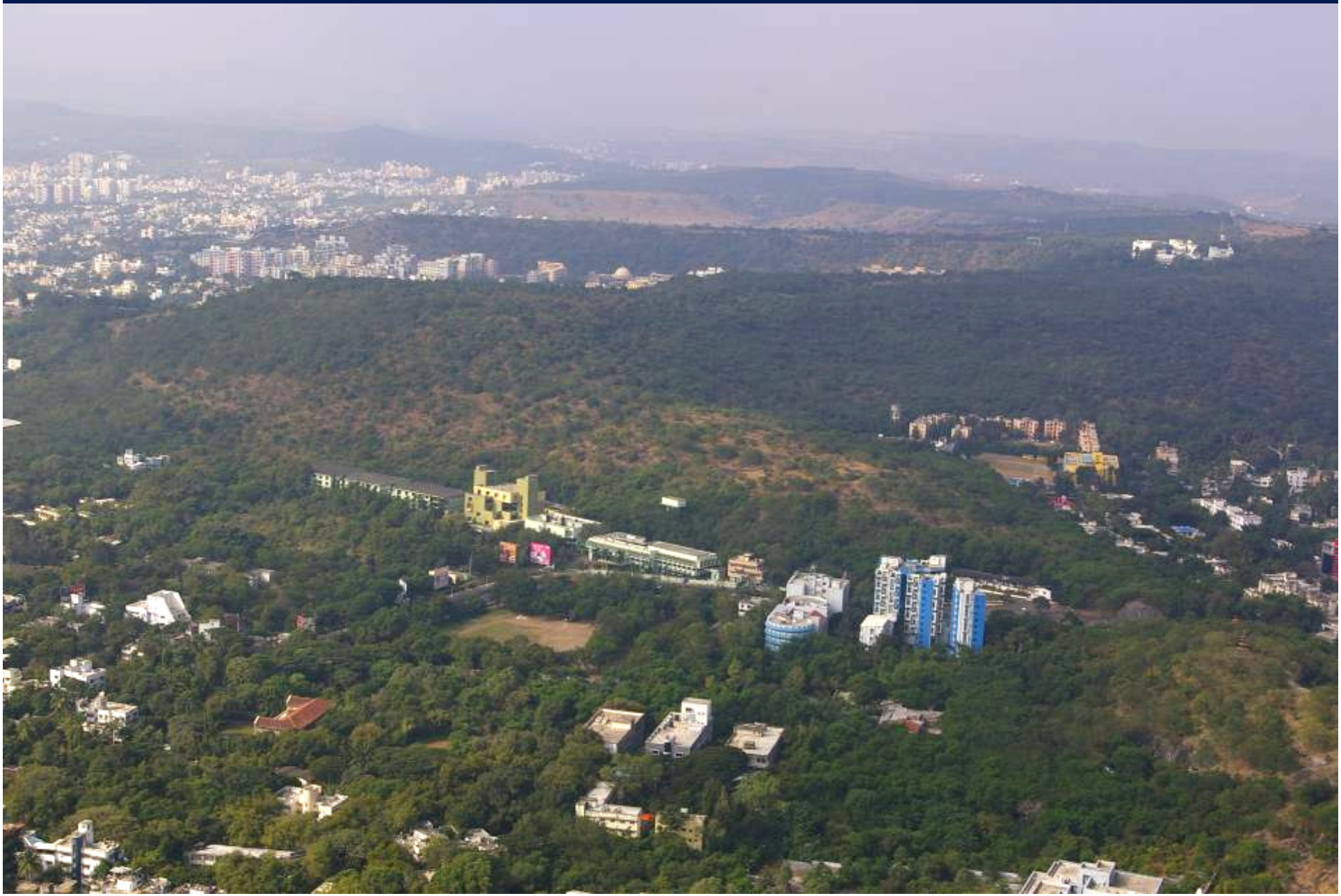
Overall GHG emissions in Pune



Green Areas around Pune



Joint Forest Management near Balbharti

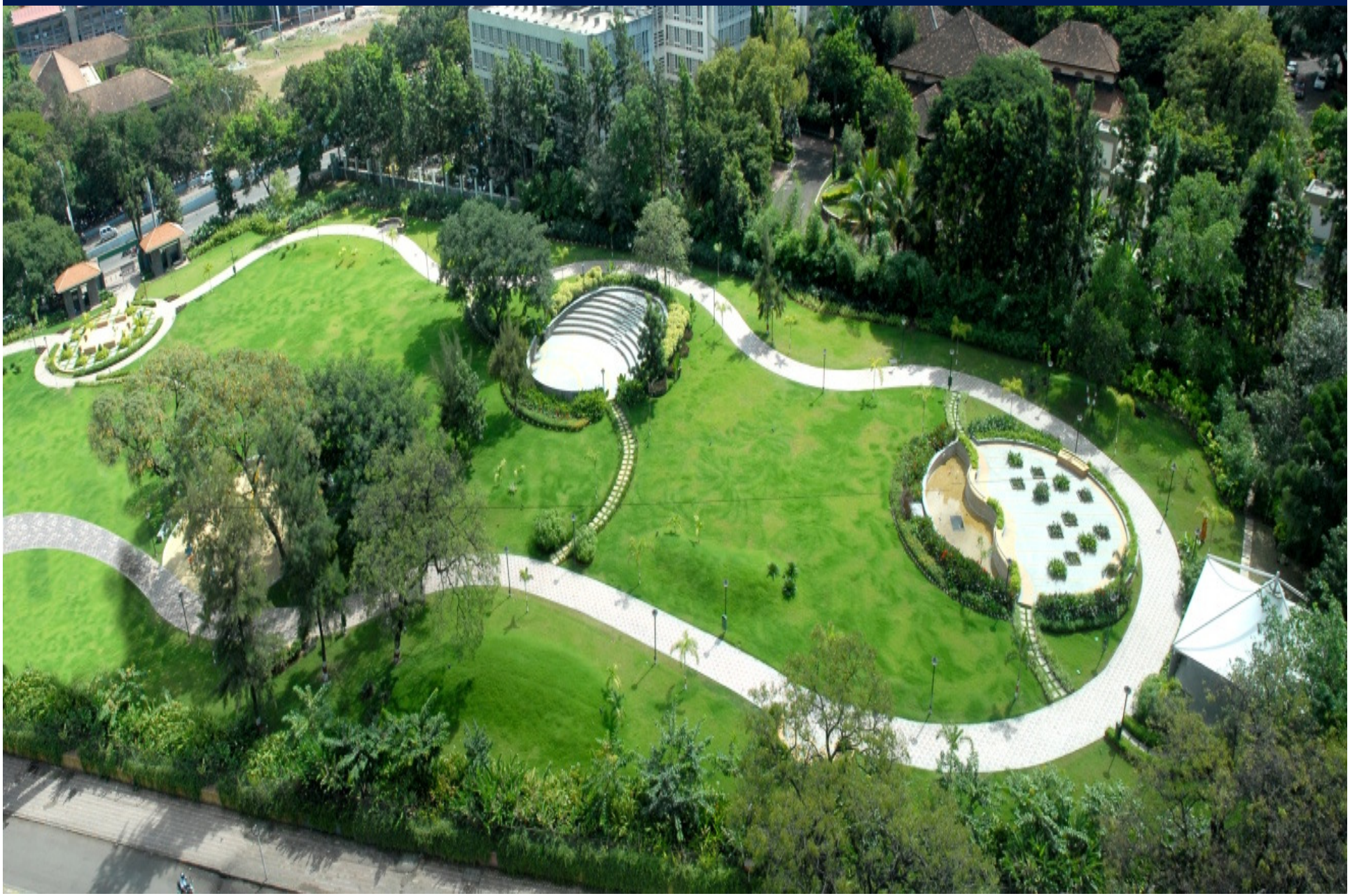


Joint Forest Management at Pachgaon Parvati

Rajiv Gandhi Zoo, Katraj

Plantation in Mohammadwadi area

Gardens development in Pune city



Gardens development in Pune city

Gardens development in Pune city

Gardens development in Pune city

KATRAJ LAKE RESTORATION AND BEAUTIFICATION PLAN

KATRAJ LAKE 2005

KATRAJ LAKE 2008

TOTAL AREA = 14 ACRES

ISLAND CREATED = 1 ACRE

Actual site photograph of Katraj Lake

PASHAN LAKE RESTORATION & BEAUTIFICATION PLAN

PASHAN LAKE 2005

TOTAL AREA = 142 ACRES

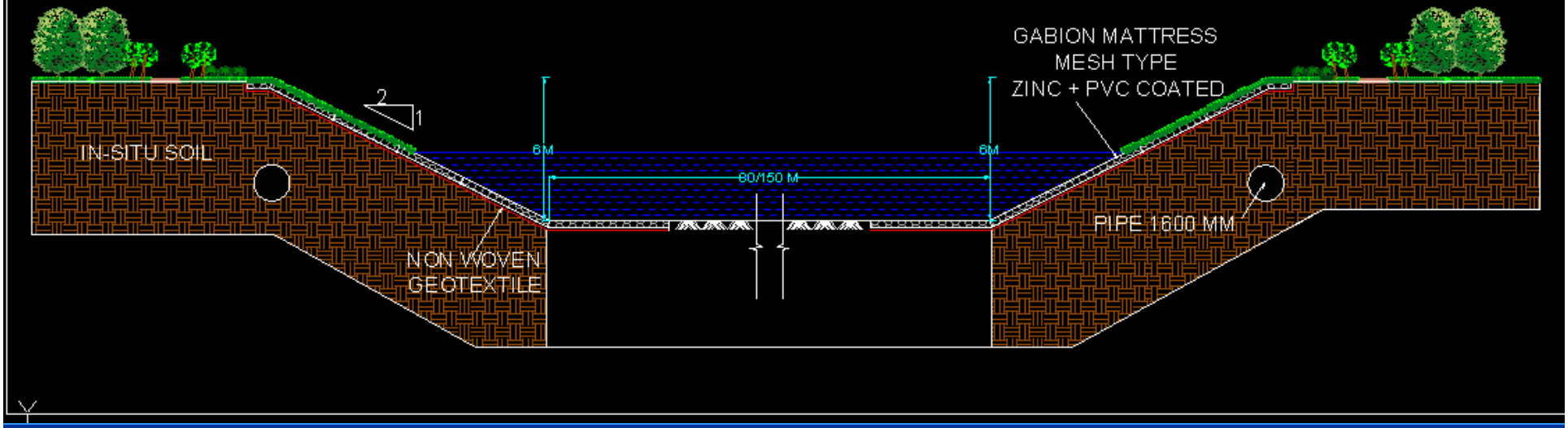
ISLAND CREATED = 14 ACRES

Plantation at Pashan Lake under JNNURM

MULA-MUTHA RESTORATION & BEAUTIFICATION PLAN

A view of the river near Onkareshwar Temple

CROSS SECTION

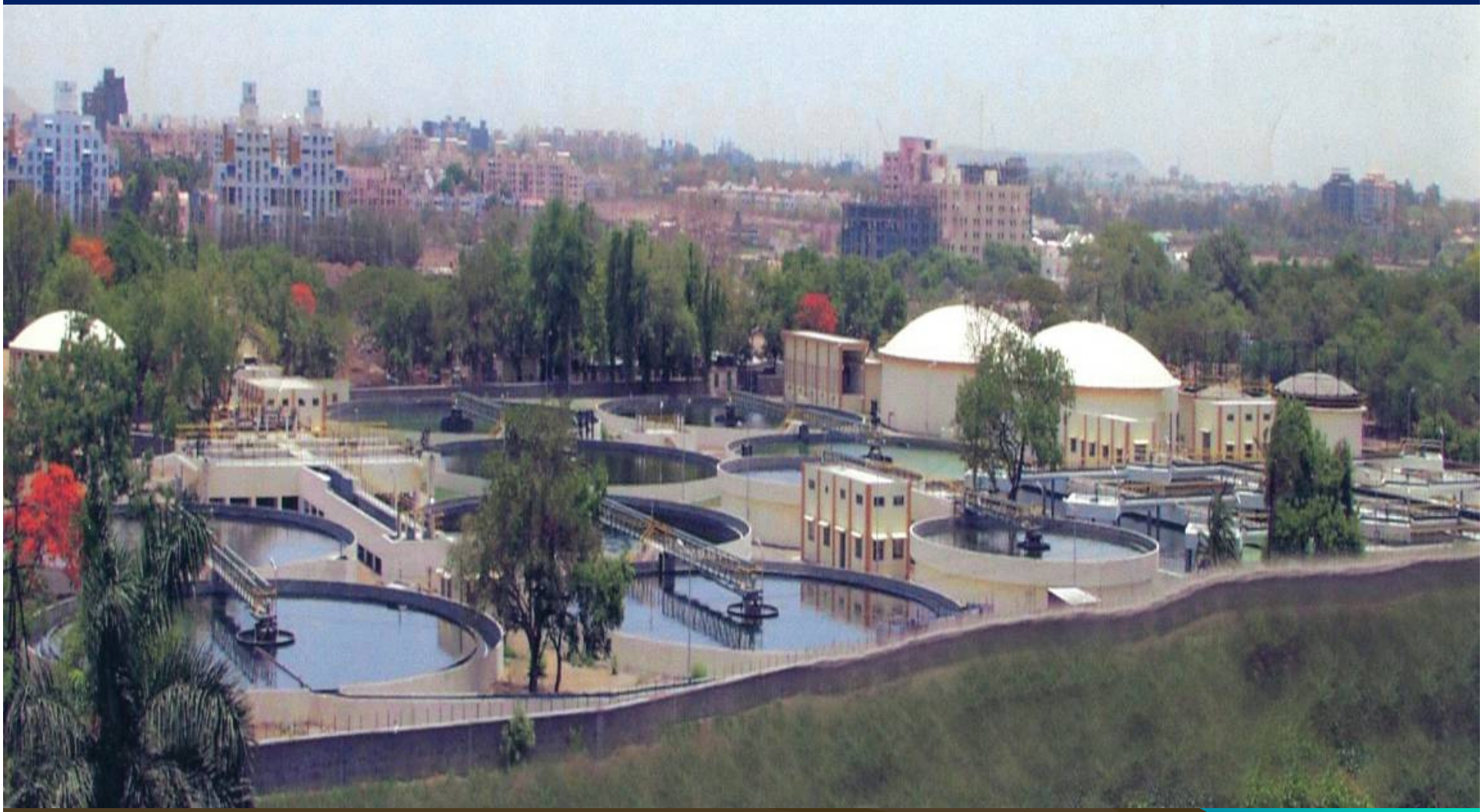


Newly laid Reno Mattresses

Growth of shrubs on Reno Mattresses

Sewage Treatment Plant at Bopodi

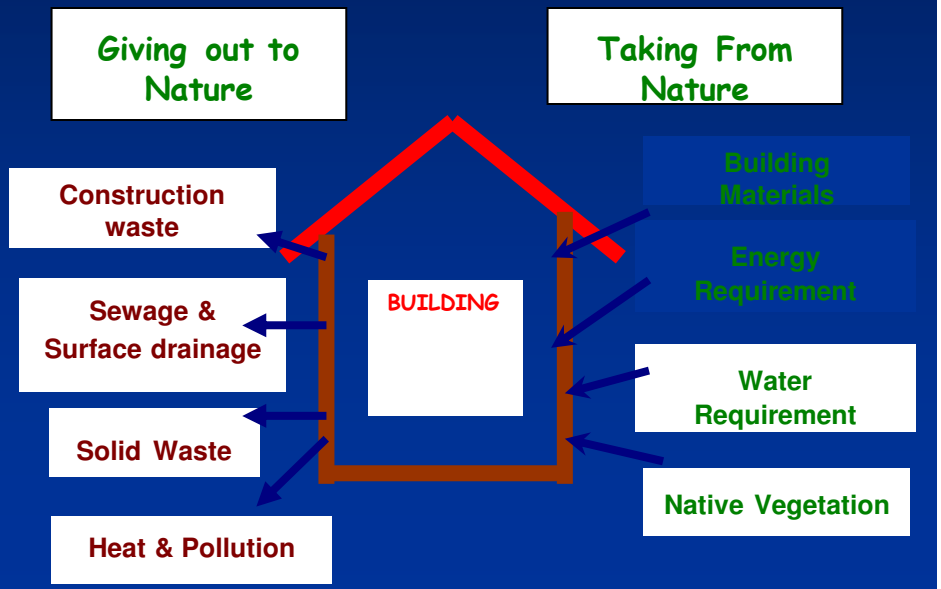
Bhairoba STP plant



Eco Housing – Construction of Green Buildings

PMC has developed incentive based following criteria for developing Green Buildings.

Focus areas	*Points*
Site planning	260
Environment Architecture	80
Efficient Building Materials	200
Energy efficient lighting	50
Solar water heater	50
Water conservation	200
Segregation of waste	80
Other innovative technologies	80
Total Number of Points	1000

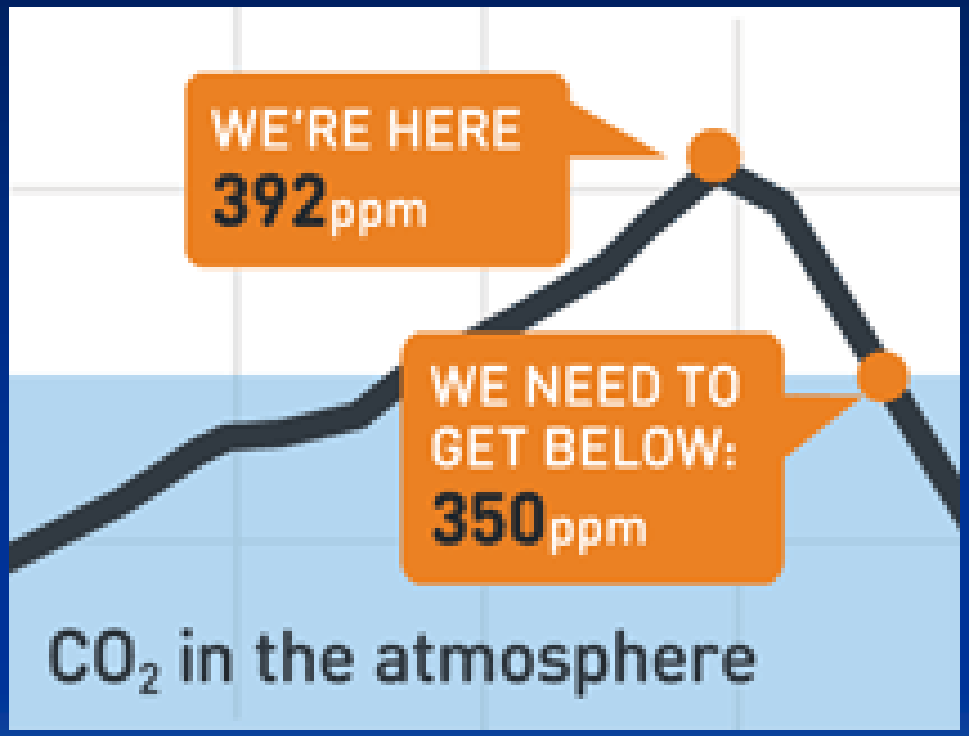


Use of Solar and Wind energy in new buildings in Pune

Environment Awareness Activity at Indradhanushya for Children

Pune Tree Festival 2012
6th to 9th Jan 2012

CLIMATE ACTION AWARENESS BY CITIZEN GROUPS



www.350.org

Human Chain formed at Garware College, Pune

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Thank You. . .