



Environmental Status Report Amravati Municipal Corporation (2018-2019)



We Preserve Every Drop... We Keep Air Clean...

Environmental Status Report 2018-2019

For



Amravati Municipal Corporation

By

Megabyte Traders, Amravati.

Declaration:

We hereby declare that the Environmental Status Report of Amravati city is a record of a work carried out by Megabyte Traders, Amravati which is based solely on the assessment of secondary data provided by various government departments within given time frame, ULBs (Urban Local Bodies), and observations recorded consultations and interviews with concerned officials. The references taken from various published and unpublished reports are appropriately cited in the report.

The maps generated and incorporated in the entire report, including sections on water and land is based on the data attributes for the sub-categories of the land use pattern as per Standard classification. The data source for the concentrations of air pollutants has been procured from MPCB (Maharashtra Pollution Control Board) unless stated otherwise.

Details of the same are provided as annexes at the chapter end for reference. The section extracts its fundamental theories from literature review based on published papers, government reports and so on. The same are detailed in the chapter as relevant.

Megabyte Traders, Amravati

ACKNOWLEDGEMENT

Environmental Status Report related to health, living standard, and environment of the citizens and the Town. According to the State Law (**ACT No. LIX of 1949**) As per clause 67(A) was inserted by Mah. 41 of 1994 of Mumbai Regional Municipal Corporation Act 1949, it is mandatory to present the current environment Status Report to the General Body of Local Authority. & **Maharashtra Act No XL of 1965** (The Maharashtra Municipal Councils Nagar Panchayat and Industrial Townships Act 1965) as per section 77 sub-section (1A) by Mah. 41 of 1994, s144 Council related 74th amendment in year 1992, have made preparation of ESR.

Amravati City is emerging as a well established city in Maharashtra and its demographic and economic growth is accelerating. Considering the present situation and future needs, the improvement in the existing infrastructure and addition of new facilities has become essential. The content of this ESR may be referred during the designing and implementing new development projects. The basic facilities provided in different wards indicate city serviceable capacity.

We sincerely express our gratitude and immense respect to **Hon'ble Shri Sanjay Nipane** Municipal Commissioner, AMC, Amravati. His guidance, directions, patience meticulous tasking and painstaking efforts helped us to wide a diverse mass of information and material into a cohesive and purposeful for completion of this work.

We thank the all concern department from Amravati Municipal Corporation who help us directly or indirectly for successful completion of this report, we also express our gratitude towards **Department of Environmental Science, Shri. Shivaji Science College, Amravati** for provide us the analysis report.

We acknowledge the help and co-operation of all those, whose names we may have inadvertently forgotten to mention here.

Megabyte Traders, Amravati .

ABBREVATIONS	FULL FORM
AAQM	Ambient Air Quality Monitoring
AMC	AMRAVATI MUNICIPAL CORPORATION
BMTPC	Building Material and Promotion Council
BOT	Build, Operate and Transfer
BSNL	Bharat Sanchar Nigam Limited
Ca	Calcium
CBSE	Central Board for Secondary Education
CGWB	Central Ground Water Board
CIRT	Central Institute of Road Transport
CO	Carbon Monoxide
CPCB	The Central Public Health and Environmental Engineering Organization
Cr	Chromium
CSIR	Council for Scientific and Industrial Research
CWC	Central Water Commission
D.O.	Dissolved Oxygen
dB (A)	Decibel A- Weighted
DEM	Digital elevation Model
DGCA	Directorate General of Civil Aviation
DP	Development Plan
DPSIR	Driving Force, Pressure, State, Impact, and Response
ESR	Environmental Status Report
ETP	Effluent Treatment Plant
F	Female
Fe	Iron
GPO	Government Post Office
GSDA	Groundwater Surveys & Development Agency
HIV	Human Immune Virus
ICSE	Council for the Indian School Certificate Examinations
IRC	Indian Road Congress
IRDP	Integrated Road Developmental Program
JnNRUM	Jawaharlal Nehru National Rural Urban Mission
K	Potassium
Km	Kilo meter
lpcd	Liters per Capita per Day
M	Male
M.S.R.T.C.	Maharashtra State Road Transport Corporation
MADC	Maharashtra Airport Development Company
MIDC	Maharashtra Industrial Development Corporation
MLD	Million Liter per Day
mm	Mile Meter
Mn	Magnesium
MoEF&CC	Ministry of Environment, Forest and Climate Change
MPCB	Maharashtra Pollution Control Board
MSW	Municipal Solid Waste
MT	Metric Tonne
Na	Sodium

NATMO	National Atlas and Thematic Mapping Organization
NH	National Highway
°C	Degree Celsius
P.A.	Phenolphthalein Alkalinity
PPP	Public- private partnership
PUC	Pollution Under Control
PWD	Public Works Department
RTO	Regional Transport Office
SC	Schedule Tribe
SoE	State of Environment
ST	Schedule Tribe
T.A.	Total Alkalinity
T.D.S.	Total Dissolved Solids
T.H.	Total Hardness
TP	Total Population
UHP	Urban Heath Post
UNCED	United Nations Conference on Environment and Development
WHO	World Health Organization
WTP	Wastewater Treatment Plant
Zn	Zinc



**Detailed Project Report (DPR) of
Solid Waste Management**
AMRAVATI
District- Amravati

*SUMMARY OF PROPOSALS
AND PRESENT STATUS OF IMPLEMENTATION*

Summary of SWM Project (DPR)

Swachh Maharashtra Mission has appointed M/s MaRS Planning & Engineering Services Pvt. Ltd. Ahmadabad to perform consultancy services, for Preparation of Detailed Project Reports of solid waste Management of the for Amravati Municipal Corporation. DPR is technically sanctioned by Maharashtra Jeevan Pradhikaran (MJP) and Administrative sanction has been received by Govt of Maharashtra. Copies of the same has been enclosed.

DPR has following components

Processing and treatment is divided into three zones and windrow compost plants proposed at three sites in respective locations. It is proposed to construct the scientific landfill site at Zone-1, Sukali Site, hence inert material generated from respective zone to be disposed scientifically at sukali site. Also Bio-methanization plant is proposed at Zone-1 with capacity of 10 TPD for biodegradable components of waste such as bulk food waste which contains high organic matters.

following are the summary of proposals at respective three zones;

Sr No.	Location details of proposed site	Proposed activities
1	Zone 1: Sukhali depot, plot no. 155,156 Latitude: 20°56'1"N , Longitude: 77°43'30"E	Bio-mining of existing dump, Processing with windrow composting treatment (200TPD capacity), scientific landfill site (30976 sqm) and bio-methanization plant (10 TPD capacity).
2	Zone 2: Akoli ring road site, plot no. 26B/plot1&3 Latitude: 20°52'58"N Longitude: 77°43'7"E	Processing with windrow composting treatment (100 TPD capacity)
3	Zone 3: Kondeshwar Octroi naka site, plot 110. Latitude: 20°51'46"N Longitude: 77°44'52"E	Processing with windrow composting treatment,

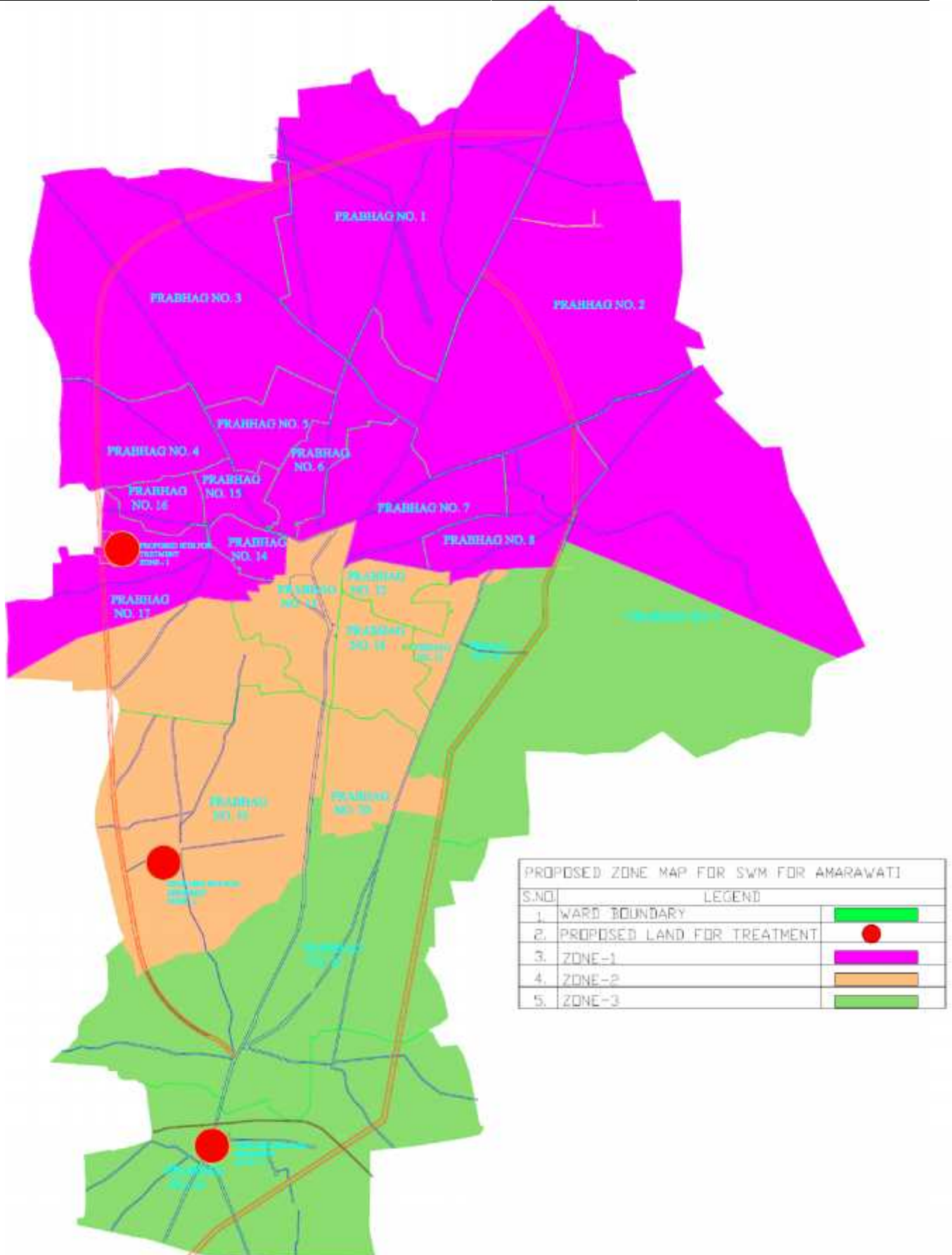
% Population covers in zone

S.No.	Zone No.	Population 2018	House Hold	Expected Waste Generation in MT	% Population covers
1	1	412323	87172	164.93	56.53
2	2	219534	46413	87.81	30.1
3	3	97494	20612	39	13.37
	Total	729351	154197	291.74	100.0

Stages of project

	Phase-I		Phase-II		Phase-III	
	@ 2028		@ 2038		@ 2048	
Zone No.	Forecasted Population	Waste Generation (in MT)	Forecasted Population	Waste Generation (in MT)	Forecasted Population	Waste Generation (in MT)
1	481179	192.47	552855	221.14	627354	250.94
2	256196	102.48	294359	117.74	334027	133.61

3	113775	45.51	130723	52.29	148337	59.33
Total	851150	340.46	977937	391.17	1109718	443.88



Collection and Transportation

Collection and transportation proposals are not included in DPR since AMC already issues collection and transportation contract separately. DPR is only for processing, treatment and scientific disposal in landfill site.

Waste Processing

It is proposed that biodegradable waste will be treated with the help of WINDROW technology followed by SCEENING, for getting quality manure. The following is the overview of the proposed processing system.

(i) Pre-processing of MSW:Pre-processing separates the material into different streams, which are suitable for specific products—biodegradable for composting, combustible dry material for RDF, separation of recyclable material Etc. Segregated MSW received at the Pre-Processing plant is weighed at the weighbridge and then dumped at the proposed Dumping Yard. The waste at the dumping yard consists of 40%–50% non-biodegradable material. The waste at the Dumping yard is pre-sorted through a simple processing machine. The processing machine will give (45%) Biodegradable Waste which will go for composting, (35%) Non-biodegradable material which will be stored at the MRF Storage Shed and (20%) Reject which will be landfilled. Items not suitable for the Processing Machine, such as glass bottle, metal container, any hazardous material like containers of paint, etc. are taken out by manual Sorting and Stored at the MRF Storage Shed. As the incoming material is proposed to have a source segregation, the pre-processing needed is minimal and reduces the capital and O& M cost.

(ii) Windrow Composting:Windrow composting process consists of placing the pre-sorted feedstock in long narrow piles called windrows that are turned on a regular basis for boosting passive aeration. The turning operation mixes the composting materials and enhances passive aeration. This activity takes six week (42 Days).

(iii) Bio Gas Plant : The waste will be collected once a day with the help of available system, all this will be crushed thru crusher in one slurry receiving tank. Here the slurry is then properly mixed with the help of mixer pump and then will be pumped to biogas digesters. The biogas produced here is initially collected in to the biogas holder and the digested slurry overflows through outlet chamber in to digested slurry tank. Generated Biogas will be stored in raw Biogas Balloon. Raw biogas from balloon will be pressurized with the help of biogas blower and then send to scrubbing section. Biogas scrubber includes H₂S scrubbers. These are proprietary scrubbers made in MS with FRP lining with packing material to remove moisture, corrosive H₂S and partly CO₂ from raw biogas before it fed to the biogas Generator to improve its life and efficiency. This clean biogas will then send to clean biogas balloon. The Biogas generated here will be utilized for power generation. Generated power can be utilized for any application (campus lightening, motors etc), agriculture application, etc.

4. Waste Disposal

Simple Landfill design is proposed which involves development of concept, adoption of suitable procedure and safety considerations. A landfill is a typical combination of different component and each of these components has to be designed separately. Before generating a complete design of sanitary landfill, design concepts for each component has been developed.

(i) Design Life:The design life of the landfill are for Amravati town has been considered as 5 years as specified in Terms of Reference. The design period is 2018-2022.

(ii) Landfill Volume and Area Required: The area required for landfill development at Amravati town is assessed based on the method suggested in CPHEEO manual. The detailed procedures and calculations have been presented in Annexure.

Capital Requirements

Zone-wise bifurcation of capital requirements

Zone-1: Sukali Zone

ZONE-1: Capital Expenditure for Processing and Disposal		
No.	Details	Amount (in Rs.)
A	Waste Processing	
1	Cost Estimates for Civil Works of Dumping Yard	24,59,892.00
3	Cost Estimates for Civil Works of Materials Recovery Facility (MRF) Shed	51,93,219.00
3	Cost Estimates for Civil Works of Windrow Platform	3,30,91,278.00
4	Cost Estimates for Civil Works of Bio-Gas Plant	2,55,90,000.00
Sub Total (A)		6,63,34,389.00
B	Waste Disposal	
5	Cost Estimates for Civil Works of Simple Landfill Site	5,00,76,643.00
Sub Total (B)		5,00,76,643.00
C	Site Development	
6	Cost Estimates for Civil Works of Security & Operating Room	3,87,429.00
7	Cost Estimates for Civil Works of Entrance Gate	0.00
8	Cost Estimates for Civil Works of Toilets	2,51,373.30
9	Cost Estimates for Civil Works of Drainage Works	10,87,322.00
10	Cost Estimates for Civil Works of Fencing Works	0.00
11	Cost Estimates for Civil Works of Pavement Works	12,81,997.00
12	Cost Estimates for Biomining of Old Dumped Waste	5,54,16,732.00
13	Cost Estimate For Green Belt Development	3,21,057.00
14	Cost Estimates For Building Block	2,27,232.00
15	Cost Estimate For Fire Safety Works	78,192.00
16	Cost Estimates For Water Supply Works	5,02,085.00
17	Electricity Arrangement, Culture & Safety Equipments	18,72,192.00
18	GST for Civil work @ 12 % (Item no. 2+3+4+5+6+7+8+9+10+11+12+14+15+17)	1,44,56,343.00
Sub Total (C)		7,58,81,954.30
D	Plant & Machinery, Vehicle and Equipments	
19	Cost Estimates for Plant & Machinery, Vehicle & Equipments	6,14,09,609.00
Sub Total (D)		6,14,09,609.00
TOTAL (=A+B+C+D)		25,37,02,595.30

Zone-2: Akoli Ring road

Zone-2: Capital Expenditure for Processing and Disposal		
No.	Details	Amount (in Rs.)
A	Waste Processing	
1	Cost Estimates for Civil Works of Dumping Yard	15,17,996.00
3	Cost Estimates for Civil Works of Materials Recovery Facility (MRF) Shed	42,65,938.00
3	Cost Estimates for Civil Works of Windrow Platform	2,11,67,800.00
4	Cost Estimates for Civil Works of Vermi Pits	0.00
Sub Total (A)		2,69,51,734.00
B	Waste Disposal	

Zone-2: Capital Expenditure for Processing and Disposal		
No.	Details	Amount (in Rs.)
5	Cost Estimates for Civil Works of Simple Landfill Site	0.0
Sub Total (B)		0.0
C	Site Development	
6	Cost Estimates for Civil Works of Security & Operating Room	3,87,429.00
7	Cost Estimates for Civil Works of Entrance Gate	0.00
8	Cost Estimates for Civil Works of Toilets	2,51,373.30
9	Cost Estimates for Civil Works of Drainage Works	5,90,224.00
10	Cost Estimates for Civil Works of Fencing Works	0.00
11	Cost Estimates for Civil Works of Pavement Works	6,41,165.00
12	Cost Estimates for Biomining of Old Dumped Waste	0.00
13	Cost Estimate For Green Belt Development	2,85,384.00
14	Cost Estimates For Building Block	2,27,232.00
15	Cost Estimate For Fire Safety Works	52,128.00
16	Cost Estimates For Water Supply Works	5,02,085.00
17	Electricity Arrangement, Culture & Safety Equipments	6,64,932.00
18	GST for Civil work @ 12 % (Item no. 2+3+4+5+6+7+8+9+10+11+12+14+15+17)	35,80,395.00
Sub Total (C)		71,82,347.30
D	Plant & Machinery, Vehicle and Equipments	
19	Cost Estimates for Plant & Machinery, Vehicle & Equipments	3,66,56,525.00
Sub Total (D)		3,66,56,525.00
TOTAL (=A+B+C+D)		7,07,90,606.30

Zone-3: Kondeshwar Octroi

Zone-3: Capital Expenditure for Processing and Disposal		
No.	Details	Amount (in Rs.)
A	Waste Processing	
1	Cost Estimates for Civil Works of Dumping Yard	8,71,115.00
3	Cost Estimates for Civil Works of Materials Recovery Facility (MRF) Shed	33,86,431.00
3	Cost Estimates for Civil Works of Windrow Platform	1,12,31,655.00
4	Cost Estimates for Civil Works of Vermi Pits	0.00
Sub Total (A)		1,54,89,201.00
B	Waste Disposal	
5	Cost Estimates for Civil Works of Simple Landfill Site	0.0
Sub Total (B)		0.0
C	Site Development	
6	Cost Estimates for Civil Works of Security & Operating Room	3,87,429.00
7	Cost Estimates for Civil Works of Entrance Gate	0.00
8	Cost Estimates for Civil Works of Toilets	2,51,373.30
9	Cost Estimates for Civil Works of Drainage Works	5,90,224.00
10	Cost Estimates for Civil Works of Fencing Works	0.00
11	Cost Estimates for Civil Works of Pavement Works	6,41,165.00
12	Cost Estimates for Biomining of Old Dumped Waste	0.00
13	Cost Estimate For Green Belt Development	2,49,712.00
14	Cost Estimates For Building Block	2,27,232.00
15	Cost Estimate For Fire Safety Works	34,752.00
16	Cost Estimates For Water Supply Works	5,02,085.00

Zone-3: Capital Expenditure for Processing and Disposal		
No.	Details	Amount (in Rs.)
17	Electricity Arrangement, Culture & Safety Equipments	4,25,940.00
18	GST for Civil work @ 12 % (Item no. 2+3+4+5+6+7+8+9+10+11+12+14+15+17)	22,00,611.00
Sub Total (C)		55,10,523.30
D	Plant & Machinery, Vehicle and Equipments	
19	Cost Estimates for Plant & Machinery, Vehicle & Equipments	2,42,55,625.00
Sub Total (D)		2,42,55,625.00
TOTAL (=A+B+C+D)		4,52,55,349.30

Total capital requirements

S. No.	Zone No.	Land details	Land Available (in Hectare)	Land Required (in Hectare)	Population Covered (In %)	DPR Cost (In Crore Rs.)
1	1	Sukhli Depot	9.35	4.79	56.53	25.37
2	2	Akoli Bypass	2.83	0.95	30.1	7.07
3	3	Badnera Pundeshwar	1.15	0.54	13.37	4.52
Total				6.28	100.0	36.97
5	IEC (For A- Class Municipal Corp. = 1 Cr. or 5% of DPR cost; whichever is less.)					1.00
6	Total Project Cost					37.97

The following is the summary of Capital Requirements for the proposed project.

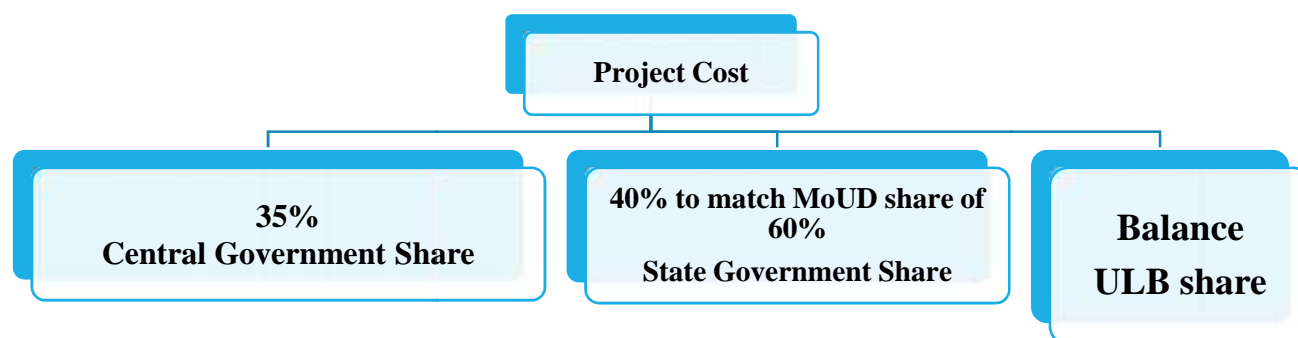
Cost of Collection & Transportation system is not considered in the DPR, because ULB already have appointed separate agency for Collection & Transportation for 9 Years.

Details	Capital Requirements in Amount (in Rs.)	Per Capita Cost As per Census 2011 Population (in Rs.)	Per Capita Cost As per 2018 Projected Population (in Rs.)
(A) Capital Requirements For Collection and Transportation	0	0	0
(B) Capital Requirements For Treatment & Disposal	36,97,48,550.90	571	507
(C) Total Capital Requirements for Project	36,97,48,550.90	571	507
(D) Capital	1,00,00,000.00	15	14

Requirements for Awareness and IEC			
---	--	--	--

Proposed Funds for Capital Expenditure

The project is proposed to be implemented by ULB. The financing structure has been designed in such a fashion that the project financing risk and the cost overloading risk are mitigated. The following is the overall financial structuring proposed for the project.



As per the table shown below, the 58.33% of the project cost will be covered from grant from Central Government (35%) and State Government (23.33%). The remainder has to be brought in by ULB.

Overall Funding Structure		
Stakeholder	INR Lakhs	%age Share
Capital Grants from Central Government	1329.15	35%
Capital Grants from State Government	885.98	23.33 %
ULB Share	1582.45	41.67 %
Total Project Cost	3797.58	100%
Source: Proposed by the consultant		

PRESENT STATUS OF IMPLEMENTATION OF DPR

Tender are prepared package wise for successful implementation of project.

Following table provides the details of tenders and latest status for implementation

Package No	Component	Particulars	Estimated Cost in Lacs	Status	Price Bids
1	BIOMING TENDER	Biomining of Sukhali Site	554.17	Contractor is finalized. Letter of Award and agreement in process	16.3 % below of the estimated cost of works
		Sub Total	554.17		
2	Site Development Works And Processing and treatment	Site Development Works (Toilet, Security Room, Pavement Works, Green Belt Development, Water Supply)	100.57	Tender for DESIGN, SUPPLY, INSTALLATION, ERECTION, COMMISSIONING and O&M has been published. Due date is 23rd July 2019	% above or below of the estimated cost of works + Tipping Fee for O&M Construction and O&M combined
		Construction of MRF Shed	128.46		
		Plant & Machinery For Waste Sorting	750.00		
		Windrow Platform	654.91		
		Dumping Yard	48.49		
		Vehicle & Equipments	473.22		
	Total for capital		2155.65		
3	Disposal	Landfill Site Disposal (including EC)* Environment Clearance applicable. To be floated as separate tender	500.77	Tender for Construction of scientific landfill site published. Due date is 23rd July 2019	% above or below of the estimated cost of works
		Sub Total	500.77		
4	INFORMATION EDUCATION AND COMMUNICATION (IEC)	Information communication and Education activities as per DPR	100.00	Tender for Information communication and Education activities as per DPR is published. Due date is 23rd July 2019	Quality Cum Cost Based selection (QCBS)
		Sub Total	100.00		

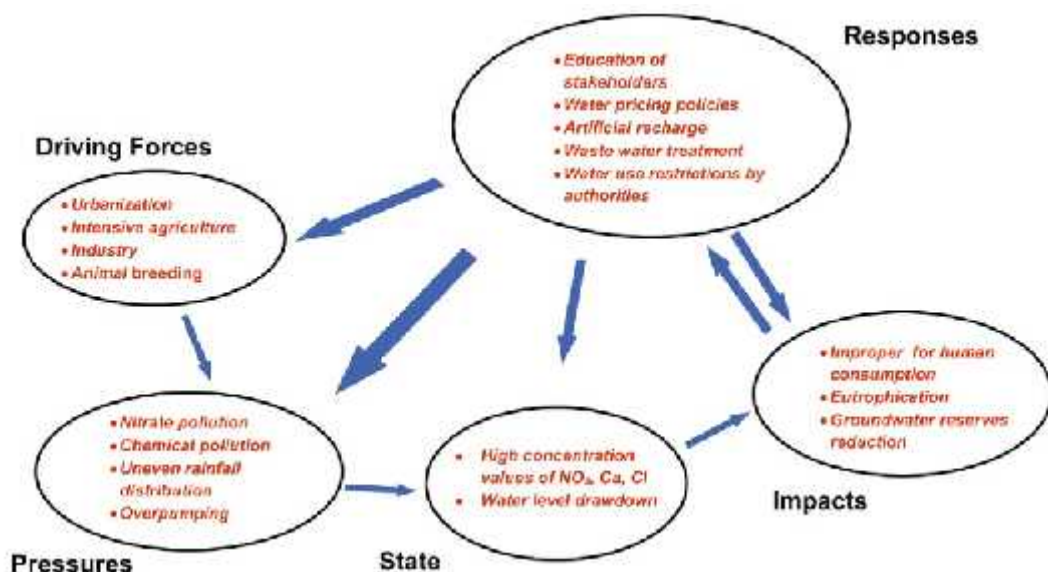
Package No	Component	Particulars	Estimated Cost in Lacs	Status	Price Bids
5	BIOGAS plant with 10 TPD	BIO GAS PLANT (10 TPD) including Civil	255.90	Tender preparation under process	% above or below of the estimated cost of works OR Lumsum Quote (single contract) Construction Separate and O&M Separate
	Sub Total		255.90		
GRAND TOTAL			3,566.49		

Note above packages costs are excluding GST.

Chapter-1

1.1 Introduction:

An Environmental Status Report is one of the forms of State of Environment (SoE) reporting with a primary function to classify the information and allow efficient understanding of complexities and interlink ages between environmental issues and causes. SoE outline is conventional and accepted worldwide, so as to complement the ESRs with universal standards. Amravati Municipal Corporation has made an effort to adopt DPSIR (Driving Force, Pressure, State, Impact, and Response for this ESR.



The views of citizens on different issues related to the environment and the daily problems they may face due to environmental degradation provide insights which can help improve the situation in our cities. The government at the national and local level has been designing and formulating new and improved policies, it is important to understand the citizens' attitudes, perception, awareness, and opinion towards their local environment.

This data is often analyzed to show trends of environmental pollution, impacts of growth and possible environmental action planning in the city. ESR is one of the forms of State of Environment Reporting (SoE). Some of the other forms of SoE are: Global Environmental Outlook, Environment Monitors, Environmental Atlas, Sustainability Report etc. These SoEs can be further categorized based on the scale or level of the scope of SoE reporting, namely: Global or Regional level, Country and State Level, City Level Corporate Level and Community Level.

1.2 Background

The Socio-economic development of a town is depending on the Facility management. This is related to health, living standard, and environment of the citizens and the Town. Due to rapid development and growing population many Environmental and Social problems are created. Therefore Maharashtra Government has made it mandatory to prepare Annual Environmental Status Report (ESR). According to State Law **(ACT No. LIX of 1949)** As per clause 67 (A) was inserted by Mah. 41 of 1994 of Mumbai Regional Municipal Corporation Act 1949, it is mandatory to present the current environment Status Report to the General Body of Local Authority. & **Maharashtra Act No XL of 1965** (The Maharashtra Municipal Councils Nagar Panchayat and Industrial Townships Act 1965) as per section 77 sub-section (1A) by Mah. 41 of 1994, s144 Council related 74th amendment in year 1992, have made preparation of ESR compulsory.

The views of citizens on different issues related to the environment and the daily problems they may face due to environmental degradation provide insights which can help improve the situation in our cities. The government at the national and local level has been designing and formulating new and improved policies, it is important to understand the citizens' attitudes, perception, awareness, and opinion towards their local environment.

1.3 History:

Looking at the history of environmental reporting it can be said that formal environmental reporting finds its roots in the Local Agenda 21 mandate that was passed in the Earth Summit of 1990 in Rio. Some initial attempts of environmental reporting are seen prior to the Summit. Under this mandate, ULBs required to undertake the preparation and publication of an annual ESR or equivalent. The ESR was expected to list city's environmental concerns, growth factors and the overall environmental degradation and improvements.

1.4 Purpose of ESR

ESRs are used to highlight the condition of the biophysical environment. ESRs also include analysis of trends or changes in the environment, analysis of the causes of these changes, assessment, and interpretation of the implications and impacts of these trends, and assessment of the actual and potential societal response to environmental problems. An effective ESR is one of the most

valuable means of informing policy makers, the public, and other stakeholders on the status of natural resources and the sustainability of resource-use patterns. Today, ESRs have emerged from being solely environment oriented to being all encompassing, interfacing with economic and social elements. Hence, the ESR report has come to identify the key driving forces that influence environmental change and policies. For any ESR to be effective, it is very essential to understand the function of the ESR in serving the requirements of the targeted audience.

Accumulation of different pollutants and their exposure to human beings needs immediate attention of the policy makers, researchers and regulatory agencies. The present study suggests that it is necessary to monitor the air quality as well as the health effects at regular intervals at strategic locations.

The purpose of ESRs is as outlined below:

- ESRs are used to highlight the condition of the biophysical environment.
- ESRs also include analysis of trends or changes in the environment, analysis of the causes of these changes, assessment and interpretation of the implications and impacts of these trends, and assessment of the actual and potential societal response to environmental problems.
- An effective ESR is one of the most valuable means of informing policy makers, the public, and other stakeholders on the status of natural resources and the sustainability of resource-use patterns.
- Today, ESRs have emerged from being solely environment oriented to being all encompassing, interfacing with economic and social elements. Hence, the ESR report has come to identify the key driving forces that influence environmental change and policies.

ESRs have been focusing on reactive decision making rather than proactive policy making. Mainstreaming of environmental considerations in the sectoral development remains outside the scope of the ESR, thus the recommendations made in the ESR remain unimplemented. The ESR framework, although compiles cross sectoral information and data, does not influence cross sectoral policies such as economic instruments (e.g. Tax rebates, incentives etc). The ESR does not address the implications of recommended Environmental Action Plans in terms of budgetary allocations. Financial deficiencies and non allocation of budgets for Action Plans remains as one of the constraints.

The DPSIR is an outcome of PSR framework (Pressure State Response)

- Driving forces of environmental change (e.g. Rate of Industrialization)
- Pressure on the environment (e.g. Discharges of Industrial waste water)
- State of environment (e.g. water quality of rivers and lakes)
- Impact on population, economy, ecosystems (e.g. water unsuitable for drinking)
- Response of the society (e.g. Segregation of municipal solid waste)

The important purpose of this structure is to collect the information on different environmental harms and the aim of environmental indicators is to communicate such environmental information to decision makers and general public.

The systematic outline of the ESR assists in drawing consequential inferences and guide responses towards environment protection and improvement in the city. Amravati city has taken the efforts to adopt the DPSIR framework given in the guidelines, and thus initiated a step to become role model for the state.

1.5 Objective of ESR

The primary objectives of ESI study is to identify and assess the potential impacts of the daily town activity on environment and proposed environmental management plans to mitigate adverse impact and enhance beneficial impact recommend good practices. The overall objective is distinguished in to the following is to the following key requirements:

- To assist in drawing meaningful inferences about the status of the environment for a city
- To provide a logical decision making structure for responses (including appropriate resource allocation) to planners and policy makers

- To communicate the status of the environment as well as proposed actions to resolve identified issues to all stakeholders including citizens

1.6 ESR Preparation Process

The ESR preparation process involves stakeholders as participatory approach as per the MPCB's guidelines. The primary objective of stakeholder consultation is to identify the city's needs through consultations with range of stakeholders. Existing status of environment, infrastructural facilities existing and issues that need to be implemented by the planners or authorities with economic provision and budget for the implementation. Suggestions for implementation and mitigation measures to be adopted at each level of development were also presented and demonstrated for future improvement.

1.7 Methodology of ESR

The overall methodology followed for the preparation of this ESR is as follows:



AMC review prepared ESRs to understand the city, its environmental concerns, past and ongoing environmental initiatives by the authorities as well as the citizens.

The reviewed ESR covers following sections on status reporting:

- About the city
- Social Environment (demographic, infrastructural activities & developments)
- Air Environment
- Noise Environment
- Water Environment
- Bio-environment (Biodiversity)
- Solid Waste Management
- Important findings (issues)
- Environmental Management Plan

Wherever applicable, information from these sections has been incorporated under relevant sub-sections of the report.

1.8 Genesis of the Report

The rapid and proposed developments would change the available environmental resources and would be stressed unless suitable measures are taken. Various efforts are in practice to improve the environmental conditions of the city through augmentation of proper distribution system, facilities for treatment of waste generated from the city, improvement in the roads under Nagarothan program, Slum Improvement, Solid waste collection and disposal system. This report represents the evaluation of the various developmental/infrastructural facilities available and analyzes the areas where action has to be taken in an environment friendly manner to avoid the unhealthy situation for the community.

The physical environment of the city constitutes Land, Climate, Vegetation, Forests, Wildlife, Wetlands, Infrastructure, Public services & utilities, Air pollution levels, Noise levels, Water pollution levels, Community facilities & services. The rapid and excessive development of the city results in deterioration of physical environment that results in the poor quality of life for citizen.

This fact is witnessed all over the world. Hence United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 established “Agenda 21” for environmental sustainability. Sustainable development is that meets the needs of people without compromising the ability of future generations to meet their own needs. The conservation of natural resources is a strong component of sustainable development. It is thus essential to monitor the physical components of environment in order to maintain the quality of life in the city and also to ensure sustainable development.

“Urban forestry, Protection of environment and Promotion of Ecological aspects” is one of the important additions in this list. Protection of environment and Promotion of Ecological aspects is wide subject that includes many sectors and departments and crosses geographical boundaries. Department like water supply, sewerage, solid waste management, storm water drains, roads, traffic, wetlands, trees, gardens, social facilities, markets, buildings, factories, slum improvement, education are all concerned with the subject.

The ultimate aims of preparation of Environmental Status Report are:

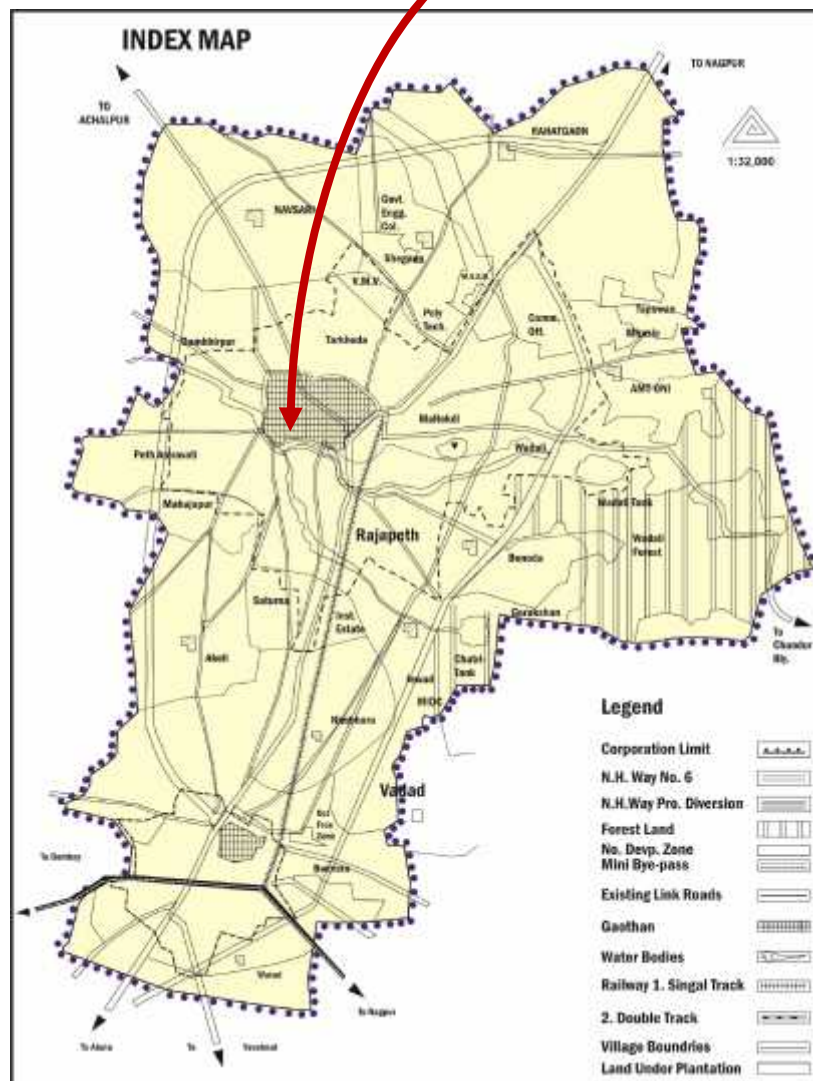
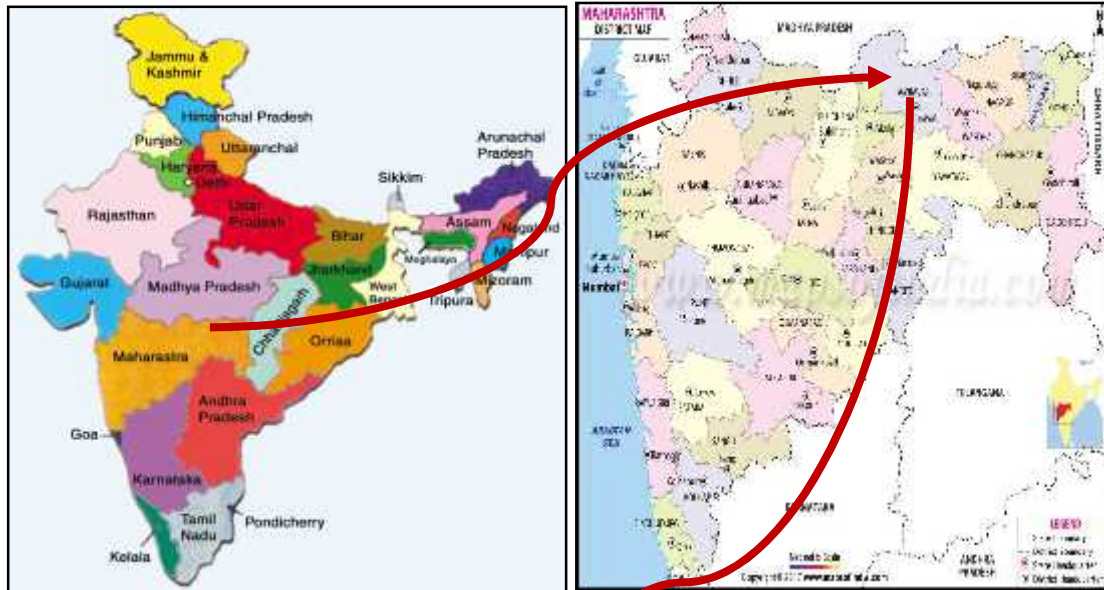
- The achievement of healthier and fuller life, including desirable environment for betterment the citizen in the city. The long-range survival and welfare of society including life supporting environment.
- Introduction of environmental management at municipal level planning, Assessing environment on yearly basis and deciding priority for short and long-term environmental actions.

Thus Environmental Status Report while assessing the present status of environmental quality attempts to identify potential problem areas, devise strategies in terms of priority areas of corrective and preventive actions, enabling institutional mechanisms, and monitoring arrangements.

2.1 Amravati Introduction

Amravati is a city in the state of Maharashtra; India and the 8th most populous metropolitan area in Maharashtra. Amravati is also the headquarters of the Amravati “Amravati Division” which is one of the six divisions of the state of Maharashtra (Amravati and Nagpur divisions together form Vidarbha region) Apart from Amravati district itself, following four districts also come under Amravati Division: 1. Akola, 2. Yavatmal, 3. Buldhana and 4. Washim 5. Amravati

Amravati city is geographically located at 20° 56' North latitude 77° 47' East longitudes. The average altitude is 340.76 m above MSL. The higher elevation area of the city is at 401.05m above MSL that is in North East part of the city while city is situated at the foot of the ranges between heights 336 m to 324 m above MSL. The total area of the Municipal Corporation is about 121.65 Sq. Km. and the population as per 2011 census record is 647057 lakh souls in Amravati Municipal Corporation. The city is located on the National Highway NH-6 leading to Mumbai in the west and Kolkata in the east. Amravati has good road, rail connectivity with almost all important cities in India. It is extremely well connected to Nagpur, Mumbai, Kolkata, and Chennai.



Index Map of Amravati City

2.2 History

Amravati known as Indrapuri the Capital of Lord Indra is famous for its ancient culture. It is said that Amravati is named for its ancient Ambadevi temple. Udumbaravati was the ancient name of today's Amravati. It was due to the presence of ample number of Audumber trees in the region. The name was further abbreviated as Umbravati, Umravati & Amravati. The city grown up rapidly at the end of 18th century due to the growth in businesses. It was one of the richest towns of the area at that time.

The ancient proof of existence of Amravati can get from stone carved inscription on the base of marble statue of God Adinath (Jain God) Rhishabh Nath. This shows that, these statues were set up here in 1097. Govind Maha Prabhu visited Amravati in 13th century, at the same time Warhad was under the rule of Deogiri's Hindu King (Yadav). In 14th century, there was famine (drought) in Amravati & people abandoned Amravati and left for Gujrat and Malva. In 1722, Chhatrapati Shahoo Maharaj presented Amravati and Badnera to Shri Ranoji Bhosle, by the time Amravati was known as Bhosle ki Amravati. The city was reconstructed and prospered by Ranoji Bhosle after the treaty of Devgaon and Anjangaon Surji and victory over Gavilgad (Fort of Chikhaldara). The Amravati city came in to existence at the end of 18th century. Union state of Nijam and Bosale ruled the Amravati city. From 1859 to 1871, many government buildings were come into existence, which were built by the Britishers. Railway station was constructed in 1859; commissioner bungalow in 1860, Small cause court in 1886, (today's S.D.O. OFFICE), the Tahsil office & the Main post office were built in 1871. During 1896, Shri Dadasaheb Khaparde, Shri Ranganath Pant Mudhodker, Sir Moropant Joshi, Shri Pralhad Pant Jog were the leaders in Amravati. The 13th Congress Conference was held at Amravati on 27-29 Dec' 1897 due to the efforts of these leaders.



Pictorial View of Amravati City Historical inheritance

2.3 Miscellanea

Shri Hanuman Vyayam Prasarak Mandal (HVPM) is a well known sports institute of Amravati. The Vidarbha Sahitya Sangha was founded in Amravati on 14 January 1923. A member of Hanuman Vyayam Prasarak Mandal, Shri Rajesh Muralidhar Mahatme (25 years) was the first person to enter the "Limca book of records" for his feat of cycling for 24 hours without a pause.

Amravati is the only city in Maharashtra of which history from the 11th Century is available. The first Finance Minister of independent India Shri Chintamanrao alias C. D. Deshmukh was an Amravatian. It was divided into two districts, South Berar or Balaghat and North Berar. In

1956, due to the reorganization of the states, Amravati was transferred from Madhya Pradesh to Bombay state. Later in 1960, with the creation of Maharashtra, Amravati became one of its districts.

Indian independence freedom fighters such as Rao Bahadur Raghunath Narasinha Mudholkar, Dadasaheb Khaparde, Moropant Vishvanath Joshi came from the city.

In 1897, the Indian National Congress assembled at Amravati. It was headed by Chettur Sankaran Nair. In an address he referred to the high-handedness of foreign administration, called for reforms and asked for self-government for India with Dominion Status. Freedom fighter Bhagat Singh hid for 3 days in Amravati during his underground stint. He is known to have frequently visited the Hanuman Akhada (Gym) in this time.

Old Amravati was once surrounded by four gates: Jawahar Gate, Kholapuri Gate, Nagpuri Gate and Amba Gate. The jewellery market (also known as Sarafa Bazaar) is located inside Jawahar Gate with renowned shops like Gajanan jewellers, Mangalam, Gawhane jewellers, Gogate Saraf, Soni jewellers, etc. There are two main parts inside the Fort wall, Bhaji Bazar and Budhwara, famous for Ganesh Chaturthi celebrations (The festival of Lord Ganesha).

The two well known Ganesh mandals of Bhaji Bazar are Chhatrapati Shivaji Mandal and Sarvajanic Mandal. In Budhwara, the oldest Famous ganesh mandal of Vidarbha Shri Laxmikant Ganeshotsav Mandal (1916) and other mandals are Azad Hind Mandal, Nilkanth Mandal, Shree Shivaji Mandal & Anant Mandal. Mandals are committees which organise various programs during the ten days Ganesh Chaturthi. There are well known temples located in old Amravati, examples include the Balkrishna temple, Someshwar Temple, Murlidhar and Bhrahmachari Maharaj Temple (Renovated by the Deodia family in 1938). The Laxmi Narayan Temple, Jain Shwetamber Temple, Kala Maroti Temple are all in Bhaji bazar. The Nilkanth Temple, Shri Krishna temple,

Ekvira Devi temple, are in Budhwara. The Amba Devi and Ekvira Devi temple are at the Amba Gate and famous Jama Masjid in Sabunpura

2.4 Amravati Municipal Corporation

The Amravati Municipal Committee forerunner of present Municipal Corporation was established on February 2nd 1887 under Local Fund Act 1869 with Deputy Commissioner as the President. Under the Central Provinces and Berar Municipalities Act 1922, every municipal committee constituted a body of elected councilors of each ward and was presided by a president elected from among the councilors.

The Amravati Municipal Corporation came into existence on August 15, 1983, comprising the areas of municipal committees of Amravati, Badnera and 17 adjoining villages which were part of the Zilla Parishad. The Amravati Zilla Parishad was constituted on 1 May 1962. The Amravati Municipal Corporation is headed by a Mayor who is assisted by the Deputy Mayor. Before March 1999 they had an office term of only one year, which has now been raised to 3 years. They carry out the work through various committees such as Standing Committee, Law Committee, Education Committee, Women and Child Welfare Committee, City Development Committee and Four Zonal Committees for the four zones. Municipal Corporation was 121.65 sq km.

2.5 Administrative Structure of Amravati Municipal Corporation

The administrative head of AMC is the Municipal Commissioner who is assisted by two Deputy Municipal Commissioners who are in turn assisted by five Assistant Municipal Commissioners and carry out the work through various Departmental Heads. The 26 municipal departments mainly are responsible for carrying the various activities & rendering services to the citizens of Amravati City. The Amravati city is divided into the 43 Prabhags grouped in 5 zones. The current functional hierarchy (macro level) is given below.

2.6 Administrative Structure

- 1) Municipal Commissioner
- 2) Deputy Municipal Commissioners
- 3) Assistant Municipal Commissioners
- 4) Departmental Heads
 - a. General Administration
 - b. Municipal Secretary
 - c. Public Works
 - d. Town Planning
 - e. Water Supply & Removal of encroachments
 - f. Public Health and Sanitation
 - g. Accounts
 - h. Audit
 - i. Lighting
 - j. Community Development
 - k. Property Tax
 - l. Local Body Tax (LBT)
 - m. Market & License
 - n. Education
 - o. Fire
 - p. Labour
 - q. Law
 - r. Garden
 - s. Sports
 - t. Public Relations
 - u. Automobile
 - v. Record
 - w. Women and Child Development
 - x. Environment Department
 - y. Statistical Department
 - z. Computer Department
- 5) Zonal Offices
 - a. Zone No 1 - Rampuri Camp
 - b. Zone No 2 - Rajapeth
 - c. Zone No 3 - Hamalpura
 - d. Zone No 4 - Badnera
 - e. Zone No. 5- Bhajibazar

2.7 Connectivity

2.7.1 Bus Connectivity



Two wheelers and city buses run by the Amravati Municipal Corporation are the major forms of transport within the city. Auto rickshaws are also popular. The Maharashtra State Road Transport Corporation (MSRTC) provides transport services for intercity and interstate travel. Many private operators also ply on the highly travelled Amravati – Pune and Amravati – Indore route. Bus services to cities like Nagpur, Bhopal, Indore, Raipur, Jabalpur, Mumbai, Pune, Akola, Nanded, Aurangabad, Parbhani Solapur, Gondia, Shirdi, Hyderabad, Kolhapur, are also available.

The NH6, which runs from Hazira to Kolkata, passes through Amravati. New concept of Women's Special City bus in Amravati which is First in Vidarbha region.

2.7.2 Railway Connectivity



In Amravati there are 3 railway stations

1. Badnera railway station
2. Amravati railway station
3. Naya Amravati railway station

Amravati railway station is situated on the branch line from Badnera on Nagpur-Bhusawal section of Howrah-Nagpur-Mumbai line of Central Railways.

Now Amravati is connected by three Railway stations (Amravati Railway Station, Badnera Railway Station, New Amravati Railway Station on Narkhed route) Amravati railway station provides multiple shuttle services to Badnera throughout the day. Along with this, following trains originate from here.

- 12159 Amravati – Jabalpur Super Fast Express (Daily at 17:45)
- 12119 Amravati – Ajni (Nagpur) Intercity Express (Monday to Friday at 05:30)
- 12112 Amravati – Mumbai Superfast Express (Daily at 19:05)
- 59026 Amravati – Surat Fast Passenger (Monday, Friday, Saturday at 09:00)
- 09050 Amravati - Udhna Fast Passenger (TUE, WED, SUN at 06.55 HOLIDAY SPECIAL)

- 51261 Amravati – Wardha Passenger (Daily at 15:30)
- 51184 Amravati – Bhusaval Passenger (Daily at 13:00) (Narkher via NEW AMRAVATI skipping Amravati)
- 12766 Amravati – Tirupati Superfast Express (Monday and Thursday at 06:55)
- 11406 Amravati – Pune Express via Akola, Purna and Latur (Monday and Saturday at 18:30)
- 51136/51138/51140/51142/51146/51148/51150 Amravati – Badnera Passenger (Daily at 02:15, 03:55, 07:15, 11:45, 18:50, 20:25, 23:40)

2.7.3 Air Connectivity



Amravati Airport, located at Belora, 15 kilometers off NH-6 towards Akola, is operated by the Maharashtra Airport Development Company (MADC). Presently it has no commercial scheduled flights. The Nagpur Flying Club has applied to DGCA for permission to shift its flying operations to Amravati airport. It also has a helipad facility. MADC is acquiring about 400 Hectares of land for developing the airport and related facilities at an estimated cost of Rs.2.25 billion. Recently Amravati Airport has been handed over to Airport Authority of India for development. The other nearest Airport is Dr. Babasaheb Ambedkar International Airport in Nagpur, 160 Kms from Amravati.

2.8 Education

Amravati is known for quality educational in Vidarbha region with all Govt. and Private Infrastructure facilities available.

2.8.1 Schools

65 Schools served by Amravati Municipal Corporation, out of which 11 no. of schools have advanced e-learning facilities by the public and private sponsor programme (**Fig. 2.1 and 2.2**). In future, AMC is planning to adopt e-learning facilities in all remaining municipal schools of the city. In spite of Municipal Corporation there are no. of trust operated schools and private schools which are provide quality of education. Some of them are enlisted below:

- Asmita Shikshan Mandal's Asmita Vidya Mandir
- Adarsha Prarthmik Shala
- Bhawarilal Samra English High School
- Deepa English Primary School
- Dnyanmata High School Amravati
- DRS Kids School
- Friends Urdu High School
- Friends English High School
- Golden Kids English High School
- Holy Cross Convent
- Indo Public School
- Friends Primary, High School & Jr. College
- Lathebai School
- Manibai Gujarati High School
- Mohanlal Samra Primary School
- Narayan Das Laddha High school New High School
- Niyazi Education Society
- Niyazi Primary, High School & Jr. College
- Oyster English School, Amravati. Pragati Vidyalaya
- Rajeshwari Vidya Mandir Association Education Society
Saraswati Vidyalaya
- School of Scholars
- Shri Ganeshdasji Rathi Vidyalaya

- Shri Shivaji M.P.H.S.School, Amravati
- Shri Ramkrishna Krida Vidyalaya
- Shri Samarth High School
- St. Francis High School, Amravati
- St. Thomas English High School, Amravati
- Takhatmal English High School
- Vanita Samaj
- Nida High School
- Vikas Vidyalaya, Vilas Nagar, Amravati
- Bhagirathi High school, Amravati
- Sant Gadge Baba Vidya Mandir, Amravati
- Indrapuri Vidyalaya, Amravati
- Vidya Bharti Vidyalaya, Amravati

These schools are affiliated to Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE).

- Navodaya Vidyalaya, Abyasa English School and Indo Public School follow CBSE pattern of learning.
- The Management of Abyasa English School has also decided to start an ICSE affiliated school, which will be known as Amravati Public School. The plan is in its initial stage.

2.8.2 Colleges

At the heart of the city is the well known government institute: The Govt. Vidarbha Institute of Science and Humanities, formerly Vidarbha Mahavidyalaya. It started out as King Edward College. It is the only college serving Amravati with maximum branches for humanities at the undergraduate and post-graduate level. The college has several renowned alumni. The institute has over 500 teaching and non-teaching staff, the maximum in any college under Amravati University.

More than 265 educational institutes operate under the management of Shivaji Education Society founded by Dr. Punjabrao Deshmukh.

Amravati is a major educational center in Central India. Major colleges affiliated to Sant Gadge Baba Amravati University include Government College of Pharmacy

Government College of Engineering, Amravati the Punjabrao Deshmukh first agricultural minister of India was from Amravati he was the father of Amravati education. and also established the Shri Shivaji education society which is old and most famous education society for quality of education. Shivaji education society is largest education society after Rayat education society in Asia.

- Government Polytechnic Amravati
- Sipna College of Engineering and Technology, Amravati
- P. R. Patil Group of Educational Institutes
- T.S.H.M.C HOMOEOPATHIC MEDICAL COLLEGE AMRAVATI Smt. Kesharbai Lahoti Mahavidyalaya
- V.Y.W.S. Dental College and Hospital, Amravati since 1989
- V.Y.W.S.'s Prof. Ram Meghe Institute of Technology & Research
- Prof Ram Meghe College of Engineering and Management.
- IBSS College of engineering & Dr. Rajendra Gode Polytechnic. Mardi Road Ghatkhed Amravati
- Degree College of Physical Education, Shree H.V.P. Mandal, Amravati
- Shree H.V.P. Mandal, Amravati was established in 1914 and is serving as a sports institution. Its members are known to have participated in the Indian independence movement. It has diversified its activities to the field of Ayurveda, education (in tribal areas), Engineering and Technology.
- In 2011, the prestigious Indian Institute of Mass Communication has set up its regional centre at Amravati University.
- New engineering colleges have sprung up in past few years including H.V.P.Mandal's College of Engg. & Technology, Sipna College of Engg. and Technology and P. R Patil Educational Institutes, IBSS college of engineering, Kamlati Gawai College of engineering, Raison

2.9 Agriculture

Like the rest of Vidharbha, the economy in Amravati is mainly dependent on agriculture.

Food grains occupy the largest cultivable area, out of which, Sorghum occupies nearly 50%. It is also the main crop of the district occupying 20% of the irrigated land area and is mainly cultivated in the Tivsa, Nandgaon-Kandeshwar, Morshi, Warud and Chandur-Railway Talukas. Cotton is an important cash crop in the district as a large part of the planes has black soil suitable for cotton, known as Regur soil or black cotton soil. The district is always among the first three districts in the State in terms of total cultivated area and production of cotton. Red gram, wheat, green chickpea, sugarcane, green chilies, oranges, sweet lime and betel leaves are the other crops grown in the district. Amravati district is also famous for oranges and along with Nagpur, tops the production of oranges in the State.

2.10 Climate

Amravati zone comes in tropical wet and dry climate, summer hot and dry winter mild to cool. Summer starts from March to June, Monsoon from July to October and winter November to February. The average maximum and minimum temperature of the district is 44.4 °C and 12.4 °C respectively. The average annual rain fall of the district 857.4 mm spread over 51 rain days.

2.11 Industrial Scenario of Amravati

Sr. No.	Head	Unit	Particulars
1.	Registered Industrial Unit	NO.	2708
2.	Total Industrial Unit	NO.	2708
3.	Registered Medium & Large Unit	NO.	47
4.	Total Industrial Unit under AMC Saturna and Gopal Nagar	NO.	504
5.	Employment In Large And Medium Industries	NO.	5240
6.	No. Of Industrial Area	NO.	12
7.	Turnover Of Small Scale Ind.	IN LACS	20645.44
8.	Turnover Of Medium & Large Scale Industries	IN LACS	36376.00

Source : MSME

2.12 Basic Amenities

AMC provides basic amenities like water supply, sewerage, sewage treatment, storm water management, solid waste collection and disposal, public toilets, crematoriums, roads, footpaths, public buildings and Biomedical waste collection and disposal facility etc. to the population residing in AMC area. AMC also provides facilities such as hospitals and dispensaries, public transport, education. These facilities are also provided by private sector. In addition AMC extends services such as fire fighting, undertakes slum improvement, development and maintenance of parks, gardens and open grounds, public libraries, tree plantation, entertainment facilities etc.

Description of Environment of Amravati City:**3.1 Land Use / Land cover**

Land-cover and land-use information are required for many different kinds of spatial planning, from urban planning at a local level up to regional development. They play an important role in agricultural policy making. Moreover, land-cover data are used as basic information for sustainable management of natural resources; they are increasingly needed for the assessment of impacts of economic development on the environment. Hence, they are fundamental for guiding decision making at various geographical levels. Land use Change' is an indicator given by DPSIR. Its objective is to reduce the urban spread out. The land, and the way it is managed, affects the entire environment. It is important to monitor changes in land use, especially rapid urbanization and urban sprawl. There is a continual need to reconcile the requirements for additional land for important uses, such as housing, industry, commerce and retailing with a desire to protect the countryside and agriculture. As per DPSIR indicators, the ideal floor area per person cannot be defined. Hence, individual cases should be considered. Floor area per person is a response indicator as well.

Indicator, 'Protected areas as percent of total areas' relates to conservation of biodiversity. Protected areas are a form of defense against changes in land use and in other human activities; if unsustainable, they can pose a threat to ecosystems and landscapes, and lead to biodiversity changes including natural habitat loss.

Urban planning is a relatively new profession that has arisen from concerns for health and maintaining wellbeing through averting diseases and illnesses associated with overcrowding, poor sanitation, and exposure to environmental pollution.

The way cities and neighborhoods are designed affects whether or not it is easy for people to walk, cycle, participate in active recreation, use public transport, and interact with neighbors and their community. It is believed that urban planning decisions have a key role to play in combating growing levels of obesity and helping prevent lifestyle related diseases through facilitating physical activity and positive mental health.

Urban planning embodies a vision that conveys the aspirations of both the government and the people. The better aligned the collective vision from both the government and the people more realistic and implementable are the plans. It does not have to paint a lofty, unattainable goal but it should be attractive and contextual- making use of the unique assets and characteristics of each place, community, or city. In fact, the more down to earth the vision is, and the more the people can relate to it, the better.

Urban planning is a coordination and communication instrument, the common document that brings together stakeholders. Just taking the example at the government level, arguments, trade-offs and compromises are better done at the table - the draft urban plan can be used as a starting point for discussions amongst agencies with different mandates and interests. Perhaps even more importantly, the final document reflects agreements and decisions from these discussions that should be upheld. It would, therefore, minimize potential conflicts amongst different agencies during implementation. This applies to all aspects of urban development from road, water, drainage, sewers, electricity and community services, health and education facilities to economic development direction and goals. Underlying this is the need for one main coordination agency and a clear division of work between the agencies as well as the various levels of government.

Environmental quality of any urban area is affected by two main factors. One of them is the prevalent use for land for different purposes and the other, the physical infrastructure. This Chapter deals with the first aspect. Different land uses generate different activities resulting into mixed uses and hence chaotic situations. Land use planning has to be deliberated by the public authority for better quality of environment in terms of public health and hygiene. It is also necessary to avoid health hazards caused by mixing of contradictory land uses like residential and industrial. A careful study of the existing land use pattern is required for making any proposal in this direction.

District Amravati laying Earthquake Hazard Zone III (Base on Atlas India 2nd Edition, BMTPC)

3.1.1 Remote Sensing Studies

Remote Sensing technology has emerged as a powerful tool in providing reliable information on various natural resources at different levels of spatial details, it has played an important role in effective mapping and periodic monitoring of natural resources including environment.

With the availability of high resolution remote sensing data, newer areas of remote sensing applications have been identified, techniques of data processing have been improved and computer based image processing systems have become more effective.

3.1.1.1. Data Used

In order to strengthen the baseline information on existing land use pattern, the following data covering approx. 20°59'21.56"N - 20°49'28.51"N latitude and 77°40'35"E - 77°50'18"E longitude are used.

A. Remote sensing data

Resource sat LISS III Imagery Data

B. Collateral data

Topo sheets and Thematic Maps: Relevant topo sheets in 1:50,000 scale of the Survey of India and land use map in 1:1,000,000 scale published by the National Atlas and Thematic Mapping Organization (NATMO) were used for registration of the satellite data. These were also used as collateral data in the digital analysis and classification of the satellite data.

3.1.1.2 Methodology

Salient features of Methodology are given below:

Acquisition of Satellite data

Data loading

Data processing

Geo-referencing Image

Rectification

Supervised Classification of Land use /Land cover

Ground Truth / field checks using Global Positioning System

Masking

The spatial resolution and the spectral bands in which the sensor collects the remotely sensed data are two important parameters for any land use survey. A resource at LISS III offers spatial resolution of 23.5 m with the swath width of 141x 141 km. The data is collected in four visible bands namely Band 1 (Blue) (0.445 -0.516 μ), Band 2 (Green) (0.506-0.595 μ), Band 3 (Red) (0.632 -0.698 μ), band 4(Near infrared) (0.757- 0.853 μ) and panchromatic Band (0.526 -0.929 μ), with orbit repeat Approximately 3 days, 40° latitude. The shapes, sizes, colors, tone and texture of several geomorphic features are visible in Ikonos data. Four spectral bands provide high degree of measurability through band combination including FCC generation, bands rationing, classification etc. These features of the resources at data are particularly important for better comprehension and delineation of the land use classes.

The digital image processing was performed on ERDAS Imagine 13 System on high-configured computer. This software package is a collection of image processing functions necessary for pre-processing, rectification, band combination, filtering, statistics, classification etc. Apart from contrast stretching, there are large numbers of image processing functions that can be performed on this station. Arc Map 10.2 is used for final layout presentation.

The satellite data from the compact disc is loaded on the hard disk and by studying quick looks (the sampled image of the appropriate area); the sub-scene of the study area is extracted.

Supervised classification using all the spectral bands can separate fairly accurately, the different land use classes at level II on the basis of the spectral responses, which involve the following three steps:

1. Acquisition of ground truth
2. Calculation of the statistics of training area
3. Classification using maximum likelihood algorithm

The training areas for classification were homogeneous, well spread throughout the scene with bordering pixels excluded in processing. Several training sets have been used through the scene for similar land use classes. After evaluating the statistical parameters of training sets, the training areas were rectified by deleting no congruous training sets and creating new ones.

3.1.2 Results

Land use refers to man's activities on land, utilitarian in nature whereas land cover denotes the vegetation cover, water body cover and artificial constructions etc.

The landuse / landcover classification system standardized by Department of Space, for mapping different agro-climatic zones has been adopted. This classification system has six major land use classes at level I and twenty-eight at level II (**Table 3.1.1**). The six major classes at level I was further enunciated in the following six categories:

Table 3.1.1 Land use/Land Cover Classification System

Sr. No.	Level – I		Level – II
1.	Built-up Land	1.1	Built-up land
		1.2	Road
		1.3	Railway
2.	Agricultural Land	2.1	Crop land
		2.2	Fallow (Residual)
3.	Forest	3.1	Evergreen/Semi-evergreen forest
		3.2	Deciduous forest
		3.3	Degraded/Scrub land
		3.4	Forest blank
		3.5	Forest plantation
		3.6	Mangrove
		3.7	Cropland in forest
4.	Wasteland	4.1	Salt affected land
		4.2	Waterlogged land
		4.3	Marshy/Swampy land
		4.4	Gullied/Ravenous land
		4.5	Land with or without scrub
		4.6	Sandy area (coastal and desert)
		4.6	Barren rocky/Stony Waste/sheetrock area
5.	Water bodies	5.1	River/Stream
		5.2	Lake/Reservoir
		5.3	Tank/Canal
6.	Others	6.1	Grassland/Grazing land
		6.2	Shifting cultivation

Built up land: It is defined as an area of human habitation developed due to non-agricultural use and that which has a cover of buildings, transport, communication utilities in association with water, vegetation and vacant lands.

Land with or without scrub: They occupy (relatively) higher topography like uplands or high grounds with or without scrub. These lands are generally prone to degradation or erosion. These exclude hilly and mountainous terrain.

Fallow land: It is described as agricultural land which is taken up for cultivation but is temporarily allowed to rest un-cropped for one or more seasons, but not less than one year. These lands are particularly those which are seen devoid of crops at the time when the imagery is taken of both seasons.

Dense Evergreen Forest: It is described as a forest, which comprises of thick and dense canopy of tall trees, which predominantly remain green throughout the year. It includes both coniferous and tropical broad-leaved evergreen trees. Semi-evergreen forest is a mixture of both deciduous and evergreen trees but the latter predominate

Water bodies: Area persistently covered by water such as river and Reservoir, lakes. Landuse / landcover distribution in the study area 05 Feb -2013 has been estimated as given below using the above classification system and digital analysis techniques.

3.1.3 Land Use

As per the city sanitation plan report The existing land use data in Amravati Municipal Corporation area has been analyzed under major land use zone such as residential, industrial, commercial, recreational, transport and communication, public and semi-public, public utility services and agricultural lands. The existing land use pattern as given in the development plan of Amravati is as given in table below. As per the information provided in the Development plan of Amravati the existing land use pattern reflects that the most predominant land use type is residential i.e. 1892 hectares (43.80% as compared to the developed area and 15% as compared to the total area), followed by public/semi public land use i.e.1036 hectares (23.98% as compared to the developed area and 8.51% as compared to the total area), followed by transport and communication i.e. 793 hectares (18.48% as compared to the developed area and 6.55% as compared to the total area). The other minor land use patterns are commercial (59 hectares), public utility (60 hectares), and recreational facilities (127 hectares). The proposed land use pattern as detailed in the development plan of Amravati is as shown in table 3.2 below.

Table 3.2 Land used in Development Plan of Amravati

Sr. No	Land Use	Area (Ha)	Percentage with Developed area	Percentage with Total Area
1.	Residential	1892	43.80	15.55
2.	Industrial	348	8.05	2.86
3.	Commercial	59	1.36	0.48
4.	Public / Semi Public	1036	23.98	8.51
5.	Public Utility	60	1.38	0.48
6.	Recreational Facilities	127	2.95	1.04
7.	Transport and Communication	793	18.48	6.55
Total Developed area		4320	100.00	35.48
8.	Water Bodies	331	-	2.72
9.	Forest Land	1167	-	9.59
10.	Agricultural / Bagayat Land	4655	-	38.30
11.	Vacant Land	1692	-	13.91
Total area		12165	-	100.00

3.1.4 Distribution of Land Use

The total geographical area within the limits of Municipal Corporation of Amravati is 121.65 sq.km. Out of which only 35.487 is developed area. The area mainly covers the residential development under Gaothan old town, newly developed slums and residential development, which is coming up around the city. It is observed that 43.80% of the developed area is under residential user, while the next user is public and semi-public - 23.98%. This is mainly because of Government and semi –government institutions and educational activities in the city, being divisional head quarter and University Center. This is followed by Transport and communication – 18.48%, mainly due to Railway Station and Railway Yard, linkage, bus depots and shops and important major roads viz, National and State Highways passing through the city and arterial roads in circulation with Corporation area. The developed area under industrial use is 8.05% to the total developed area. These industrial activities are mainly due to establishment of Maharashtra Industrial Development Corporation (MIDC), Co-operative Industrial Estate at Saturna, Ginning and Pressing Mills, Oil Mills, Saw Mills and existing spread up industrial activities in the city.

Recreational user is 2.95% of the total developed area. As per the planning standard laid down by the State govt., such recreational areas have to be to the

extent of 0.6 ha. Per. thousand population excluding National Parks, Regional Parks and the areas left as open spaces in the layout etc. It is seen that this activity is low and about 0.38 ha per thousand populations in the City of Amravati Municipal Corporation. The commercial user is developed mainly within the core area of the town. Amravati and Badnera in respect of trade and commerce including the activities of Agricultural Produce Market, Vegetable Markets etc., The developed Public utility services user is 1.38% which includes water supply, electricity, burial and cremation grounds, compost pits etc.

The forest of Melghat occupies the Gavilgad ranges of Satpuda hills, which form the Catchment area of important rivers such as the Tapi and the Wardha. The terrain is hilly. These forests are teak, yielding big size timber. Forests in the plains meet the immediate requirements of agricultural population such as fuel, small size timber, grass and grazing facilities. The major forest produce is timber. The minor forests produce constitutes various items such as bamboo, fuel, grass, minerals, horns and hides, tendu leaves and gums.

As per the development plan AMC proposed the growth of municipal area following as per pattern

3.1.5 False Colour Composite

Plates 3.1.1 depict the false colour composite of Resources at LISS III showing 225 sq.km areas around Amravati City, Maharashtra. In the image, vegetation (dense vegetation, Land with shrub,) appears red, water bodies as blue. Attributes such as colour, tone, texture, shape and size are used to interpret the image visually. Morphologically the area is elevated terrain. The Built-up area visible clearly which reflect bluish colour in FCC. Sandy soil is also depicted in the imagery by its white color.

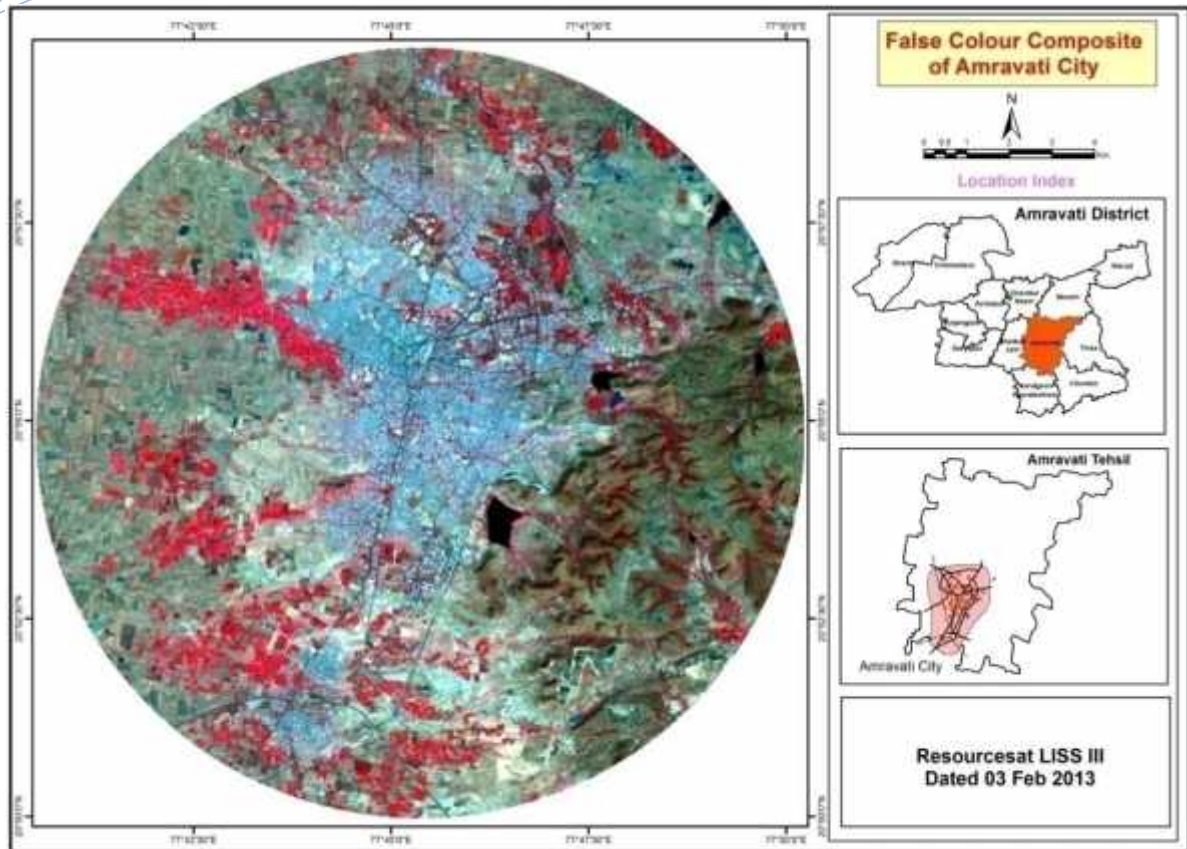


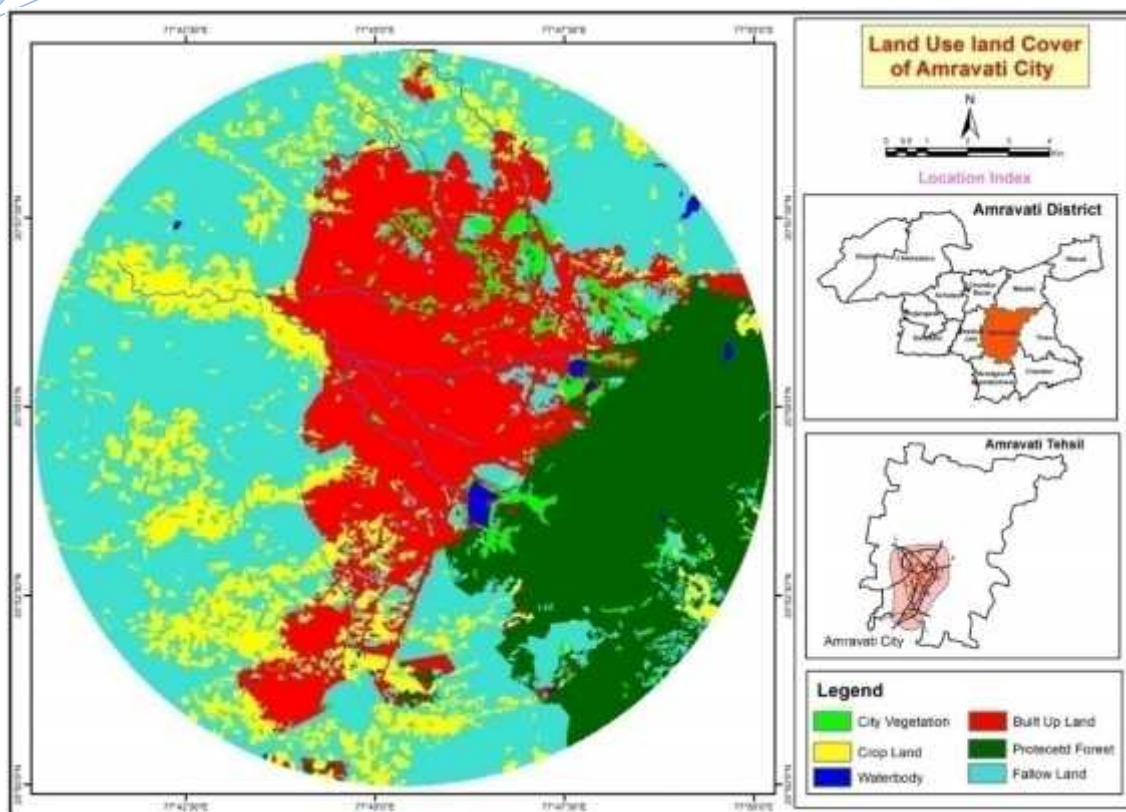
Plate 3.1.1: FCC of Study Area

3.1.6 Landuse / Landcover :

It is the colour-coded output of supervised classification with colours assigned to various classes in the study area around site. In this image, colours are assigned to various classes as given in legend. Six different classes are identified within study area. The land use / land cover classification indicates 1.90% area covered by water body.

Agricultural land is indicated by yellow colour showing 14.40%. The Protected forest area having 17.18 % of the area and assigned by the dark green colour while Built up land shows in red colour having 21.32% .The percentage of Fallow land is found to be 42.22% as assigned by Tan colour as well as City vegetation which is present in City shows 2.91% showing light green colour.

Review of **Plate 3.1.2** and **Table 3.1.2** indicate that the land use/land cover is distributed mainly over three categories that is Protected forest, Built up Land and Fallow land.

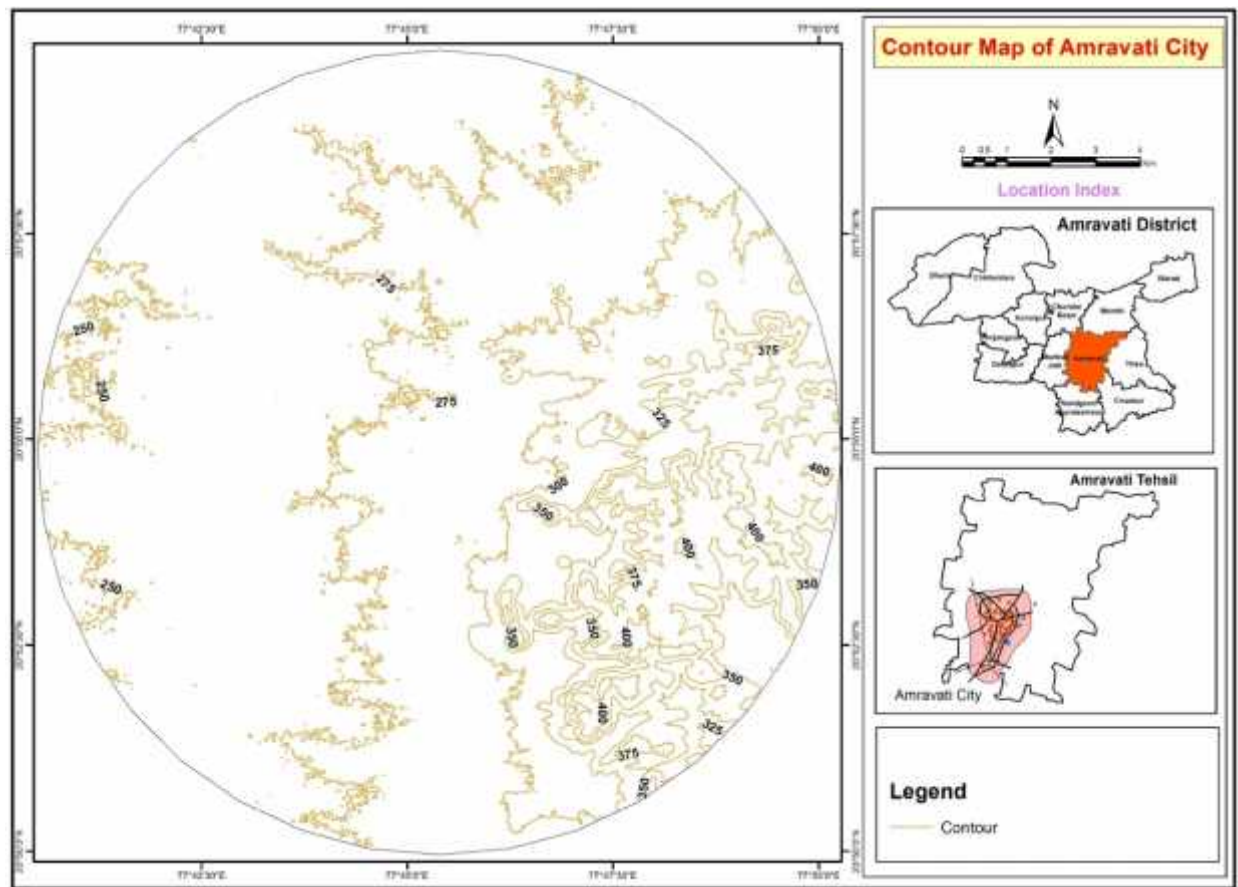
**Table 3.2 Inventory of Land use / Land cover**

Sr. No.	Land use/Land cover Classes	Area in (Sq. Km)	Area in (%)
1	Protected Forest	38.67	17.18
2	City Vegetation	6.56	2.91
3	Crop Land	32.41	14.40
4	Fallow Land	95.01	42.22
5	Water Body	4.28	1.90
6	Built-up Land	48.05	21.35
	Total	225	100

3.1.7 Generation of Contour Map

The Contours are polylines that connects points of equal value of elevation. The elevation points were prepared from toposheets on a scale of 1:50000 collected from Survey of India (SOI). The collected toposheets were scanned and registered with tic points and rectified. Further, the rectified maps were projected. All individual projected maps were finally emerged as a single layer. The contours were digitized with an interval of 20m. The contour attribute table contains an elevation attribute for each contour polylines. The contour map was prepared using Arc Map of Arc GIS 10. Contour map is a useful surface representation

because they enable to simultaneously visualize flat and steep areas, ridges, valleys shows in **Plate3.1.3** in the study area.



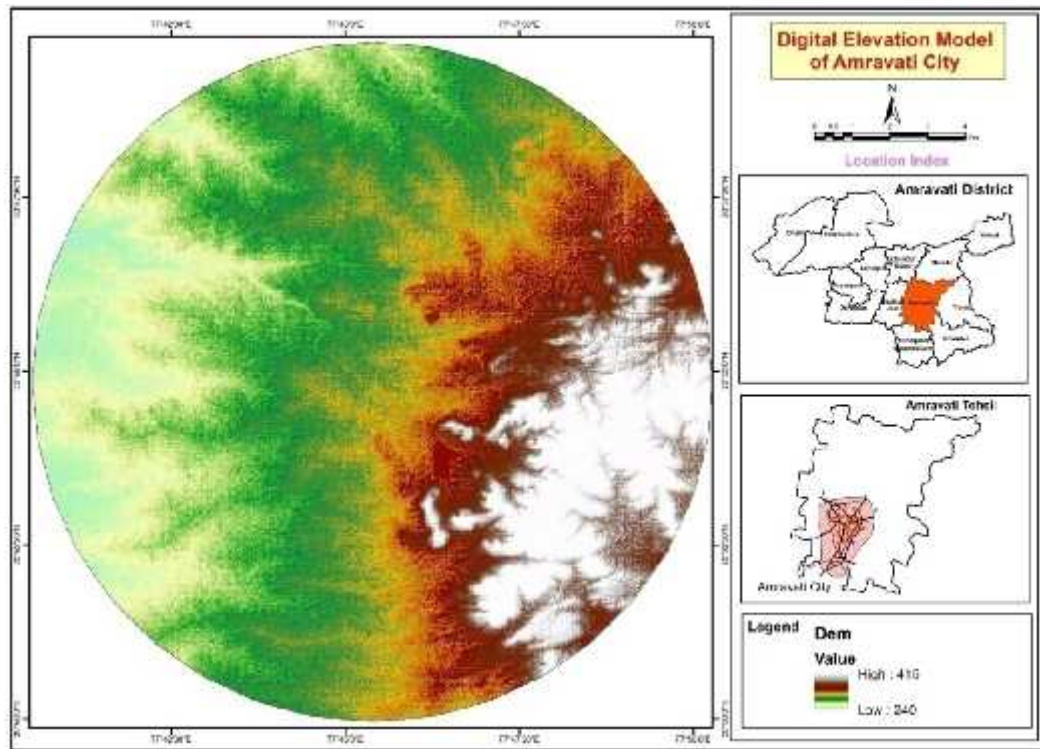
(Source AMC-ESR: 2015-2016)

Plate 3.1.3: Contour Map of Study Area

3.1.8 Digital elevation Model (DEM)

A DEM is a raster representation of a continuous surface, usually referring to the surface of the earth. The DEM is used to refer specifically to a regular grid of spot heights. It is the simplest and most common form of digital representation of topography. The Digital Elevation model for the study area was generated from the Tin. In the Study Area Digital Elevation Model Shows Highest altitude is 415 meter and lowest height is 240 meter shows in **Plate 3.1.4**.

(Source AMC-ESR: 2015-2016)

Plate 3.1.4: Digital Elevation Model Map of Study Area

(Source AMC-ESR: 2015-2016)

Plate 3.1.4: Digital Elevation Model Map of Study Area**3.1.9 Generation of Slope Map**

The Slope function in Arc GIS 10 calculates the maximum rate of change between each cell and its neighbours. Every cell in the output raster has a slope value. The lower the slope value indicates the terrain is flatter and the higher the slope value, the steeper the terrain. The output slope raster was calculated in both percent of slope and degree of slope. Slope map was prepared from the DEM. **Plate 3.1.5** shows the slope Map of study Area which is respectively 1-3%, 3-5%, 5-10%, 10-15%, and 15 -

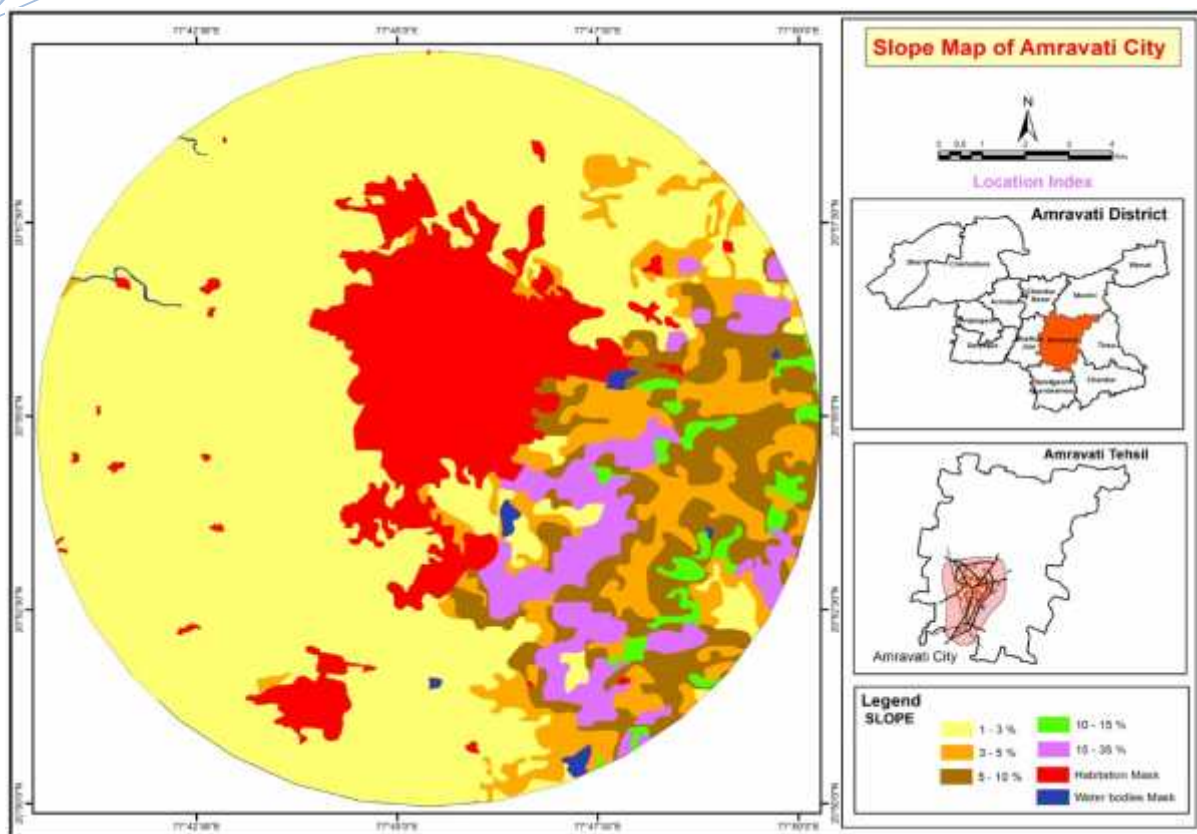


Plate 3.1.5: Slope Map of Study Area (Source AMC-ESR: 2015-2016)

Generation of watershed: Watershed of the study area was demarcated using the software Arc GIS. Drainage pattern was taken as the input data **Plate 3.1.6** shows the drainage Map of study area and **Plate 3.1.7** shows watershed of Study area which sub watershed of Pedhi and Kholad River according to Watershed management Plan Study area having **PTP 4, PTP 5, PTP 6** and WRB 1, WRBK 1, WRBK 2.

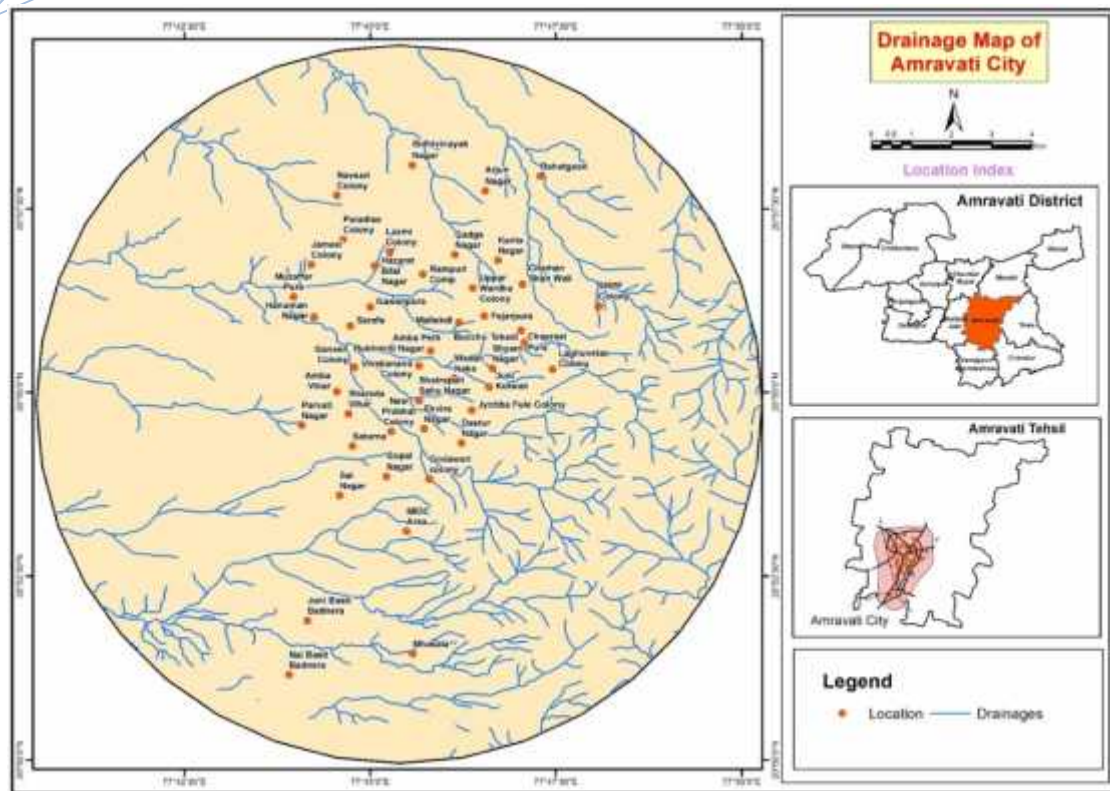


Plate 3.1.6: Drainage Map of Study Area

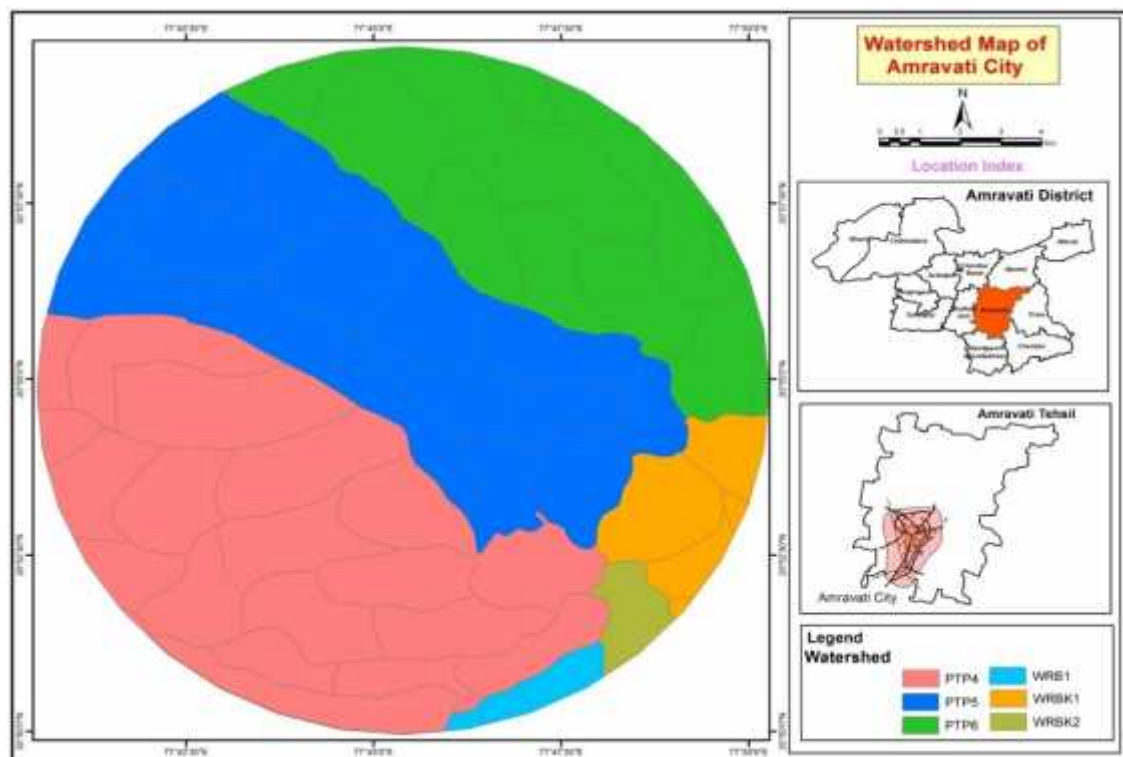


Plate 3.1.7: Watershed Map of Study Area

3.1.10 Groundwater Potential Zones Map:

Groundwater Potential Zones map of Study Area Shown in **Plate 3.1.8** having five different types of zone, they are, Good, Moderate, moderate to poor, poor and poor to nil. The Groundwater Potential Zone of Study area generated with the help of drainages, geomorphology and land use/land cover with integration of Remote Sensing and GIS technique as well as Geology of that area plays an important role. Geomorphology of the study area having alluvial plain, Denudation Hills and Plateaus. During weighed overlay analysis, the ranking has been given for each individual parameter of each thematic map and weights of 25%, 35%, 30% and 10% were assigned according to their influence for Soil, Hydro-geomorphology, Land use/Land cover, and Slope themes respectively and obtained the groundwater potential zones in terms of Good, Moderate, Moderate to Poor, Poor and Poor to nil zones in the form of a GIS map.

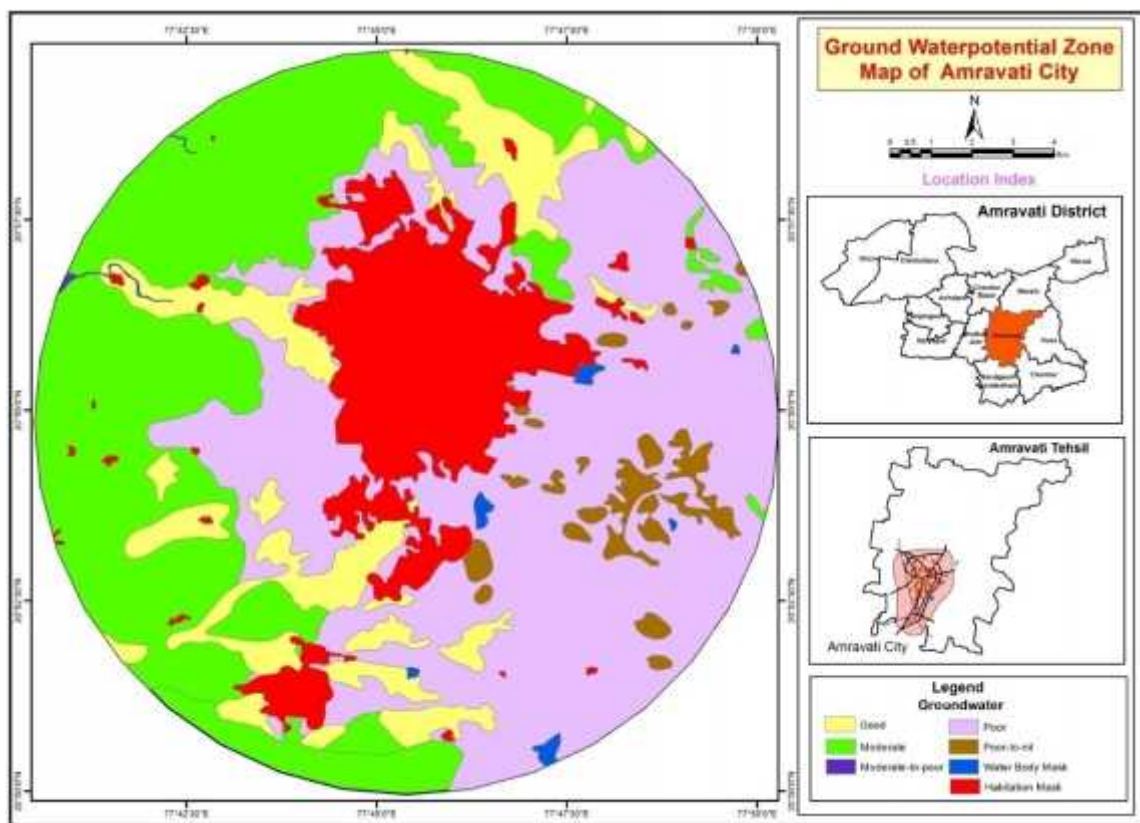


Plate 3.1.8 Groundwater Potential Zones Map

3.1.11 Geomorphology Map

Geomorphology as a science developed much later than geology although several aspects of geomorphology are embedded in geological processes. Geomorphology deals with the genesis of relief forms of the surface of the earth's crust. Geo morphological mapping and necessary supporting data are crucial to developing countries that are usually under severe environmental and demographic strains. Approaches and methods to map the variability of natural resources are important tools to properly guide spatial planning. In this paper a comprehensive and flexible new geomorphological combination legend that expands the possibilities of current geomorphologic mapping concepts. The piece-by-piece legend forms a "geomorphological alphabet" that offers a high diversity of geomorphological information and a possibility for numerous combinations of information. This results in a scientific map that is rich in data and which is more informative than most previous maps but is based on a simple legend. The system is developed to also be used as a basis for applications in GIS. **Plate 3.1.9** shows the Geomorphological Map of Study area it shows the three major components which is Alluvial Plain, Denudational Hill, and Plateau.

Alluvial Plain:

An alluvial plain is a relatively flat landform and created by the deposition of highlands eroded due to weathering and water flow in study area. The sediment from the hills is transported to the lower plain over a long period of time. It identified on the imageries dark reddish moderate to fine texture due to agriculture activities. Alluvial deposits of the area constitute gravel, sand, silt or clay sized unconsolidated material.

Denudational Hills

Denudational hills are the massive hills with resistant rock bodies that are formed due to differential erosion and weathering processes. These hills are composed of Vindhyan sediments which are fractured, jointed having no soil cover moderate to steep slope. On the satellite image, these landforms were identified by light or dark brownish with mix green colour due to thick forest cover.

Habitation Mask:

A habitation Mask is an area of land that is occupied by human being. It is human settlement area. It is defined as an area of human habitation developed due to non-agricultural use and that which has a cover of buildings, transport, communication utilities in association with water, vegetation and vacant lands.

Plateau:

A plateau is an elevated land. It is a flat topped table standing above the surrounding area. A plateau may have one or more sides with steep slopes.

Water Body:

It is an area of impounded water, areal in extent and often with a regulated flow of water. It includes man-made reservoirs/lakes/tank/canals, besides natural lakes, rivers/streams, and creeks.

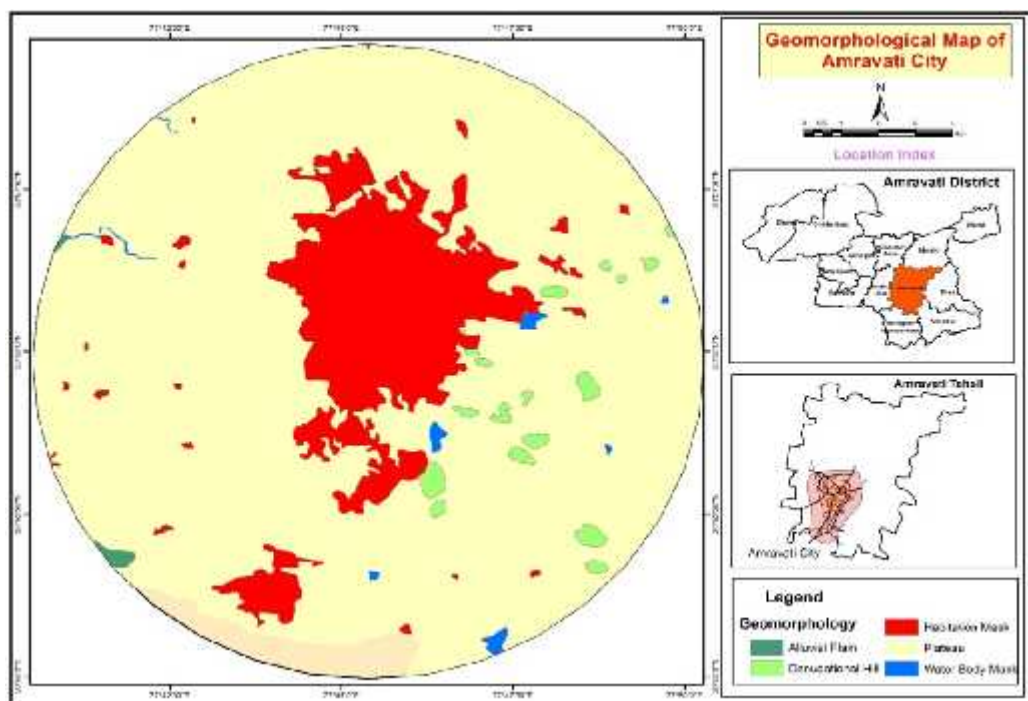


Plate 3.1.9: Geomorphological Map of Study Area

3.2 Air Environment

Air is a mixture of about 78% nitrogen, 21% oxygen, 0.9% Argon, 0.04% carbon dioxide, and very small amounts of other gases. There is an average of about 1% water vapors.

Clean air is the primary requirement to sustain healthy lives of humankind and those of the supporting ecosystems which in return affect the human wellbeing. Release of various gaseous emissions and particulate matter (PM) has been on the rise due to rampant industrialized growth. Anthropogenic emissions of various kinds are being pumped into the atmosphere (called primary pollutants) and lead to the formation of new pollutants due to chemical reactions in the atmosphere (called secondary pollutants). These are building up the concern of ambient air pollution (AAP) as a prominent global threat to human health in many ways. For instance, according to the Fifth Assessment Report of the IPCC 'nearly all the non-CO₂ climate-altering pollutants are health damaging, either directly or by contributing to secondary pollutants in the atmosphere'.

Air pollution levels remain at dangerously high level in many parts of the world. New data reevaluate that 9 out of 10 people breathe air containing high level of pollutants. Like black carbon which entrenches deep into the lungs & cardiovascular system.

World Health Organization (WHO) estimates that around 7 million people die every year from exposure to fine particles in polluted air that lead to diseases such as stroke, heart diseases, lung cancer, chronic obstructive pulmonary diseases, and respiratory infections, including pneumonia.

According to DPSIR "Air Quality" indicator is used. To minimize air pollution and its harmful effects on health, vegetation, water, and soil is the objective of this indicator. Air quality is negatively affected by emissions from mobile and point sources; these are directly linked to energy consumption, environmental policy, city density and transport by motor vehicles and concentration of industries. Assessments of the impacts of air pollution are usually divided into categories such as human health, ecosystems and building materials.

According to DPSIR, "Emissions of acidifying substances" indicator is used. The objective of this indicator is to reduce emissions from stationary and

mobile sources to meet requests of air quality standards. Sulphur dioxide (SO₂), nitrogen oxides (NO_x) and ammonia are examples of acidifying substance that are emitted into the air. Emissions from stationary and mobile sources place pressures on the air quality in a city. SO₂, NO_x and ammonia lead to acid rain and to changes in the chemical composition of soil and surface water after they are deposited. In addition, they affect flora and fauna.

3.2.1 Design of Network for Ambient Air Quality Monitoring

Ambient air quality data was collected through a well-designed air quality monitoring network. While designing the Ambient Air Quality Monitoring (AAQM) network the following criteria were taken into account:

- Topography of the study area
- Representation of regional background
- Populated and sensitive areas
- Screening of maximum ground level concentrations and distances of the likely occurrences as per climatologically normal
- Representation of valid cross sectional distribution in downwind direction

3.2.2 Air Quality Surveillance

An area within the limit of municipal corporation limit was considered as the study area for AAQM. Standard analytical procedures were used for collection of samples, analysis, and quantification of air quality parameters and are enlisted in

Standard Analytical Procedures/ Methods used for Quantification of Air Quality Parameters (Detailed Standard in Annexure-I)

Parameter (unit)	Analytical Methods Followed	NAAQS (Duration)
Particulate Matter size of less than 10 microns or PM ₁₀ (µg/m ³)	Gravimetric	100 (24 hours)
Particulate Matter of size less than 2.5 microns or PM _{2.5} (µg/m ³)	Gravimetric	60 (24 hours)
Sulphur Dioxide / SO ₂ (µg/m ³)	EPA : Improved West and Gaeke Method	80 (24 hours)
Oxides of Nitrogen / NO _x (µg/m ³)	Modified Jacobs-Hachheiser Method	80 (24 hours)
Ozone / O ₃ (µg/m ³)	Chemical Method	100 (8 hours)

Table 3.2.2
The Ambient air Quality data by MPCB as per NAAQM

Sr. No.	Zone	SO ₂ µg/m ³	NO _x µg/m ³	RSPM µg/m ³
		Permissible limit		
		80 µg/m ³	80 µg/m ³	100 µg/m ³
1	Residential Zone	14.18	15.77	74.71
2	Industrial Zone	16.05	17.99	108.91
3	Commercial Zone	17.78	18.96	118.76

Graphical Representation MPCB AAQM Data

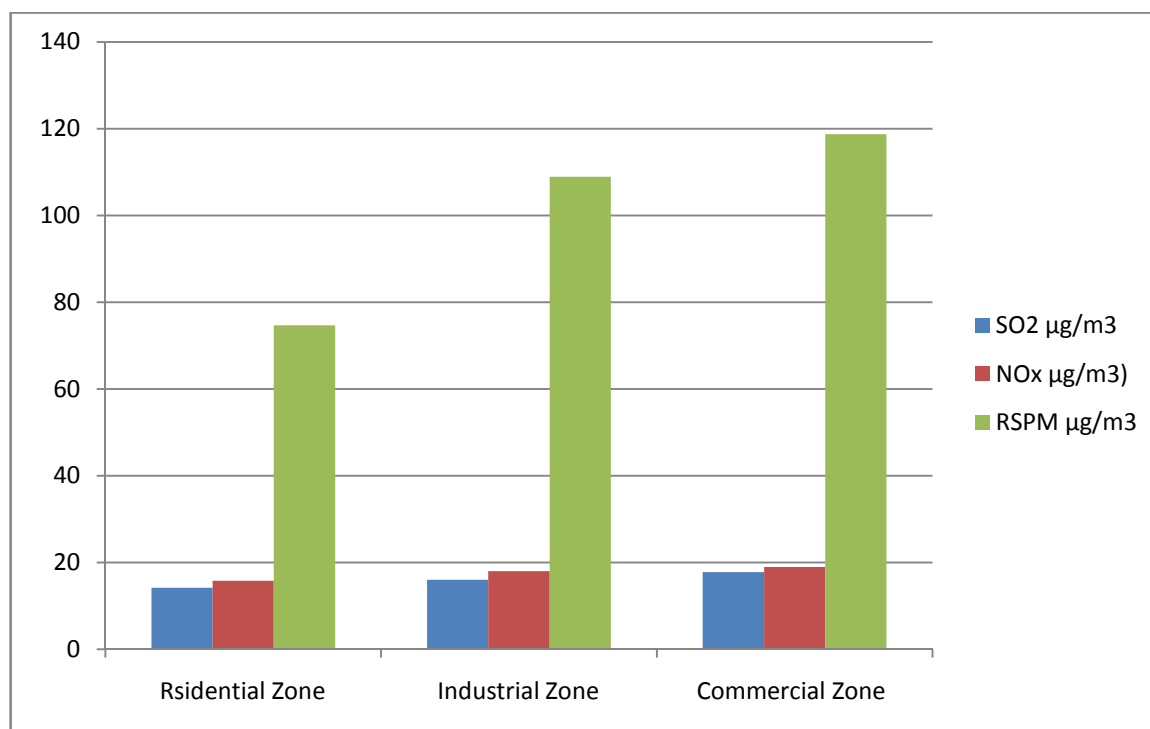


Table 3.2.3

The Ambient air Quality data by Shri Shivaji Science College

Sr. No.	Zone	SO ₂ µg/m ³)	NO _x µg/m ³)	RSPM µg/m ³)
		Permissible limit		
		80 µg/m ³	80 µg/m ³	100 µg/m ³
1	Residential Zone	13.52	14.79	72.40
2	Industrial Zone	15.36	16.56	103.09
3	Commercial Zone	17.6	16.65	112.42

Graphical Representation Shri Shivaji Science Collage Data

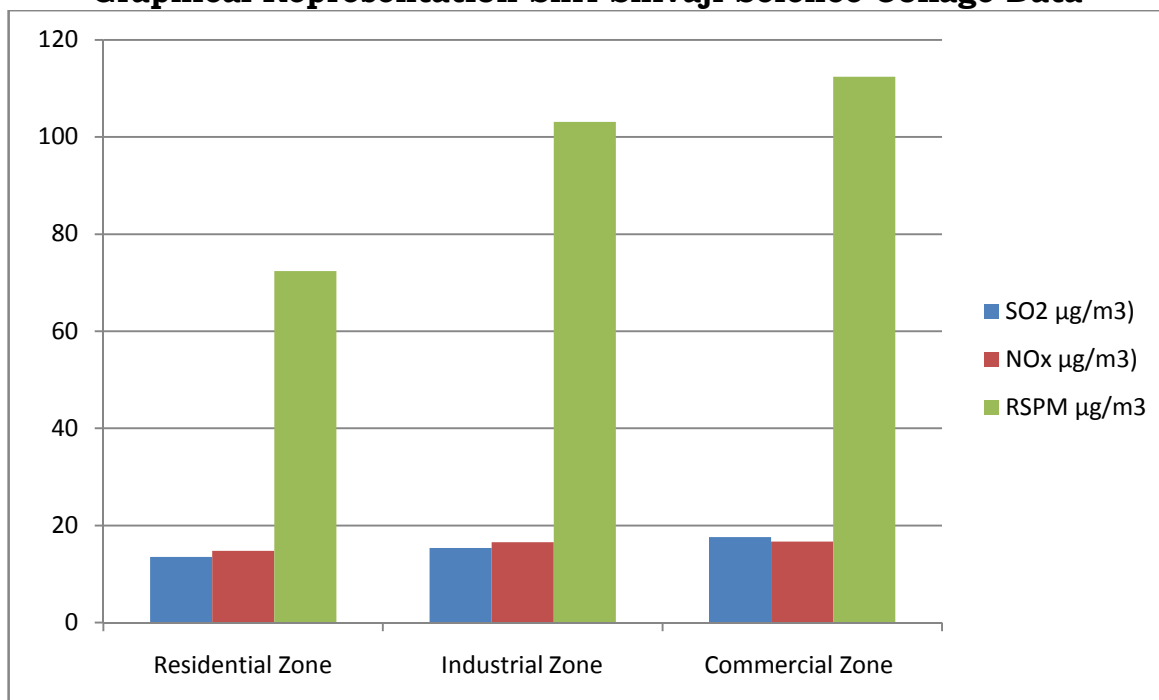
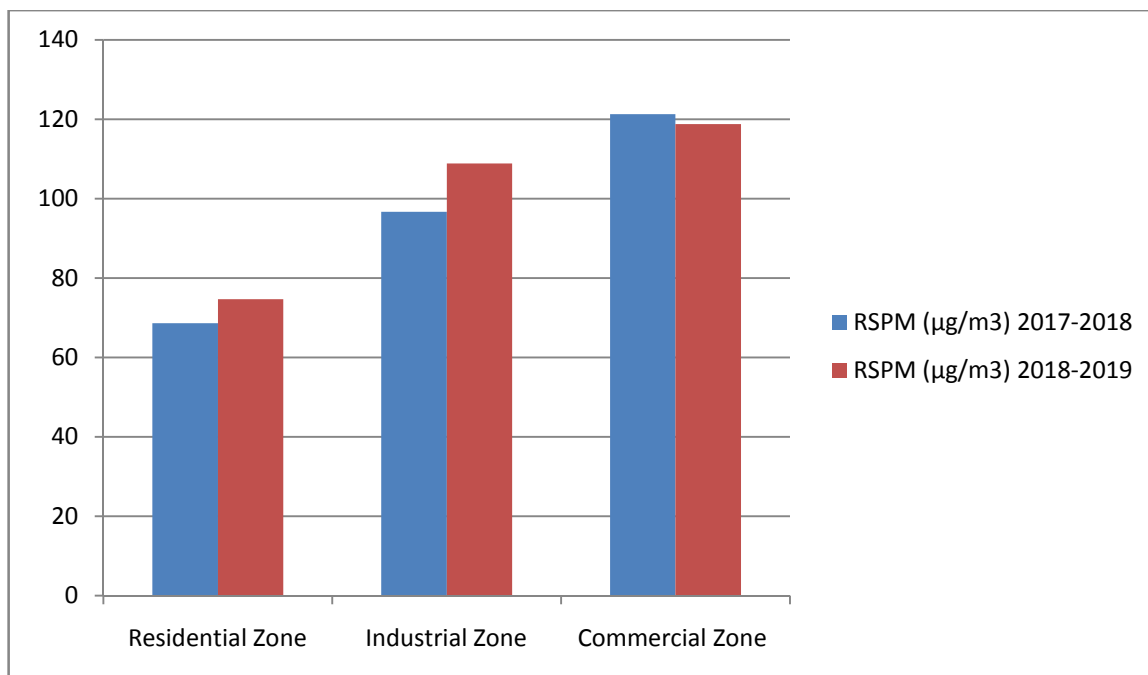


Table 3.2.4
RSPM Compression Showing in Trend of MPCB AAQM Data

Sr. No.	Zone	RSPM $\mu\text{g}/\text{m}^3$	RSPM $\mu\text{g}/\text{m}^3$
		2017-2018	2018-2019
1	Residential Zone	68.59	74.71
2	Industrial Zone	96.71	108.91
3	Commercial Zone	121.28	118.76

Chart Showing RSPM Trend of MPCB AAQM Data



3.2.3 Results

The observed data from MPCB presented in **Tables 3.2.2-3.2.3**

Air Quality Stations in Amravati			
Govt. College of Engineering	A-23 MIDC Amravati	Raja Kamal Chowk,Amravati	
Ambient Air Quality Monitored at Govt. College of Engineering			
Location: Terrace of Govt. Coll. Of Engn., Electronic & Computer Building Amravati		Type :Residential	
Program Name : NAMP		Status: In operation	
Frequency: Two days in a week			
AQI	Quality classification	Remarks	Colour code
0-50	Minimal Impact	Good	
51-100	Minor breathing discomfort to sensitive people	Satisfactory	
101-200	Breathing discomfort to the people with lung, heart disease, children and older adults	Moderate	
201-300	Breathing discomfort to people on prolonged exposure	Poor	
301-400	Respiratory illness to the people on prolonged exposure	Very Poor	
>401	Respiratory effects even on healthy people	Severe	

Concentration of Air Pollutants						
Sr.No.	Date	SO ₂ µg/m ³	NO _x µg/m ³	RSPM µg/m ³	SPM µg/m ³	AQI
Standards		80.00	80.00	100.00	---	
1	03-04-2018	12	14	80	0	80
2	06-04-2018	9	11	54	0	54
3	10-04-2018	13	14	69	0	69
4	17-04-2018	14	16	88	0	88
5	20-04-2018	16	17	92	0	92
6	24-04-2018	13	15	86	0	86
7	27-04-2018	16	18	95	0	95
May						
8	01-05-2018	21	22	97	0	97
9	04-05-2018	18	21	83	0	83
10	08-05-2018	22	24	101	0	101
11	11-05-2018	13	15	78	0	78
12	15-05-2018	19	20	95	0	95
13	18-05-2018	16	19	88	0	88
14	22-05-2018	22	24	103	0	102
15	25-05-2018	15	18	90	0	90
16	29-05-2018	11	13	74	0	74
June						
17	01-06-2018	8	9	51	0	51
18	05-06-2018	4	BDL - 5	27	0	27
19	08-06-2018	11	12	45	0	45
20	12-06-2018	12	14	77	0	77
21	15-06-2018	14	15	83	0	83
22	19-06-2018	15	17	90	0	90
23	22-06-2018	10	11	53	0	53
24	26-06-2018	6	BDL - 6	30	0	30
25	29-06-2018	9	10	62	0	62
July						
26	03-07-2018	12	13	61	0	61
27	13-07-2018	8	9	33	0	33
28	17-07-2018	15	16	73	0	73
29	20-07-2018	19	20	91	0	91
30	24-07-2018	18	19	87	0	87
31	27-07-2018	16	16	78	0	78
32	31-07-2018	21	22	95	0	95
August						
33	03-08-2018	13	15	74	0	74
34	07-08-2018	10	12	35	0	35

Environmental Status Report Amravati

35	10-08-2018	12	14	68	0	68								
36	14-08-2018	11	12	59	0	59								
37	17-08-2018	9	10	31	0	31								
38	24-08-2018	14	16	78	0	78								
39	28-08-2018	9	10	40	0	40								
40	31-08-2018	17	19	85	0	85								
October														
41	02-10-2018	13	14	69	0	69								
42	05-10-2018	19	20	90	0	90								
43	09-10-2018	15	16	58	0	58								
44	12-10-2018	16	17	76	0	76								
45	16-10-2018	18	19	91	0	91								
46	19-10-2018	15	16	87	0	87								
47	23-10-2018	13	14	62	0	62								
48	26-10-2018	17	18	86	0	86								
49	30-10-2018	16	17	74	0	74								
November														
50	02-11-2018	16	18	99	0	99								
51	06-11-2018	22	25	138	0	125								
52	09-11-2018	24	28	141	0	127								
53	13-11-2018	20	23	116	0	111								
54	16-11-2018	18	20	95	0	95								
55	20-11-2018	16	17	84	0	84								
56	23-11-2018	18	19	80	0	80								
57	27-11-2018	13	15	67	0	67								
58	30-11-2018	15	18	78	0	78								
December														
59	04-12-2018	13	15	71	0	71								
60	07-12-2018	15	16	84	0	84								
61	11-12-2018	11	13	66	0	66								
62	14-12-2018	15	16	89	0	89								
63	18-12-2018	13	15	52	0	52								
64	21-12-2018	14	17	79	0	79								
65	25-12-2018	13	15	63	0	63								
66	28-12-2018	14	16	74	0	74								
January														
67	01-01-2019	13	15	70	0	70								
68	04-01-2019	12	13	58	0	58								
69	08-01-2019	14	15	67	0	67								
70	22-01-2019	15	17	78	0	78								
71	25-01-2019	14	16	72	0	72								
72	29-01-2019	13	14	60	0	60								
February														
73	01-02-2019	11	13	67	0	67								
74	05-02-2019	14	15	75	0	75								
75	08-02-2019	16	17	90	0	90								
76	12-02-2019	14	16	83	0	83								
77	15-02-2019	15	17	92	0	92								
78	19-02-2019	13	14	79	0	79								
79	22-02-2019	12	15	86	0	86								
80	26-02-2019	11	14	71	0	71								
March														
81	01-03-2019	12	14	68	0	68								
82	05-03-2019	15	16	91	0	91								
83	08-03-2019	14	15	89	0	89								
84	12-03-2019	12	13	74	0	74								
85	15-03-2019	14	15	83	0	83								
86	19-03-2019	12	14	68	0	68								
87	22-03-2019	14	15	77	0	77								
88	26-03-2019	16	17	95	0	95								
89	29-03-2019	13	15	80	0	80								
Total		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	
89		4	24	14.20	5	28	15.79	27	141	76.64	-	-	-	

Environmental Status Report Amravati

Ambient Air Quality Monitored at A-23 MIDC Amravati

Location : Building of Apurva Oil Industries

Type : Industrial

Program Name : NAMP

Status: In operation

Frequency: Two days in a week

AQI	Quality classification	Remarks	Colour code
0-50	Minimal Impact	Good	
51-100	Minor breathing discomfort to sensitive people	Satisfactory	
101-200	Breathing discomfort to the people with lung, heart disease, children and older adults	Moderate	
201-300	Breathing discomfort to people on prolonged exposure	Poor	
301-400	Respiratory illness to the people on prolonged exposure	Very Poor	
>401	Respiratory effects even on healthy people	Severe	

Concentration of Air Pollutants							
Sr.No.	Date	SO ₂ µg/m ³	NO _x µg/m ³	RSPM µg/m ³	SPM µg/m ³	CO ₂ µg/m ³	AQI
Standards		80.00	80.00	100.00	---	---	
April							
1	04-04-2018	18	19	110	0	NA	107
2	07-04-2018	12	13	84	0	NA	84
3	11-04-2018	8	9	67	0	NA	67
4	14-04-2018	20	21	116	0	NA	111
5	18-04-2018	19	20	126	0	NA	117
6	21-04-2018	21	22	115	0	NA	110
7	25-04-2018	17	18	123	0	NA	115
8	28-04-2018	18	19	118	0	NA	112
May							
9	02-05-2018	21	22	123	0	NA	115
10	05-05-2018	13	14	110	0	NA	107
11	09-05-2018	11	12	90	0	NA	90
12	12-05-2018	15	16	117	0	NA	111
13	16-05-2018	24	25	128	0	NA	119
14	19-05-2018	16	17	115	0	NA	110
15	23-05-2018	17	18	126	0	NA	117
16	26-05-2018	12	13	98	0	NA	98
17	30-05-2018	18	19	121	0	NA	114
June							
18	02-06-2018	12	13	81	0	NA	81
19	06-06-2018	17	18	112	0	NA	108
20	09-06-2018	13	14	72	0	NA	72
21	13-06-2018	22	23	122	0	NA	115
22	16-06-2018	20	21	115	0	NA	110
23	20-06-2018	11	12	82	0	NA	82
24	23-06-2018	14	15	68	0	NA	68
25	27-06-2018	15	16	52	0	NA	52
26	30-06-2018	18	19	108	0	NA	105
July							
27	04-07-2018	15	16	117	0	NA	111
28	07-07-2018	7	BDL - 8	45	0	NA	45
29	14-07-2018	8	9	39	0	NA	39
30	18-07-2018	12	13	110	0	NA	107
31	21-07-2018	10	11	81	0	NA	81
32	25-07-2018	22	23	120	0	NA	113
33	28-07-2018	19	20	115	0	NA	110
August							
34	01-08-2018	20	21	112	0	NA	108
35	04-08-2018	17	18	109	0	NA	106
36	08-08-2018	13	14	86	0	NA	86
37	11-08-2018	18	19	114	0	NA	109
38	15-08-2018	12	13	77	0	NA	77
39	18-08-2018	11	11	67	0	NA	67
40	22-08-2018	19	14	78	0	NA	78
41	25-08-2018	17	18	118	0	NA	112
42	29-08-2018	22	23	112	0	NA	108
October							
43	03-10-2018	20	20	121	0	NA	114

Environmental Status Report Amravati

44	06-10-2018	17	18	112	0	NA	108										
45	10-10-2018	22	23	123	0	NA	115										
46	13-10-2018	18	20	116	0	NA	111										
47	17-10-2018	14	15	102	0	NA	101										
48	20-10-2018	16	19	114	0	NA	109										
49	24-10-2018	12	12	99	0	NA	99										
November																	
50	03-11-2018	22	26	134	0	NA	123										
51	07-11-2018	27	29	152	0	NA	135										
52	10-11-2018	23	25	145	0	NA	130										
53	14-11-2018	21	26	137	0	NA	125										
54	17-11-2018	19	21	128	0	NA	119										
55	21-11-2018	16	17	116	0	NA	111										
56	24-11-2018	18	20	123	0	NA	115										
57	28-11-2018	12	14	115	0	NA	110										
December																	
58	01-12-2018	11	12	97	0	NA	97										
59	05-12-2018	14	15	113	0	NA	109										
60	08-12-2018	12	13	106	0	NA	104										
61	12-12-2018	16	17	117	0	NA	111										
62	15-12-2018	23	24	124	0	NA	116										
63	19-12-2018	15	16	108	0	NA	105										
64	22-12-2018	18	19	118	0	NA	112										
65	26-12-2018	13	14	105	0	NA	103										
66	29-12-2018	21	22	119	0	NA	113										
January																	
67	02-01-2019	12	13	112	0	NA	108										
68	05-01-2019	11	12	102	0	NA	101										
69	09-01-2019	15	16	118	0	NA	112										
70	12-01-2019	19	20	124	0	NA	116										
71	16-01-2019	17	14	115	0	NA	110										
72	19-01-2019	13	14	121	0	NA	114										
73	23-01-2019	15	16	109	0	NA	106										
74	26-01-2019	15	17	123	0	NA	115										
75	30-01-2019	17	18	113	0	NA	109										
February																	
76	02-02-2019	13	14	90	0	NA	90										
77	06-02-2019	16	17	101	0	NA	101										
78	09-02-2019	18	19	116	0	NA	111										
79	13-02-2019	21	22	126	0	NA	117										
80	16-02-2019	20	21	119	0	NA	113										
81	20-02-2019	15	16	104	0	NA	103										
82	23-02-2019	14	15	98	0	NA	98										
83	27-02-2019	17	18	115	0	NA	110										
March																	
84	02-03-2019	12	13	103	0	NA	102										
85	06-03-2019	17	18	124	0	NA	116										
86	09-03-2019	12	13	108	0	NA	105										
87	13-03-2019	16	17	122	0	NA	115										
88	16-03-2019	13	14	144	0	NA	129										
89	20-03-2019	17	18	126	0	NA	117										
90	23-03-2019	12	13	117	0	NA	111										
91	27-03-2019	12	13	128	0	NA	119										
92	30-03-2019	17	18	109	0	NA	106										
Total		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	
92		7	27	16.09	8	29	17.12	39	152	109.02	-	-	-	-	-	-	

Environmental Status Report Amravati

Ambient Air Quality Monitored at Raja Kamal Chowk, Amravati	
Location : Vanita Samaj Building	Type : Rural & other Areas
Program Name : NAMP	Status: In operation
Frequency: Two days in a week	

AQI	Quality classification	Remarks	Colour code
0-50	Minimal Impact	Good	
51-100	Minor breathing discomfort to sensitive people	Satisfactory	
101-200	Breathing discomfort to the people with lung, heart disease, children and older adults	Moderate	
201-300	Breathing discomfort to people on prolonged exposure	Poor	
301-400	Respiratory illness to the people on prolonged exposure	Very Poor	
>401	Respiratory effects even on healthy people	Severe	

Print

Concentration of Air Pollutants						
Sr.No.	Date	SO ₂ µg/m ³	NO _x µg/m ³	RSPM µg/m ³	SPM µg/m ³	AQI
Standards		80.00	80.00	100.00	---	
April						
1	02-04-2018	18	19	104	0	103
2	05-04-2018	17	18	118	0	112
3	09-04-2018	13	14	105	0	103
4	12-04-2018	19	20	114	0	109
5	16-04-2018	22	23	134	0	123
6	19-04-2018	16	17	121	0	114
7	23-04-2018	23	24	124	0	116
8	26-04-2018	18	19	137	0	125
9	30-04-2018	21	22	126	0	117
May						
10	03-05-2018	15	16	121	0	114
11	07-05-2018	24	25	137	0	125
12	10-05-2018	16	18	128	0	119
13	14-05-2018	22	23	134	0	123
14	17-05-2018	18	19	123	0	115
15	21-05-2018	27	29	140	0	127
16	24-05-2018	16	17	118	0	112
17	28-05-2018	21	22	131	0	121
18	31-05-2018	14	15	115	0	110
June						
19	04-06-2018	24	25	122	0	115
20	07-06-2018	19	20	108	0	105
21	11-06-2018	23	24	124	0	116
22	14-06-2018	26	27	135	0	123
23	18-06-2018	22	23	126	0	117
24	21-06-2018	19	20	114	0	109
25	25-06-2018	12	13	90	0	90
26	28-06-2018	14	16	79	0	79
July						
27	02-07-2018	22	23	121	0	114
28	05-07-2018	10	11	78	0	78
29	09-07-2018	12	13	90	0	90
30	12-07-2018	11	12	82	0	82
31	16-07-2018	17	18	117	0	111
32	19-07-2018	19	20	126	0	117
33	26-07-2018	24	25	133	0	122
34	30-07-2018	21	22	129	0	119
August						
35	02-08-2018	15	17	111	0	107
36	06-08-2018	13	15	117	0	111
37	13-08-2018	14	16	108	0	105
38	16-08-2018	8	9	82	0	82
39	23-08-2018	16	18	113	0	109
40	27-08-2018	24	25	128	0	119
41	30-08-2018	21	22	121	0	114

Environmental Status Report Amravati

October															
42	01-10-2018	21		22		120		0		113					
43	04-10-2018	18		21		118		0		112					
44	08-10-2018	22		24		124		0		116					
45	11-10-2018	13		15		115		0		110					
46	15-10-2018	19		20		123		0		115					
47	18-10-2018	16		19		116		0		111					
48	22-10-2018	22		24		109		0		106					
49	25-10-2018	15		18		117		0		111					
November															
50	29-11-2018	19		21		129		0		119					
December															
51	03-12-2018	12		13		103		0		102					
52	06-12-2018	21		22		123		0		115					
53	10-12-2018	15		17		108		0		105					
54	13-12-2018	22		23		128		0		119					
55	17-12-2018	13		14		115		0		110					
56	20-12-2018	19		20		125		0		117					
57	24-12-2018	15		17		114		0		109					
58	27-12-2018	18		19		121		0		114					
59	31-12-2018	25		26		132		0		121					
January															
60	03-01-2019	16		17		128		0		119					
61	07-01-2019	15		16		119		0		113					
62	10-01-2019	17		18		125		0		117					
63	14-01-2019	13		14		131		0		121					
64	17-01-2019	24		25		115		0		110					
65	21-01-2019	18		19		130		0		120					
66	24-01-2019	23		24		122		0		115					
67	28-01-2019	21		22		117		0		111					
68	31-01-2019	18		19		125		0		117					
February															
69	04-02-2019	13		14		119		0		113					
70	07-02-2019	21		22		124		0		116					
71	11-02-2019	14		15		115		0		110					
72	14-02-2019	17		18		121		0		114					
73	18-02-2019	11		13		114		0		109					
74	21-02-2019	24		25		128		0		119					
75	25-02-2019	16		17		117		0		111					
76	28-02-2019	23		24		123		0		115					
March															
77	04-03-2019	12		13		122		0		115					
78	07-03-2019	14		15		115		0		110					
79	11-03-2019	16		17		129		0		119					
80	14-03-2019	15		12		118		0		112					
81	18-03-2019	13		14		127		0		118					
82	21-03-2019	15		16		114		0		109					
83	25-03-2019	19		20		131		0		121					
84	28-03-2019	17		18		123		0		115					
Total		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg		
84		8	27	17.81	9	29	19.00	78	140	118.76	-	-	-		

3.3 Noise Environment

Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms. According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms, regardless of how long or consistent the exposure is. Exposure for more than 8 hours to constant noise beyond 85 dB may be hazardous. If you work for 8 hours daily in close proximity to a busy road or highway, you are very likely exposed to traffic noise pollution around 85dB.

Assessment of noise impacts and the significance are dependent upon the number of factors such as the ambient or background noise levels in the vicinity of the site, the type of development and its operating characteristics. Therefore noise monitoring was carried out to identify and quantify, so far as reasonably possible, the ambient condition to predict the increase in noise levels and causes of variability of noise levels as a result of the proposed development.

Unwanted sound is noise. The noise problem is said to exist when the sound level in the air causes interference in human activities such as disturbance in sleep, work, and speech communication leading to annoyance.

The objective of survey of noise environment around the proposed site is to assess background noise levels through field studies within the study area.

3.3.1 Methodology for Noise Monitoring

Noise standards have been notified for different types of land use, i.e. residential, commercial, industrial and silence zones, as per 'The Noise Pollution (Regulation and Control) Rules, 2000, notified by the Ministry of Environment and Forests (MoEF&CC), New Delhi on February 14, 2000. Different standards have been stipulated during day time (6 am to 10 pm) and night time (10 pm to 6 am) **(Detailed Standard in Annexure-I).**

The noise rating method as Leq i.e. equivalent sound pressure level has been adopted for the measurement of noise level in various selected sampling locations of this region. It is the energy means of the noise level over a specified period and is expressed in terms of decibels.

$$L_{eq} = 10 \log \left(\frac{1}{T} \int_0^T 10^{L_P(t)/10} dt \right) \text{ dB(A)}$$

The noise scale A-weighted network in dB (A) was used for monitoring of noise level. Leq in dB (A) denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of human ear.

The residential, commercial, and silence zones in the study area have been identified. Some of the locations were identified which were away from the major roads and major noise sources so as to measure ambient noise levels. Equivalent noise levels {Leq (A)} for a period of about 60 minutes were measured at each monitoring location during day time and night time. Studies pertaining to noise environment were conducted as follows:

Identification and characterization of noise sources

Measurements of baseline noise level and vehicular count in study area

3.3.2.1 Noise Levels in Residential Zone

The equivalent noise levels at different residential locations within the study area for three seasons are shown in **Table 3.3.1**. The noise levels varied between 52 dB (A) in day time and 45 dB (A) in night time.

3.3.2.2 Noise Level in Commercial Zone

The equivalent noise levels at different commercial locations within the study area for three seasons are shown in **Table 3.3.1**. The noise levels varied in the range of 75 dB (A) in daytime and 47 dB (A) in night time.

3.3.2.3 Noise Level in Silent Zone

Amravati Municipal Corporation carried out survey to identify the silent zone in the city after detailed study 478 location was identified as a silent zone as represented in **Fig. 3.3.1** and detailed list in **Annexure I-E**. The equivalent noise levels at different silent locations within the study area for three seasons are shown in **Table 3.3.1**. Noise levels were found to be 66 dB (A) during daytime and 53 dB (A) during night time respectively.

3.3.2.4 Noise Level in Industrial Zone

The equivalent noise levels at different locations in industrial areas within the study area for three seasons are shown in **Table 3.3.1** Noise levels were found to be 62 dB(A) during daytime and 48 dB(A) during night time respectively.

3.3.2.5 Noise Area during Festival Season in Amravati

Ambadevi Yatra (Durga Festival)

The equivalent noise levels at different locations during the Durga Festival within the study area are shown in **Table 3.3.3** Noise levels were found to be 64 dB (A) during daytime and 49 dB(A) during night time respectively.

Ganesh Festival

The equivalent noise levels at different locations during Ganesh festival within the study area are shown in **Table 3.3.2**. Noise levels were found to be 63 dB(A) during daytime and 49 dB(A) during night time respectively.

Table 3.3.1
Ambient Noise Levels of the Study Area

Sr. No.	Monitoring Stations			Day	Night
A. Residential Zone (CPCB Standards:Day:55,night 45 dB(A) Leq)					
1.	Rukhmini Nagar			57	41
2.	Ambapeth			60	43
3.	Vilasnagar			63	45
4.	Dastur Nagar			56	40
5.	Sanmati Colony			52	37
6.	Jamil Colony			62	44
7.	Gopalnagar			57	41
8.	Sanjeevani Colony			54	41
9.	Vishnu Nagar			53	39
10.	Badnera Juni Basti			60	46
11.	Sai Nagar			51	37
12.	Harshraj Colony			51	37
13.	Ravi Nagar			56	41
14.	Gadge Nagar			58	44
	Minimum	Maximum	Average		
Day	51	63	56.5		
Night	37	46	41.18		

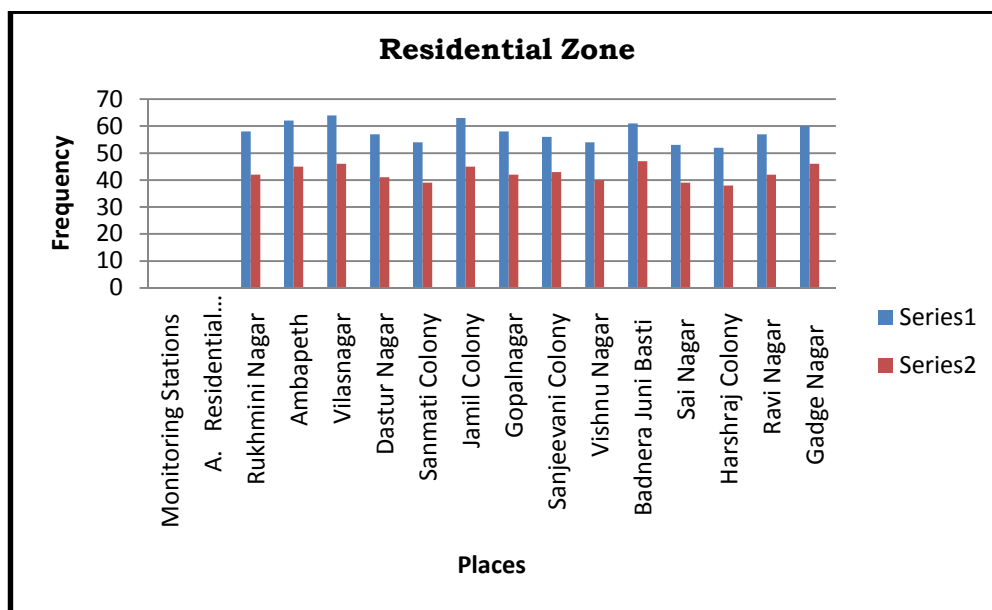


Fig 3.7: Ambient Noise Levels of the Residential Zone

B. Commercial Zone (CPCB Standards:Day:65,night 55 dB(A)Leq)				
15.	Old Cotton Market Chowk			66 48
16.	Rajkamal Chowk			72 49
17.	Near Dasera Maidan			68 48
18.	Near Pathanpura			69 47
19.	Near Itwara			74 49
20.	Main Bus Stand			71 48
21.	Shegav Naka			67 44
22.	Panchawati Chowk			68 46
23.	Near Gopal Nagar Square (D-mart)			66 43
24.	Badnera Bazar			69 45
	Minimum	Maximum	Average	
Day	66	75	68.72	
Night	43	49	46.70	

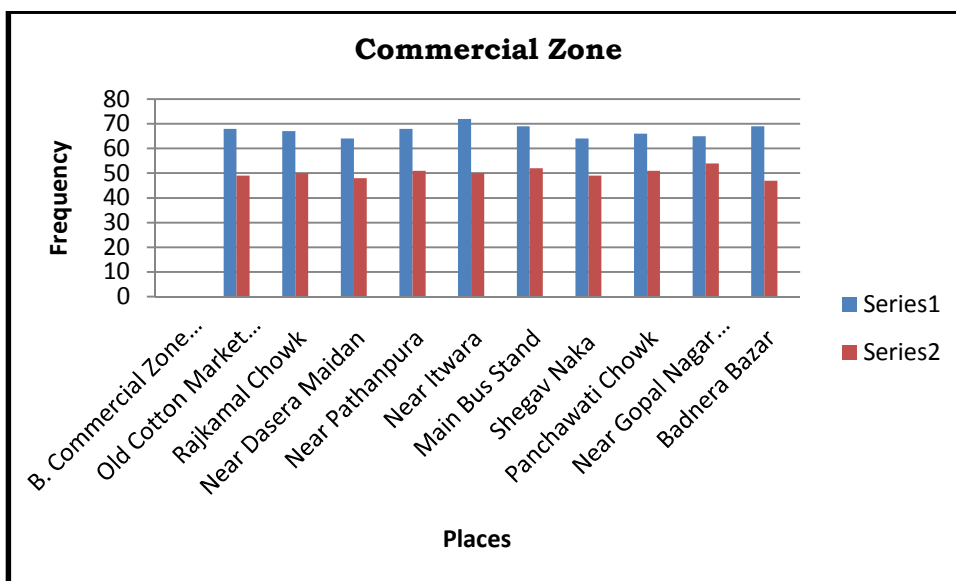


Fig 3.8: Ambient Noise Levels of the Commercial zone

C. Silence zone (CPCB Standards:Day:50,night 40dB(A)Leq)				
25.	Irwin Hospital			66 53
26.	Mahila Mahavidhyala			64 51
27.	Shri Shivaji Science College			61 52
28.	V.M.V Amravati			60 49
29.	Bonde Hospital			65 50
30.	Dhanvantari Hospital			63 49
	Minimum	Maximum	Average	
Day	60	66	63.16	
Night	49	53	50.67	

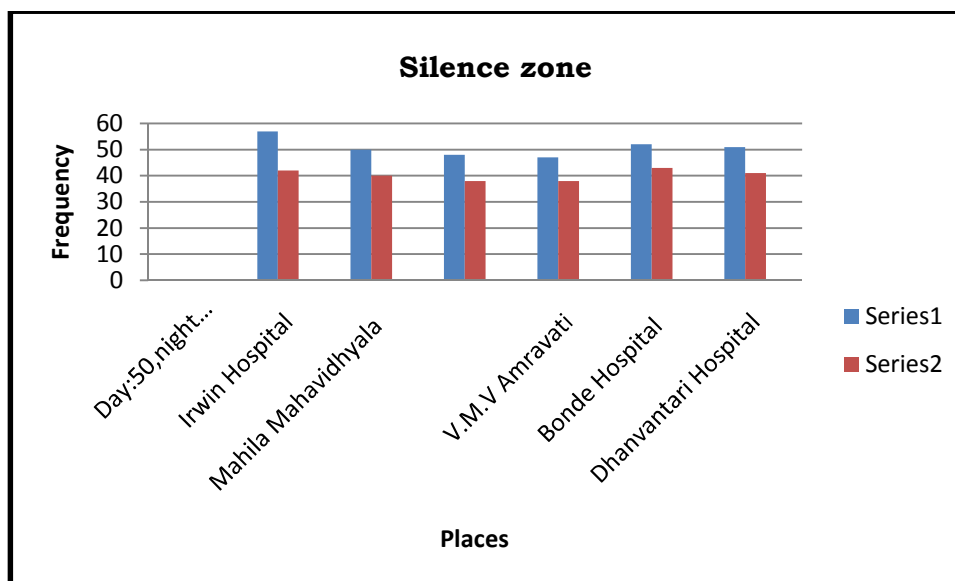


Fig 3.9: Ambient Noise Levels of the Silence Zone

D. Industrial zone (CPCB Standards:Day:75,night 70dB(A)Leq)				
31.	Krishna Tiles MIDC Amravati			62 48
32.	Yashoda Dairy. MIDC			54 41
33.	Nandgon Industrial area			59 46
	Minimum	Maximum	Average	
Day	54	62	58.33	
Night	41	48	45	

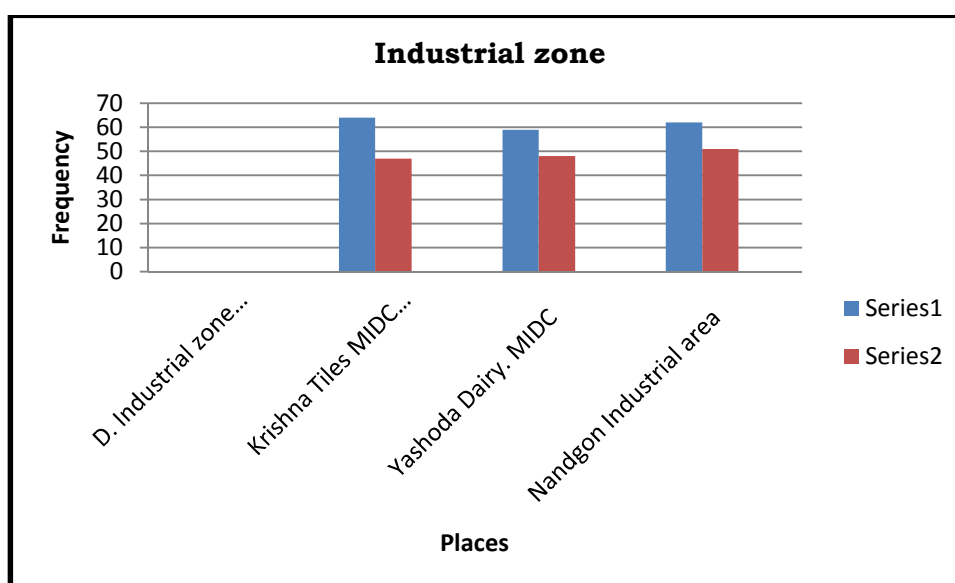


fig 3.10 : Ambient Noise Levels of the Industrial zone

Table 3.3.2

Noise Levels during Ganesh Festival

Sr. No.	Sampling Location	Day Time Leq. dB(A)	Night Time Leq. dB(A)
1.	Ambadevi Area	75	49
2.	Gadge Nagar	64	46
3.	Amravati Railway Station Area	68	45
4.	Rukmuni Nagar	52	44
5.	Chaprasi Pura	45	41
6.	Budhwara	65	47
	Minimum	Maximum	Average
Day	45	75	61.50
Night	41	49	45.33

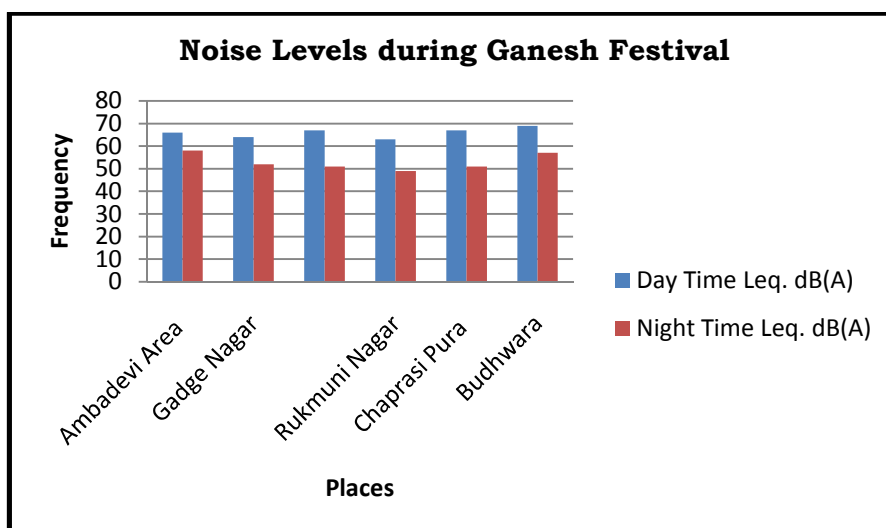


Fig.3.11: Noise Levels during Ganesh Festival

Table 3.3.3
Noise Levels during Durga Festival

Sr. No.	Sampling Location	Day Time Leq. dB(A)	Night Time Leq. dB(A)
1	Ambadevi Area	74	53
2	Raj kamal Square	62	51
3	Dastur Nagar	46	48
4	Sant Dnyaneshwar Sabhagruh	52	47
	Minimum	Maximum	Average
Day	46	74	58.50
Night	47	53	49.75

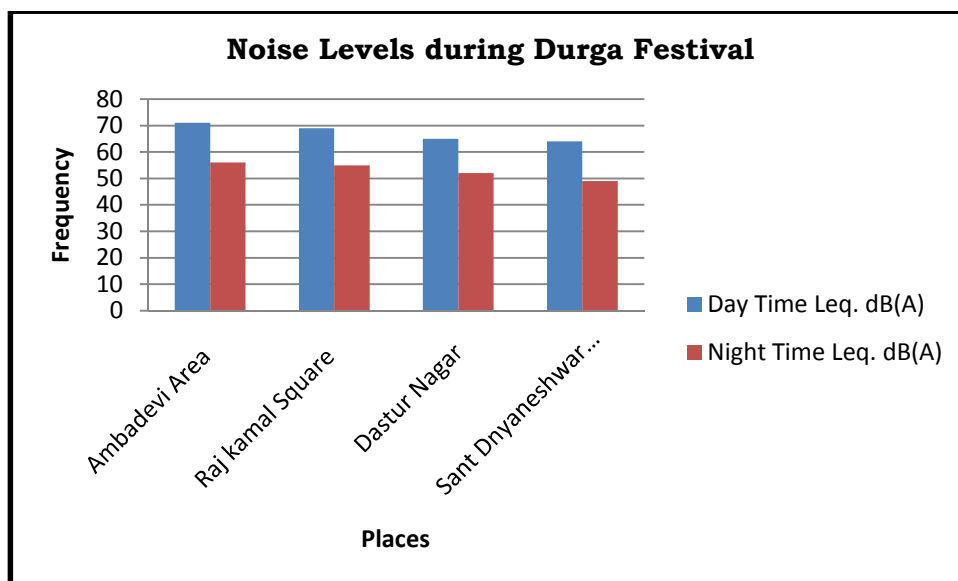


Fig.3.12: Noise Levels during Durga Festival

Table 3.3.4

NOISE POLLUTION LEVEL IN AMRAVATI CITY

Sr.No.	Zone	Noise Level Limit dB (A) Leq	
		Day Time	Night Time
1	Industrial Zone (75 / 70) dB (A)	54 to 62	41 to 48
2	Commercial Zone (65 / 55) dB (A)	66 to 75	43 to 49
3	Residential Zone (55 / 45) dB (A)	45 to 52	40 to 45
4	Silent Zone (50 / 40) dB (A)	60 to 66	49 to 53

Graphical Representation of Noise level Data

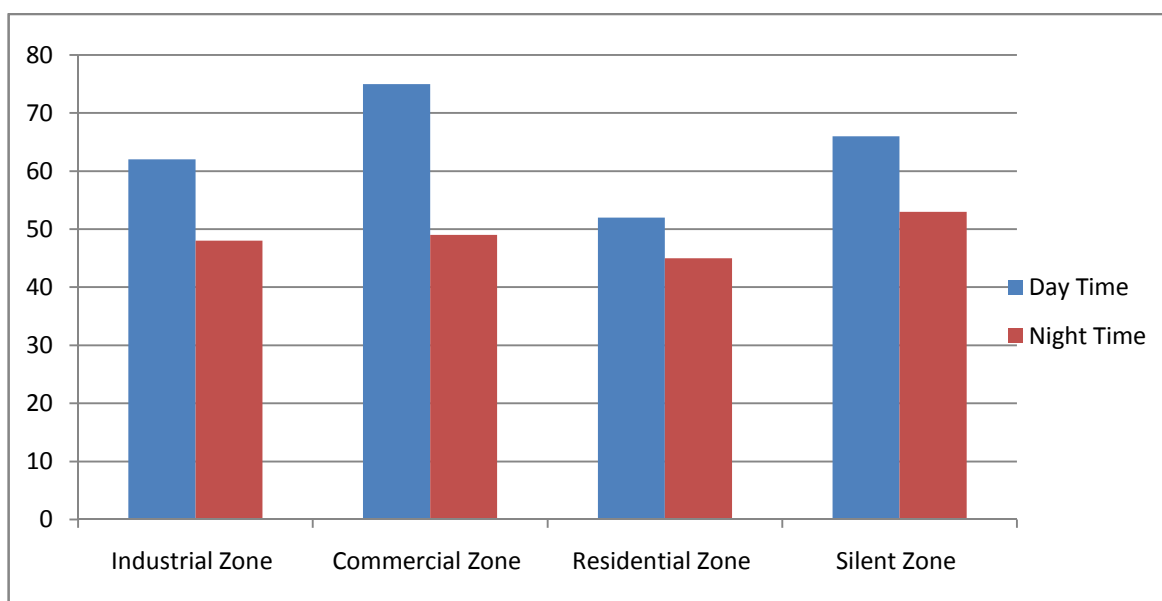


Fig.3.13

3.4 Water Environment

3.4.1 Water Supply

As per DPSIR, 'Sources of drinking water' indicator is used. This indicator has no unified objective and it differs from city to city. The sources of drinking water indicate exploitation of local aquifers and as well the quality of the drinking water that can influence human health. In some cases, water can be imported that shows dependence on different sources.

Population as per 2011 census	6.47 lakhs
Total Water Demand	For-2015 : 113 MLD For-2029 : 151 MLD For 2051 : 200 MLD
Total Connections	Private: 85,000 General- 1200
Pipe Line	950 km
Storage	Open Land- 3 Storage Tank- 13
Avg. per capita/day Supply	135 lit per capita / day

3.4.2 Source: Amravati Water Supply Division

CHECK LIST FOR SUBMISSION AND SCRUTINY OF DPR (SEWARAGE SCHEME)		
Sr. No.	Description	Write "Yes" or "No" etc. in the column
		If yes, give page No. / DPR Volume reference. If No, reasons thereof
1	2	3
3	GENERAL COMPONENTS	
3.1	Name of the town/City/District/State for which scheme has been formulated with name of the scheme	
	a) Name of the City/Town	Amravati
	b) Name of the District	Amravati
	c) Name of the State	Maharashtra
	d) Name of the Scheme	Under Ground Sewerage Scheme for Amravati M.C. Area
3.2	The cost and date of approved by Apex Committee of Govt. of India as per SAAP	Rs. 391.00 Crores Date 08/07/2016
	1) Date of Approval	08/07/2016
	2) Cost as per approved SAAP	Rs. 391.00 Crores
	3) Estimated cost of DPR	Rs. 95.48 Crores
	4) Major comments/observations	
3.3	Whether the commitment to launch the scheme immediately after approval of the scheme is appended in DPR. (Whether administrative approval of state Government is obtained to implement the scheme immediately after approval of Govt. of India and enclosed in DPR)	Yes
3.4	a) Whether Project formulation justification (need for the project) has been furnished in DPR. Please justify the need of the project. Justification b) Whether executive summary of the project is furnished in the DPR.	Yes. Appended in DPR
3.5	Whether linkages of this scheme have been established with other ongoing water supply schemes being funded by the Central/State Govt./Other agencies, if any. Please furnish works in the ongoing projects.	Yes
3.6	Whether the map showing administrative and political jurisdiction of the project area has been given in the DPR. Area within Municipal limit Sq. Km. : 121.65 Extent of area considered in the DPR. Sq. Km. : 40.14 Sq Km Additional area (beyond Municipal limit) considered in the DPR Nil	
3.7	Whether the land use pattern of the city/town/project area as per the approved Master Plan has been given in DPR	Yes
	b) No. of house hold with service connection	839
	c) No. of house hold without service connection	24646
	d) Whether zone wise detail are attached.	Yes
4	ENGINEERING COMPONENTS	

4.1	<p>Please furnish the details of city/project area,</p> <p>a) Area of town/city (municipal limit):</p> <p>b) Extent of the project area are considered in the DPR:</p> <p>c) Additional area (beyond municipal limit) considered in the DPR:</p> <p>d) No. of households (as per 2001 and 2011 census)</p> <p>A) City population. As per 2001 census: As per 2011 census: Initial stage (year 2018) population (if any) nil Lakh (Year in which Project is likely to be commissioned) Intermediate stage (year 2033) population (if any) nil Lakh Ultimate stage (year 2048) population (if any) nil Lakh</p>	<p>121.65 Sq.km. 40.14 Sq. Km. Nil 136796 No.</p> <p>549434 souls 647057 souls 722416 souls</p> <p>883971 souls 1045621 souls</p>
	<p>Population growth rate adopted 28% year (based on the past 4 decadal growth rate)</p> <p>Whether population forecasted, their methods and justification are attached. Whether any certificate for floating/tourist population has been obtained from tourist department and furnished in the DPR. please justify.</p> <p>B) Whether the population project has been made in consonance with the Development Master Plan</p> <p>C) Project area (party of the City)</p> <p>Initial Stage (year 2018) : Intermediate Stage (year 2033): Ultimate Stage (year 2048) : Population growth rate adopted 28% year (based on the past 4 decadal growth rate) & as per DPR of AMRUT water supply scheme</p>	<p>722416 souls 883971 souls 1045621 souls</p>
	d) Zone wise population (separately)..... (On Shet No.2)	Yes
4.2	Whether existing details of water supply / Sewerage for urba/urban agglomeration has been furnished in DPR. Please furnish the details.	
	a) Name of the sources and No. of locations	Uppar Wardha Dam
	b) Ground water: MLD (Total waste water generated)	80% of water supply + infiltration
	e) Existing capacity of WTP and Nos.	@ 120 LPCD (Average flow 125.50 mld peak flow (266.38 mld)
	f) Capacity Utilization (with overloading)	
	g) No. of tubewells and total abstraction and yield of each tube well: NIL (Nos) ----- MLD ---- ---- Ipm (range) No. of borewells / tube wells (operational / inoperational) : NIL Nos.	
	h) Total supply in the town/city (capacity of WTP/Tubewell separately Surface Water Ground Water NIL MLD	
	i) Total water supply in town (residential/commercial/institutions):	
	j) Total supply to the industries : NIL MLD	
	Zones % coverage	
		Zone - I - SRPF nalla
		Zone - II - Gadgenagar Nalla
		Zone - III - Navsari nalla

		Zone - IV - Tope Nagar Nalla
		Zone - V - Amba Nalla
		Zone - VI - Rahatgaon Nalla
		Zone - VII - Akoli Nalla
		Zone - VIII - Gopal Nagar nalla
		Zone - IX - Staton nalla
		Zone - X - Kondeshwar nalla
	n) Average per capita water supply level / Sewage contribution (existing) in city:	
	o) Average per capita water supply level (existing in the project : 135 lpcd	120 LPCD
	p) Whether statement showing details of lpcd calculation (Gross and Net) are appended in DPR.	Yes
	q) Existing UfW: (Please specify and study was conducted) reduced leakages & public stand post. Tried to reduce unauthorised connections.	
	r) Existing No. of House services connections: (Sewage)	839
	b) Gross waste water demand (city / town)	
	waste water Initial Stage (2018)	Av. Flow Peak flow
	generation Intermediate stage	87.15 mld 188.80 mld
	(2033) Ultimate stage	106.10 mld 227.80 mld
	(2048)	
	c) Demand of commercial. If any	125.50 mld 266.38 mld
	k) Net water demand - city / town	Av. Flow Peak flow
	Initial Stage	87.15 mld 188.80 mld
	(2018)	
	Intermediate	106.10 mld 227.80 mld
	stage (2033)	
	Ultimate stage	125.50 mld 266.38 mld
	(2048)	
	l) Whether zone wise waste water demand statement is enclosed	Yes
4.4	Whether the existing water supply / contribution waste water infrastructure has been taken into consideration in DPR. Please furnish the details of various components of the existing system.	Yes
	l) Pumping Station and STP	
	a) Design capacity of pumping station (year of construction) : ----- MLD	20 min detention period Cap 6.50 lakh lit
	b) Design capacity of (year of construction) : STP (2025)	30.5 + 44.00 = 74.50 mld
	c) Quantity of water treated ----- MLD	2.00 mld
	f) Total (c & e) ----- MLD	125.50 mld
	g) Shortfall in capacity ----- MLD	51.00 mld
	II) Pumping main (Raw and Clear Water)	
	Size and length of material ----- mm (----- km) (GI/PVC/AC/PSC/MS/DI etc.)	Nil
	III)	
	a) Total No. of service reservoir and capacity year of construction of each	Not applicable
	b) Height of service reservoir (Please specify No.s and capacity and age)	
	c) Justification for upgradation, if any	
	IV) Pumping Machinery (Raw and Clear water) for Existing STP	for 30.50 mld STP 100 HP 6 nos
	a) Type of pumps	

	b) Discharge Head ----- HP -----	for 30.50 mld STP 100 HP 6 nos
	d) Justification for replacement, if any	for 44.00 mld STP 200 HP 3 Nos., 125 HP 2 Nos
	V) Distribution System	
	a) Total length of road of City / Town: -----km (zone 1 to 10)	960 Kms
	b) Total length of road in Project area: -----km (zone 4 & 5)	506 Kms
	c) Type of roads and their length: -----km	20% WBM 60% Tar 20% Concrete
	d) Total length of sewage collection system in the project area : ----- km	Not proposed in this DPR
	e) Total length of sewage collection system (zone 4&5) in the project area -----km	294 Kms
	f) Material and age of the existing pipe (GI/PVC/AC/PSC/MS/DI/HDPE etc. ----- km)	R.C.C. NP II, III, IV
	g) Size and length of material of existing pipes (sizewise: -----mm (dia) ----- km. (length)	200 mm & 180 mm R.C.C. NP II, III, IV
	h) Pipe length to be retained in the system : ----- km	
	i) Pipe length to be replaced (to be discarded from the existing system) (with reason)	
	VII) Details of Meters (dia wise retail meters details)	Zone II Zone III Zone IV Zone V
	1) Apartment	125 16 99 476
	2) Banglow	6416 4126 18714 38458
	3) Hospitals	13 7 47 100
	4) Govt. offices	35 6 18 26
	5) Schools	102 19 140 217
	6) Hotels	112 247 2562 2744
	7) Slum	593 641 4002 5916
	8) Industry	3 2 103 84
	9) other	345 338 4098 3937
	Total	7794 5382 28783 51952
4.5	Please furnishing the proposed major components and component - wise estimated cost (AMRUT PHASE I)	Attached separately
4.6	Whether the design of (AMRUT PHASE I) infrastructure has been provided in DPR. Please furnish the details.	Yes
	I) Pumping station TM STP sewage collection system of Sewerage	
	a) Design period (30 years as per CPHEEO Manual): ----- year	Existing pumping station
	II) STP	Existing STP
	b) Capacity of STP	Existing : 30.50 -MLD Existing :-44.00 MLD
	a) Shortfall in capacity, if any, ot meet the intermediate demand: -----MLD	No
	c) Whether life - cycle cost assessment of treatment technologies has been furnished:	Activated sludge process

c) Whether a detailed note on performance of existing WTP (in considered in the proposal) has been furnished	yes (statement attached)
d) Whether temperature, elevation and location of the town has been taken into account while designing the process of the STP, whether required and furnished	yes , the proposal is for utilized the existing treatment facilities
e) Whether reasons for inadequate performance of existing STP (If considered in the proposal) Have been furnished	Yes
f) Whether provision has been made for sludge treatment facilities in STP	Yes
IV) Pumping main/rising mains and feeder main:	Existing R/m 700 MM & 900 mm DI is used for conveyance of sewages flow
Pumping Main/Rising Mains	Yes
a) Design period (30 years as per CPHEEO Manual) : ----- Year	Yes
b)i) Whether design of economic size of plumbing main has been done using computer Software for the purpose (no manual design should be enclosed)	Yes
ii) Whether water hammer is considered in design	Yes
iii) Whether design of pumping machinery is enclosed	not necessary existing R/m
c) Standby for pump sets (please specify 50% or 100%)	50%
d) Total No. of pumping / Rising mains	2 nos
e) Average flow considered in different pumping mains: -----MLD	
f) Availability of power supply : -----Kwh	24 hrs
g) Pumping Hours considered (20 to 22 hrs): 24 hrs	
h) Pumping efficiency considered (60 to 80%):--- -----%	70%
i) Capacity of pump set proposed for various pumping mains :----- HP	Yes
j) Whether genset/express feeder has been proposed :-----kva Please specify Nos. and capacity	Yes
k) Desing period (30 years as per) (Please Specify the actual) : 30 Year	30 yrs for Trunk main is considred
l) Whether design of economic size of pumping main has been done using computer software for the purpose (no manual design should be enclosed)	Yes
m) Standby for pump sets (please specify 50% or 100%)	50%
n) Total No. of feeder mains	
o) Average flow considered in different pumping mains:- ----- MLD	
P) Availability of power supply:- ----- kwh	
q) Pumping hours considered:- ----- Hrs.	
r) Pumping efficiency considered:- ----- %	
s) Capacity of pump sets proposed for various pumping mains	
t) Whether genset has been proposed (please specify Nos. and capacity):-	
V) Service Reservoirs	
a) Design period (15 years as per manual):- 15 years	Not Applicable
VI) Sewage collection system	Existing in zone 4 & 5
a) Design period (30 years as per CPHEEO Manual): 30 year	30

	b) Total length of road of city/town:-Km.	960 km
	c) Total length of road in the project area:-Km.	506 km
	d) Total length of distribution network: ----- km	294 km
	e) Total length of distribution network in the project area : ----- km	6284 Rmt
	f) Material of the proposed pipe:-	RCC NP II / III & IV
	K) 'C' Value of the proposed pipe material(100 to 145) as per manual: 135 ('N' value for sewer Desing - manning's constant)	Manning's Constant
	l) 'N' Value of existing pipe material and age of pipe 119 (20 years) for sewer desing (mannings constalu)	'n' value for RCC is taken 0.11 as per CPHEEO
	m) Residual head in distribution network (minimum residual head and range of available pressure (7m, 12m, 17m & 22m) (to be adopted as per manual depending on nature of town and its requiremnt) and justify the reasons 8m	Not Applicable
	n) Maximum velocity in distribution networkm/s (<3m/s)	
	o) Head loss considered in the design (m/s) m/km	
	p) Total no. of layouts (network)Nos./Nos.	
	r) Total length of distribution lines (Zone wise): Km.	
	s) Proposed pipe sizes:- 400 mm	
	t) Please flow from the outlet of service reservoirs as per the design (layout wise / DMS wise / zonewise) and total peak flow from all the service reservoirs..... (zonewise and MLD (TOTAL sewage flow contribution)	Given in statement form
	u) Whether hydraulic zone wise population and demand statement is enclosed individual zones	Given in statement form
	v) Whether the average flow from all the service reservoirs is matching the ultimate demand of the city/town/project area (please specify the total average outflow from all zones	Yes
	w) Whether the provision thrust blocks, anchor blocks, expansion joints, scour / drain valves air / vacuum releases valve and surge protection devices, wherever needed has been proposed	Yes
	x) Whether distribution system has been done based on convention approach	Yes
	y) Whether design details with input and outputs statement is attached in soft and hard copies	Yes
	aa) % of population coverage (including existing and proposed % (40.16 Sq. Km.)	33%
4.7	House service connection (please specify)	
	Existing	839 Nos.
	: -----Nos	
	Proposed	24646 Nos.
	:-----Nos	
4.8	whether the proposed scheme envisges supervisory control SCADA aggangemnt	No (This is gravity proposal)
4.9	Whether modular approach has been adopted to facilitate "addition" units to STP at a future date, whenever required.	Yes
4.10	Whether computer aided desing (both design and simulation) for sewage treatment plant. pumping station, sewer has been furnished in	Yes

	DPR	
4.11	a) Whether the raw sewage characteristics of source have been tested by state Public Health Engineering Dept. / Pollution control Board MOEF authorised laboratory State Govt. authorised laboratory and furnish in DPR	Yes
	b) Whether waste water collected from consumers is tested and its latest report are attached in DPR	Yes
4.12	Whether treated effluent shall conform to the standard drinking water as per BIS : 10500 and its latest amendments?	Yes
4.13	Whether surge analysis using computer software for transmission main has been done and furnished in the DPR	This is granity proposal
4.14	a) Whether key plan of the scheme is enclosed	Yes
	b) Whether hydraulic flow diagram (HFD) with head loss calculation for WTP and layout plan of WTP with other components has been furnished in DPR	Existing STP layout plan attached
4.15	i) Whether maps of proposed sewage collection system indicating RL, Node no., link no., Available head etc. for all the zones (project area) are enclosed with the DPR existing pipe lines (scale 1:200) and alignment map.	Yes
	ii) Whether L section of internal of 150 m of the proposed pumping main / transmission main have been furnished in DPR (30 m in case of undulations)	Yes (L -section of Combine Trunk Main)
	iii) Whether detailed drawing of all structures considered in scheme are enclosed	Yes attached
4.16	Whether the site of the proposed STP has been located as per that earmarked in the Master plan of the town.	No STP, Existing STP are utilised
4.17	Whether the provision of the land for the land acquisition for the sewage treatment plant, service reservoirs water supply network, if any has been made as per 30 years requirement and future expansion in the DPR?	Land is not required for the works in this DPR
	d) Whether private land under acquisition and time required for acquisition.	
Hectars / Months	
	e) Status of action initiated for transfer of Govt. land and acquisition of private land please Specify	
4.18	Whether bill of quantity (BOQ) and cost estimates of individual components of sewage collection system prepared as per latest SOR and copy of latest Schedule of Rates (SOR) and proforma invoice have been annexed with DPR	Yes
	a) Schedule of Rates adopted is. (please specify the year)	2015-16
	b) in case of SOR adopted is old please specify the cost index	0% at Initial Stage
	c) Any price escalation proposed in cost estimates (no escalation shall be proposed in DPR)	7% 1st year 14% 2nd year
	d) Whether analysis of rate alongwith minimum required quotation has been worked out for all the items and appended with DPR	
	e) Whether Bill of Quantities of individual component has been furnished in DPR	Yes
	f) Whether lump - sum provision for any item	Yes

	has been proposed. Please specify the maximum amount supported by reasons and documents.	
4.19	Whether detailed drawing, estimation and detailed BOQ for ancillary works such as boundary wall / fencing, approach and internal road, external electrification, buildings, water supply and drainage, site development / landscape etc. has been provided in the DPR	Not Applicable
4.20	Whether provision for road restoration, if any has been made as per PWD/State PWD/Urban local body norms.	Roadre-instating provision is made
4.23	Whether traffic diversion/control management for public and workers' safety, arising out of construction phase of sewerage works have been furnished in DPR	Yes
4.24	Whether institutional and Financial status of project Executing Agency (PEA) has been reported in DPR	Yes
4.25	Whether operation and maintenance cost and revenue generation details (O & M Frame work - existing and proposed) has been furnished in DPR	
	a) Existing sewage tax/cost/charges (in Rs.)	
	Residential	Low income group 800/- years Medum Group 1200/- High Group 1800/-
	Commercial	
	Institutional	
	Industrial	
	b) Proposed sewage tax/cost/charges (in Rs.)	
	Residential	Low income group 800/- years Medum Group 1200/- years High Group 1800/- years
	Commercial	
	Institutional	
	Industrial	
	c) Annual O & M cost (Rs. In lakhs (Headwise)	
	i) Existing (last 5 years)	
	2009-2010	
	2011-2012	
	2012-2013	
	2013-2014	
	2014-2015	
	ii) Proposed (2015-16)	Rs. 531.60 Lakh/Year
	d) Annula assessment	
	i) Last 5 years	
	2009-2010	
	2011-2012	
	2012-2013	
	2013-2014	
	2014-2015	
	ii) Proposed (2015-16)	
	e) Annual Revenue (Rs. In lakhs)	
	i) Existing (last 5 years)	
	2011-2012	
	2012-2013	
	2013-2014	
	2014-2015	
	2016-2017	
	ii) Proposed (2017-18)	
4.26	Whether projcet implementation period of project has been furnished in DPR specify the implementation period 2 year	Yes
4.27	Whether service level benchmarking has been furnished in DPR, please furnished SLBs	Yes
	Indicators	

	Benchmark After implementation	
	Of proposed project Coverage of water 100% supply connection	
	Per Capita supply of water 135%	
	Extent of Non – Revenue water 20%	
	Extent of metering 100%	
	Quality of water supplied 100%	
	Cost of Recovery 100%	
	Efficiency in collection of 90%	
4.31	Whether all the hard copies of the DPR furnished alongwith soft copies	Yes
4.32	Period of completion of project	2 years

Water consumption' is a DPSIR indicator. Objective of this indicator is to harmonies water consumption with water resources. Consumption of water per person depends on the availability and price of water, climate and the uses to which water is customarily put by individuals (drinking, bathing, washing, and gardening). It is derived from the ratio of total annual water consumption for all domestic uses to total number of inhabitants connected to supply system.

To minimize the level of dissatisfaction of an urban population is the objective of 'percentage of household connections'-DPSIR indicator. The quality and reliability of local services are taken for granted in highly industrialized countries, but limited access to, or poor quality of, infrastructure services in developing countries can be major impediments to business productivity, and major sources of frustration to the population. It is expressed in percentage of households that are connected to piped water.

Quality of Drinking water is used as an indicator in DPSIR. The objective of this indicator is to reduce the percentage of measurements exceeding the recommended WHO guidelines. The microbiological and chemical quality of water is of prime importance to the health of human communities. It is extremely important to ensure that water supplies are free from pathogenic bacteria and not contaminated by sewage. The chemical parameters of water quality are nitrates, fluorine, benzene and chlordan. PCMC is following CPHEEO and IS standards which are compatible with WHO.

'Wastewater Treatment' is used as indicator in the DPSIR indicator system. The objective of this indicator is to reduce urban pollution by waste water. This indicator includes % of dwelling connected to sewage system and % of wastewater treated. The percentage of wastewater that is treated is a key indicator of the level of water quality management. A reliable wastewater

treatment system is a major indicator of the level of local development and of community.

Amravati Region is blessed with vast natural water resources in the form of Perennial River which are major source of drinking water supply to various cities. The important occupations in this region are agriculture, which are highly dependent on these important water resources. The industrialization and the increasing urbanization are responsible for the rapidly increasing stress on the water environment of the area. It is therefore necessary to protect these water resources of the region.

3.4.2 Surface Water

The important rivers flowing through the region are Wardha, Painganga, Purna, Katepurna, Man, Shahanoor, Chandrabhaga, Bembla & Nalganga etc.

These rivers are important drinking water resources of the region. MPC Board regularly monitors the water quality at these important water resources and the water quality is generally meeting the standards. Specified by the best uses in the particular stretches.

The Amba nala passes through the dense, residential, & commercial area of Amravati city. It is observed that these rivers are encroached by the residential growth from all sides & experiencing pollution due to addition of domestic sewage. Further, their natural water streams are also obstructed due to human activities resulting in drying of these rivers.

3.4.3 Ground Water

Groundwater in an urban area need not be used fully in potable water distribution system as every urban center provides water treatment and distribution system. Open wells, bore wells and tube wells are constructed in authorized as well as unauthorized layouts and slums, to cater to the local needs as some of the pipe network may not have reached there. Besides this, the recharge of groundwater in urban area elevates ground water level in peri-urban area and therefore even if surface water and treated water is available in abundance in urban centers, ground water resource needs to be protected for present as well as future generation.

Depth to Water Level

The depth to water in Pre-monsoon ranges from 15 m to 12 m and during Post - monsoon Season ranges from 8 to 10 m. The citizens of Amravati are dependent on ground water for carrying out various domestic, agricultural activities etc. Keeping this in views in future Rain Water Harvesting should be made mandatory for new buildings and institutions.

Best Practices adopted by Amravati Municipal Corporation:-**Rain Water Harvesting:-**

Rain is the ultimate source of fresh water. With the ground area around houses and buildings being cemented, particularly in cities and towns, rainwater, which runs off from terraces and roofs, was draining into low-lying areas and not percolating into the soil. Thereby, precious rainwater is squandered, as it is drained into the sea eventually.

Rain water harvesting is a system by which, the rainwater that collects on the roofs and the area around the buildings is directed into open wells through a filter tank or into a percolation chamber, built specifically for this purpose. Rainwater is collected directly or recharged into the ground to improve ground water storage. Water that is not extracted from ground during rainy days is the water saved.

Need for Rain-Water Harvesting

Major parts of our country have been facing continuous failure of monsoon and consequent deficit of rainfall over the last few years. Also, due to ever increasing population of India, the use of ground water has increased drastically leading to constant depletion of ground water level causing the wells and tube wells to dry up.

In some places, excessive heat waves during summer create a situation similar to drought. It is imperative to take adequate measures to meet the drinking water needs of the people in the country besides irrigation and domestic needs. Out of 8760 hours in a year, most of the rain in India falls in just 100 hours.

3.4.4 Methodology of Water Quality Assessment

Based on the reconnaissance, the type of water bodies and their relative importance with respect to the project site, water sampling locations were identified and samples were collected in summer (May-2016), Post-monsoon (November-2016) and winter (February-2017) seasons.

Sampling, preservation and transport of water samples from the field was done as per standard methods. Samples were analyzed for physico-chemical characteristics comprising physical, inorganic, organic, nutrient, demand heavy metals and bacteriological parameter viz., total and faecal coliforms which were also analyzed as per Standard Methods for Examination of Water and Wastewater (22nd edition, 2012) / IS 3025 (**Detailed Standard in Annexure-I**).

3.4.5 Water Quality Report of Amravati City

"Water" is a prime natural resource and is considered as a precious national asset. It is a major constituent of all living beings. Water is available in two basic forms i.e. Surface water and Ground water. Water is used for various purposes ranging from domestic, agricultural, industrial, & allied purposes. The water quality criteria have been prepared by taking into consideration various designated uses. In order to assess the quality of water, various government agencies are working at National and State levels. This report includes water quality data analysed in Amravati City under "Water Quality Assessment Authority".

Water is an odourless, tasteless, colourless liquid formed by a combination of hydrogen and oxygen; forms streams, lakes, and seas, and is a major constituent of all living matter. The part of the earth's surface covered with water such as rivers, lakes, ponds, reservoirs and oceans etc. are described as water bodies. Water is 'life'. It is one of the fundamental needs on the globe. Water is probably the only natural resource to touch all aspects of human civilization from agricultural and industrial development to cultural and religious values embedded in society. The total water amount on the earth is about 1.35 billion cubic kilometers. About 97.1 % has been locked into oceans as saltwater. Ice sheets and glaciers have arrested 2.1 %. Only 0.2 % is the fresh water present

on the earth, which can be used by human for variety of purposes. Remaining 0.6 % is in underground form. But unfortunately it has been getting polluted day by day due to different anthropogenic activities. So it is burning need, to conserve the water and prevent it from every type of pollution. There should be proper water quality investigation and management. This could be possible by continuous Water Quality Monitoring. Ground water has been the primary source of water supply for domestic, agricultural, and industrial uses in Maharashtra. It is the single largest and most readily available source of irrigation and more than 55% of the total area under irrigation depends on ground water sources. Nearly 70% of rural water supplies are based on ground water. Thus ground water plays a very important role in the state's economy and therefore needs to be monitored scientifically both in terms of quality and quantity, for sustainable development and management.

In Maharashtra, water quality is monitored by various agencies namely Hydrology Project (SW), Groundwater Surveys & Development Agency (GSDA), Central Pollution Control Board (CPCB) through Maharashtra Pollution Control Board (MPCB), Central Water Commission (CWC), Central Ground Water Board (CGWB, NHNS) as per provisions made by "Water Quality Assessment Authority" constituted under sub sections (1) and (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986)

Sampling Sites

Station I – Gadge Nagar (Public Well)

Station II – Rajapeth (Bore well)

Station III – MIDC Area Bypass (Bore Well)

Station IV –Itwara (Tap Water)

Station V –Wadali Lake (Surface water)

Station VI –Chattri Lake (Surface Water)

3.4.5.1 Results

The pH of collected water sample ranged between 7.2-7.8 indicating neutral to slightly alkaline. The conductivity and turbidity of water samples varies between 523 to 965 $\mu\text{S}/\text{cm}$ and 17 to 35.37 NTU respectively. The TDS, total hardness, and total alkalinity were found to be in the range as 423 to 809 mg/l, 174 to 511 mg/l and 184 to 345 mg/l respectively. Nutrient concentration in the form of

total phosphate and nitrate was found to be in the range of 0.33 to 0.48 mg/l and 0.09 to 1.54 mg/l which were well below the stipulated standard. The COD values in the Station IV,V &VI were found to be 17, 37 & 48 mg/l resp. and. The BOD values in the Station V &VI were found to be 8 & 18 mg/l respectively well within the stipulated standard.

Table 3.4.1
Physico-chemical Characteristics of Amravati

Parameters	Station I	Station II	Station III	Station IV	Station V	Station VI
W.T °C	25	24	26	27	25	26
pH	7.9	7.5	7.4	6.9	7.6	8.1
Conductivity uc/cm	994	758	707	676	591	729
Turbidity	21.05	21.02	23.91	18.4	38.42	36.52
D.O	6.1	5.6	5.4	7.1	6.6	7.1
CO ₂	7.95	5.8	5.12	4.32	2.95	0.41
T.D.S.	785	582	515	395	439	467
T.H.	596	337	238	367	318	407
P.A.	194	58	67	70	75	61
T.A	322	425	306	342	168	238
CaCO ₃	262	218	138	127	222	187
Ca	72	69	75	61	54	54
Mg	39	45	37	48	30	41
Cl	61	78	167	64	47	57
SO ₄	0.75	0.31	3.17	0.54	6.11	13.84
PO ₄	0.49	0.62	0.63	0.45	0.59	0.51
NO ₃	2.16	0.52	0.83	0.68	0.13	0.23
COD	--	--	--	66	81	58
BOD	--	--	--	--	15	30

* All the readings are in mg/lit except Temperature, pH, Conductivity and Turbidity

Abbreviations

D.O. – Dissolved Oxygen

T.D.S. – Total Dissolved Solids

T.H. – Total Hardness

P.A. – Phenolphthalein Alkalinity

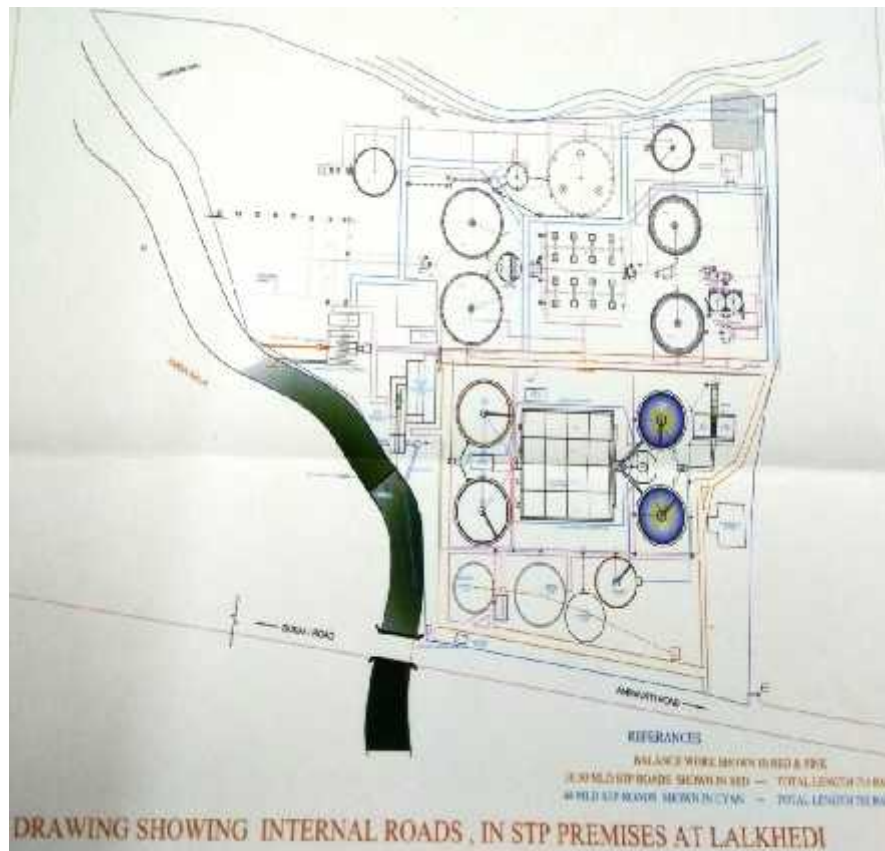
T.A. – Total Alkalinity

Ca – Calcium

3.4.6 Wastewater Management

Presently around 92 MLD of waste water generated by the city is discharged into two main waste water stream called Amba Nala and Dalelpuri Nala. These two stream flow through the network in the city and confluence at lalkhadi village in the peri urban area of Amravati city. Finally this waste water is discharged into the Pedhi River 15 km away from the city. The existing growth rate of the city demands more channels to carry the waste water generated by the increasing population. Assuming the rate of water supply as 120 lpcd and about 80% of the water withdrawal is supposed to be return as waste water to the nearby surface water bodies. Google map of the Amravati Sewage treatment plant given in **Plate 3.4.1**.



Plate 3.4.1 : Google Map View of AMC Sewage Treatment Plant**Drawing of STP Design at Lalkhedi (30.5 and 44 MLD)**

In waste water treatment plant at lalkhadi working staff number is 10 including both the technical and nontechnical staff.

No government and non government organization treats this huge quantity of waste water generated by the urban population. As this waste water is loaded by domestic waste, it becomes rich in nutrients and minerals with an exponential numbers of microorganisms. The exponential feature of waste water has drawn the attention of farmers having agricultural land in the vicinity of waste water stream. Above 100 -150 farms landholder facing the death of water have adopted the waste water irrigation.

Wastewater treatment is a process to convert waste water which is water no longer needed or suitable for its most recent use - into an effluent that can be either returned to the water cycle with minimal environmental issue or reused. The latter is called water reclamation and implies avoidance of disposal by use of

treated wastewater effluent for various purposes. Treatment means removing impurities from water being treated; and some methods of treatment are applicable to both water and wastewater. The physical infrastructure used for wastewater treatment is called a "wastewater treatment plant" (WTP).

The treatment of wastewater belongs to the overarching field of sanitation, with the management of human waste, solid waste, sewage treatment, storm water (drainage) management, and water treatment. By-products from wastewater treatment plants, such as screenings, grit and sewage sludge may also be treated in a wastewater treatment plant. If the wastewater is predominantly from municipal sources (households and small industries) it is called sewage and its treatment is called sewage treatment.

3.4.6 Processes Used

3.4.6.1 Phase Separation

Phase separation transfers impurities into a non-aqueous phase. Phase separation may occur at intermediate points in a treatment sequence to remove solids generated during oxidation or polishing. Grease and oil may be recovered for fuel or saponification. Solids often require dewatering of sludge in a waste water treatment. Disposal options for dried solids vary with the type and concentration of impurities removed from water.

Production of waste brine, however, may discourage wastewater treatment removing dissolved inorganic solids from water by methods like ion exchange, reverse osmosis, and distillation.

3.4.6.2 Sedimentation

Solid and non polar liquid may be removed from wastewater by gravity when density differences are sufficient to overcome dispersion by turbulence. Gravity Separation of solids is the primary treatment of sewage, where the unit process is called "primary settling tanks" or "primary sedimentation tanks". It is also widely used for the treatment of other wastewaters. Solids that are heavier than water will accumulate at the bottom of quiescent settling basins. More complex clarifiers also have skimmers to simultaneously remove floating grease like soap scum and solids like feathers or wood chips. Containers like the oil water separator are specifically designed to separate non-polar liquids.

3.4.6.3 Filtration

Colloidal suspensions of fine solids may be removed by filtration through fine physical barriers distinguished from coarser screens or sieves by the ability to remove particles smaller than the openings through which the water passes. Other types of water filters remove impurities by chemical or biological processes described below.

3.4.6.4 Oxidation

Oxidation reduces the biochemical oxidation demand of wastewater, and may reduce the toxicity of some impurities. Secondary treatment converts some impurities to carbon dioxide, water, and bio solids. Chemical oxidation is widely used for disinfection.

3.4.6.5 Chemical Oxidation

Chemical oxidation may remove some persistent organic chemicals and concentrations remaining after biochemical oxidation. Disinfection by chemical oxidation kills bacteria and microbial pathogens by adding ozone, chlorine or hypochlorite to wastewater.

3.4.6.6 Polishing

Polishing refers to treatments made following the above methods. These treatments may also be used independently for some industrial wastewater chemical reduction or pH adjustment minimizes chemical reactivity of wastewater following chemical oxidation. Carbon Filtering removes remaining contaminants and impurities by chemical absorption onto activated carbon.

Waste water Treatment Plant at lalkhadi Amravati running daily for 18 hours. Current Capacity of waste water treatment plant is 30.5 MLD. Daily 0.65 MLD of waste water treated per hours in the treatment plant. According with this daily waste water treated in waste water treatment plant is 11.7 MLD/Day. 44 MLD proposed and it is under construction. Additional 28 Cr. Funding is sanctioned by state govt. for completion of the project.

3.4.7 Disposal or Reuse

Although disposal or reuse occurs after treatment, it must be considered first. Since disposal or reuse is the objectives of wastewater treatment, disposal or reuse options are the basis for treatment decisions. Acceptable impurity concentrations may vary with the type of use or location of disposal. Transportation costs often make acceptable impurity concentrations dependent upon location of disposal, but expensive treatment requirements may encourage selection of a disposal location on the basis of impurity concentrations. Ocean disposal is subject to international treaty requirements. International treaties may also regulate disposal into rivers crossing international borders. Water bodies entirely within the jurisdiction of a single nation may be subject to regulations of multiple local governments. Acceptable impurity concentrations may vary widely among different jurisdictions for disposal of waste water to evaporation pond, infiltration basin, or injection well.

Amravati Municipal corporation in collaboration with CSIR-National Environmental Engineering Research Institute, Nagpur established ETP in Prashant nagar Garden based on Phytoremediation technology to purify the wastewater. It contains filtration screening along with Phytoremediation plantation as shown in **Plate 3.4.2.**

3.4.7 Task ahead Municipal Corporation

1. Establishment of good quality of management of solid waste and waste water at Amravati.
2. Improving quality of both solid waste and waste water.
3. Establishment of own offices at Amravati.
4. Commissioning of Common Treatment and Disposal facilities of solid waste and waste water.

5. Implementation of various rules at Municipal Corporation Amravati.
6. Improving collection practices of both solid waste and waste water.
7. Improving management techniques of solid waste and waste water.

3.7 Solid Waste Management

Solid waste management is a worldwide phenomenon. It is a big challenge all over the world for human beings. Therefore, the present study was undertaken to find out the problems and prospects of Municipal solid waste in Amravati City. Amravati city has a Present population no. is around 7, 23, 000 lakhs. The details about the solid waste management project and daily waste management Practices is attached with Annexure.

3.7.1 Present Practice of Solid Waste Management

The proper collection and disposal of Solid waste without causing any harm to the environment is collectively termed as the solid waste management.

The management of solid waste involves four steps. These are:

1. Generation and Composition of Waste
2. Collection of Waste
3. Transportation of Waste
4. Disposal of Waste

3.7.2 Generation of Waste

In Amravati, there are 5 zones within which 43 Prabhags are located. For sake of convenience of management of municipal solid waste, the waste generated, resources available etc. are referred to each prabhag and respective zonal office. The corporation performs its function as per the provisions of the act governing the municipal corporation in the state. It is based on the assumption that 260 gram per person per day of MSW generation. The **Table 3.7.1** below depicts the zone wise population and respective standard waste generation in 250-300

tonnes per day. These values are further confirmed with AMC department and annual report on implementation of MSW (management & handling) rules, 2000 for the State of Maharashtra (2012-13).

Table 3.7.1
Zone Wise Population and Total Solid Waste Generated

Zone Number	Zone Name	Population at Zones	Standard Waste Generation (TPD)	Actual Waste Generation (TPD)
Zone 1	Rampuri Camp	151141	36.27	48.27
Zone 2	Amravati AMC Main Campus	125598	30.14	37.14
Zone 3	Hamalpura	100621	24.14	33.14
Zone 4	Badnera	161925	38.86	46.86
Zone 5	Bhajibazar	109516	26.28	34.28
Total			155.26	200

3.7.3 Composition of Waste

A typical Solid waste comprises of biodegradable, non biodegradable and debris matter as given in **Table 3.7.2a, b and c** for Amravati city. The laboratory analysis of waste encompasses both physical and chemical characteristics and is given below. The physical characteristics of the MSW are depicted below and the chemical characteristics of MSW are depicted in below.

Table 3.7.2a
Solid Waste Generation

Sources of Solid Waste Generation	Quantity in Percentage
Slaughter House	6 %
House Hold	36%
Shops	17%
Hotels	16%
Industries	2%
Hospitals	17%
Temples	6%

Table 3.7.2b
Classification of Waste

Sr. No.	Type of waste	%Ton
1	Biodegradable	35.53
2	Recyclable	15.94
3	Debris and Silt	48.2

Table 3.7.2 c
Physical Characteristics of MSW

Sr. No.	Parameters	Value in %
1	Fruits/ Vegetables	44.65
2	Paper	9.96
3	Plastic	9.00
4	Cloths	5.32
5	Wood	6.62
6	Metals	0.12
7	Glass	0.36
8	Leather	0.17
9	Rag	0.05
10	Rubber	0.06
11	Fine Sand	26.24
12	Ash And Fine Earth	21.28
13	Moisture	7.66
14	Pebbles	13.82
15	Density	440kg/cu

3.7.4 Collection of Waste from Various Places

The Collection of Waste from Various Places Daily Given In **Table 3.7.3**. In addition to the above scheme of waste collection, there is provision of door-to-door collection of waste from approximately 138,000 nos. of houses weighing approx 250 MT. The provision of additional handcarts is envisaged for collection of waste from house to house. Segregation of waste which important for SWM is not carried out by AMC.

Table 3.7.3
Physical Characteristics of MSW

Place from where waste is actually collected	Resources of Special waste collection	Expenditure for Total waste collection/ Income	Remarks on Measure taken
Hotel: 156 Beer Bar:70 Slaughter House:2 Community Hall: 35 Vegetable Market:5 No of container place in the city 500nos i.e. is257 in good condition and 243in bad condition	Expenditure on transportation of total waste: Rs. 1.80cr Basically divided as per category Hotel & BEER Bar waste-1500/month Community Hall:1000/month Vegetable Market-600/trip	Contract given for the waste collection of waste from hotels, community halls, and beer bars etc. AMC is 7.2% royalty from the contractor per year	Provision for collection of waste exists through handcart 11dumper placers and 8 open truck

3.7.5 Transportation and Disposal of Waste

At present there is no technique of decentralized method of disposal of solid waste. The penalty is imposed on violation of rules from time to time. The transportation of waste up to compost depot at Sukali road is done through open trucks and dumper placer is done, but not through decentralized technique. The total length of roads is approx 1000 kms out of which 321kms of tar roads and 50kms of cement road is swept on daily basis. About 30 nos of penguin shaped

bins and 40 nos. of litterbins have been provided for collection of waste generated by pedestrians. There is little bit improvement in the decentralized technique of waste disposal and secondary transportation the job being allocated to an agency.

- The above activity i.e., collection and transportation of MSW is carried out both by contract basis and AMC itself. The total manpower bifurcated into the contractual labour and A.M.C manpower is: A.M.C employees – 799
- Contractual Labours – 1198.

The infrastructure deployed for the collection and transportation of MSW represented in **Table 3.7.4**:

Table 3.7.4
Facility for collection and transportation of MSW

Sr. No.	Particulars of Infrastructure	No.
1	Handcarts	90
2	GantiKatla(mechanized)	350
3	GantiKatla (ordinary)	90
4	Hydraulic Auto	133
5	M.O.H	1
6	Medical officer	1
7	Doctor Incharge	1
8	Sanitary Superintendent	1
9	Senior Sanitary Inspector	5
10	Sanitary inspector	43
11	Mukadam deployed	81

The total no of containers zone-wise is presented in **Table 3.7.5**. According to study (about 35%) are present in Rampuri Camp –1 while the most number of Ring type containers (about 37%) are present in Rampuri Camp –I. The most number of Open places where dumping is practiced is in Hamlapura (About 42%). The existing workforce and implements zone-wise is presented in Table 8

and the present disposal site is located at Sukli road, which has area of 27 acres and is located at 7 kms from the city.

Table 3.7.5
Total Number of Containers Zone Wise

Sr.No.	Zone	Dumper	Ring Type	Open Place
1	Rampuri Camp	166	52	28
2	AMC Main Office Premises	94	21	24
3	Hamalpura	137	22	53
4	Badnera	86	40	21
Management of Solid Waste at Landfill Site				

The disposal of solid waste is done at the landfill site, which is approx. 160- 170 MT/d. The waste is dumped at compost depot and processing is done. The provision of generating biogas from waste and generating electricity from waste is proposed. The segregation of wet and dry waste is not carried out at the site and contract has been allotted for generation of manure and electricity. In addition to waste management at landfill site, the landfill site itself needs management as there is no provision of plantation, fencing, water and electricity and the provision of the same is suggested in the 12th Finance Commission

3.7.6 Management of Solid Waste at Landfill Site

The disposal of solid waste is done at the landfill site, which is approx 160- 170 MT/d (**Plate 3.7.1**). The waste is dumped at compost depot and processing is done. The provision of generating biogas from waste and generating electricity from waste is proposed. The segregation of wet and dry waste is not carried out at the site and contract has been allotted for generation of manure and electricity.

In addition to waste management at landfill site, the landfill site itself needs management as there is no provision of plantation, fencing, water and electricity and the provision of the same is suggested in the 13th Finance Commission

&14th Finance Commission A.M.C. has called Expression Of Interest (EOI) to develop disposal facility of plastic waste at Sukali depot.



Plate 3.7.1: Solid Waste Landfill

3.7.7 Quality of Compost and Landfill Depot Soil

Qualities of compost and landfill depot soil at have been studied with respect to important physicochemical parameters such as pH, temperature, organic carbon, chlorides, Na, K, etc. In this paper revealed that the pH (7.76) of waste soil at temperature 32.4 °C. The colour of waste soil grayish dark brown and its texture sandy was determined. The moisture content (3.93 %) it much lower than control soil (6.62%), organic carbon (43.17%), Chloride (49.7 mg/kg), Conductivity ($1.792 \times 10^6 \mu\text{mho/m}$), sodium (26.5 mg/kg), potassium (89 mg/kg), CaCO_3 (79.1 %) respectively. The parameters examined values increases 30-60% folds more as compared to the control. Heavy metal analysis of waste soil, it contained Cu (1.001 mg/g), Zn (5.058 mg/g), Cr (0.536 mg/g), Ni (0.053 mg/g), Fe (21.65 mg/g), Mn (5.982 mg/g), Co (-100 mg/g) these all metal concentrations increases 4-7 times as compared to control soil. If this municipal solid waste landfill continues, it may create serious environmental problems.

(Details of Solid Waste Management enclosed separately)

3.7.8 Enforcement of MSW Rules 2016

The total revenue generation from imposition of penalties alone amounts to Rs 3 lakh per annum. The details of description of the offence and penalties thereby imposed based on the type of penalty is given in **Table 3.7.6**.

Table 3.7.6
Penalties Imposed on the Type of Offence

Sr. No.	Description of offence	Penalty amount
1	Relieving oneself in public place	Rs 20/-
2	Throwing waste on roads	Rs 50/-
3	Spitting and spreading waste on Govt. offices, public places and religious places	Rs 25/-
4	Disposal of hotel waste in public places or on road	Rs 200/-
5	Vendors spreading waste on public places	Rs 50/-
6	Hawkers related to vegetable and fruits spreading waste in public places.	Rs 50/-
7	All commercial establishment dumping waste in gutters, roads and public places	Rs 200/-
8	Cow dung etc on roads and public places	Rs 150/-
9	Dumping of industrial waste in public places	Rs 300/ -
10	Hospital clinical waste dumping on road, public places and open places	Rs 300/-
11	Construction debris dumping on road, public places and open places	Rs 500/-
12	Usage and Sale of Carry bags	Rs. 5000/-

3.7.9 Compliance of MSW Rules 2016

3.7.9.1 Prohibition of littering

For stopping littering A.M.C. has provided 500 closed containers and 120 fixed open spots.

3.7.9.2 Collection and Transportation of Waste

At present there are 120, 00000 i.e. 120 lakh households in Amravati city and approximately 90% (door to door collection) of the waste from the households are currently being collected but the practice of segregation at source is not being currently practiced by A.M.C. The work of transportation has been given on contract basis.

As per the general meeting no 126 dated 02/1/2017 and the standing committee meeting no 434 dated 29/12/2016 the board has pass the resolution that residential and commercial property should pay the service tax in all the Prabhags The service taxes imposed are as follow:-

Sr. No.	Establishment type	Service tax
1.	To segregate wet dry and hazardous waste collection from residential area	Nil
22	Wet waste generated from vegetable market	Nil

3.7.9.3 Processing of Biodegradable Waste

Vermiculture is being currently practiced on small scale at two places. There is no decentralized technique adopted by A.M.C.

3.7.9.4 Final disposal at Landfill Site

The waste is being currently dumped at the landfill site.

Site Information

The disposal of solid waste is done at Sukali, which is approx 10 KM from the Centre of the City i.e. Jaisthamb Square Amravati. **(Fig. 1.1).**



Fig. 3.7.1: Google Map View of Solid Waste Dumping Site

Existing Situation

In Amravati, Municipal Waste Management is practiced in a very unscientific manner and haphazard. Segregation of wastes to an extent is performed by the informal sector formed by rag pickers and Kabadiwallas. Rest of the waste is dumped in un-segregated manner.

Issue of Municipal Solid Waste

The disposal of solid waste through open dumping without any segregation according to an erratic way in Amravati city and it has been in practice even today. Due to regular dumping of solid wastes generated from the cities, it was observed during the last few decades that the random deposition approx i.e. 5-7 Lakh tonne. It proved to be detrimental by polluting the ground water through leaching effects, pollution of rivers through run off and living environment.

Current Situation

In order to put into practice an efficient, environmentally sound, and financially sustainable for Municipal Solid Waste Management System, which leads to significant improvements in cleanliness and hygienic conditions in the city, AMC has called for Request for Proposal RFP related to provide disposal and processing facility consultancy services. The services sought are to develop a MSW

management strategy and action plan for treatment and disposal of MSW to develop the suitable structures for implementing the project through Public Private Partnership on design, Build, Finance, operate and Transfer (DBFOT) basis. The resolution number **wide 368 dated 25-11-2016** has passed by the standing committee for the total 500 TPD plant proposed for the scientific disposal of the 200 TPD daily waste and 300 TPD for old dumping waste which was under Agreement process But this project put on hold due misconception Detailed Project Report and Request for Proposal procedure. Which result very poor performance in Swachh Bharat Survey by AMC and continuously effects adversely due to unscientific disposal at the dumping site. AMC should take initiative to resolve this issue.

3.7.9.5 Public Awareness Programs

The Corporation has taken various programmes to create awareness among the local people regarding the significance of the solid waste management, which includes the following steps: -

Pamphlets distribution.

Creating awareness through loudspeakers.

Door to door campaign.

Media publicity.

3.7.10 Sanitation Facilities

- 1) Financial outlay for provision of various sanitation facilities in budget for year 2017-2018= 24.60 crore

Amravati Municipal Corporation has various types of sanitation equipments which are as follows:

Name of Instrument	Quantity
Bobcat Machines	3
Fogging Machine	1
Fogging Machine small	10

Name of Instrument	Quantity
Spray Pump	100
Vacuum Emptier	3
Tractor	2
Water tanker	3
Compactor	2
Loader Tractor	2
JCB	1
Pole land	1
Truck Tripper	1
Hydraulic Auto	133
Ghanti Katla	356
Open trucks	18
Dumper placer	12

As per sanitation division in AMC out off 43 prabhag 1263 contractor worker and 861 permanent AMC employees working for solid waste management. Around 250 to 300 mt. solid waste generated from AMC to collect the waste

3.7.11 Biomedical Waste Management

As per the Bio-Medical Waste (Management and Handling) Rules, 1998 the collection and disposal of waste from Health Care Establishments is the liability of the proprietor.

There are 16 Municipal Corporation dispensaries and 12 Urban Health Post (UHP) existing in the Amravati city. 161 private hospitals and 4 Government hospitals in the city. Health care facilities in Amravati region is of about 11200 beds generating about 2237 kg of Bio-Medical Waste per day. The waste

generation is estimated based on rate of 0.125 kg/day/bed as per the estimates given by the common facility operators. As per the observations and report of six hospitals of Amravati city it is concluded that all the hospitals generating bio-medical waste. It includes hazardous waste in the form of solid and liquid. Not a single hospital from Amravati city has its own treatment and disposal mechanism.

The common bio-medical waste treatment and disposal plant established at Durgapur was established under the guidance of Global Eco Save System **Plate 3.7.2**. They collect biomedical waste from 4 districts. About 2000-3000 kg waste transported to the plant daily from all major hospitals from the region to the plant site. All the collected waste very first segregated according to the norms at the plant site. The plastic waste is transported for the recycling whereas, the human and sharpen waste were subjected to incineration. For the incineration there was separate department. Incineration was carried out at 800°C to 1150°C. The resultant ash latter dumped into the landfill area. The liquid waste generated was subjected for treatment. It was observed that the onsite workers related to segregation, incineration and dumping warred mask, gloves and apron. The plant authority carried out their monthly medical checkup which includes blood count, HIV test, and skin related tests.

The average waste generated per day in each studied hospitals were found to be 60 kg in District General Hospital, 95 kg in Dr. Panjabrao Deshmukh Medical College, 10 kg in Hi-Tech Multispecialty & Research Centre, 4 kg in Shri Krishna Hospital, 5 kg in Vidarbha Ayurved Mahavidyalaya, 16 kg in Navajivan Hospital respectively

The staff of the District General Hospital (Irvine) is trained to handle the waste but in private hospitals the staff is not aware about the training. The transport and disposal facilities of solid waste are not up to the mark even in government hospitals. For liquid waste there is no proper record about the quantity of waste generated and their discharging measures. There is neither attempt to minimize the quantity of waste generation nor any mechanism to decrease the toxicity of the waste. There is no any provision by the management to have any innovations, equipments in the future to treat the waste generation at the source level.

At the central disposal and management plant there is facility of accumulation and segregation particularly of solid waste through colored and labeled containers. There is no facility of collection and treatment of liquid waste. The plastic waste is also transported to the other stations for recycling. The staff of the central plant is not properly educated but the authority said that they are working through proper training program. Thus it is cleared that in Amravati city there is no any efficient management of hospital waste is in existence. The rules and regulations regarding to the bio-medical waste is not adequately followed. The government as well as private hospitals are not interested in proper management and disposal of their waste in accordance to the environmental rules. (et al; S.K. TIPPAT, AND A.U. PACHKHADE).



Plate 3.7.2: Biomedical Facility in Amravati City

Slaughter Houses

3.7.12.1 Slaughter House Waste

The basic facility for slaughtering and selling of meat is available in Amravati Municipal Corporation area. Under MC limits there are a total of four slaughter houses out of which two are for bigger animals whereas the remaining two are for smaller animals. All these slaughter houses are running under the control of veterinary doctors. The scheduled animals are checked by the veterinary doctors before slaughtering under Animal Preservation Act 1976.

The slaughter house for big animal at Kureshi Nagar is running since Municipal Council time. 8 to 9 animals are slaughtered here. As slaughter house at Walgaon Road is completed with the financial cooperation of Central Government. This project was sanctioned on the basis that 49.25 Lakh Municipal Corporation and 48.95 lakh from Central Government participation. Till now 47 lakh Rupees grant is received from central government for the management of solid waste generated from slaughter house. E.T.P., rendering plant, Sludge Drying Bed etc. is constructed as per M.P.C.B. norms. **(Plate 3.7.3)** The modernization of slaughter house is completed on the BoT basis by Fizz Expert Pvt. Ltd., Mumbai which is an excellent project in which 50 KLD ETP is constructed under the DPDC funding. M.P.C.B. has rejected consent to operate due to lack of some structures i.e. treated effluent holding tank, Network distribution system, plantations etc. maximum work has completed up to March 2016. Presently the said slaughter house is not in running condition due to some technical problems.



Plate 3.7.3: Slaughter House Amravati alongwith ETP

AMC has developed and successfully Organic Waste Converter and Plastic Waste Management Facility. The source of Information Waste Bin Solution, Nagpur.

3.7.13 Facility available for Solid Waste Process at Amravati Municipal Corporation

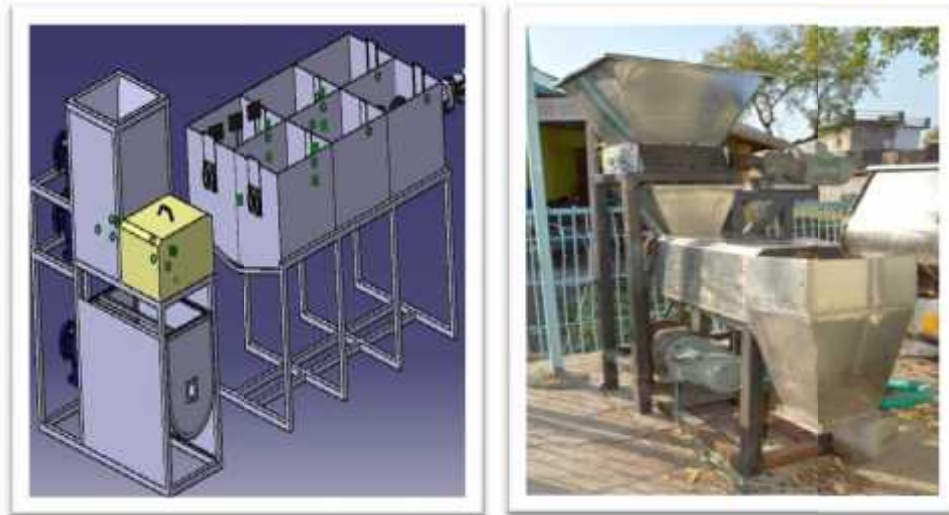
The salient features of the process technology are as given below:

- 2 MTP per day solid waste processing is installed at ITWARA bazar on 2 Oct 2016
- 2.5 MTP per day plastic waste recycling is installed at Sukli Depo on 29 Sep 2016

3.7.13.1 Organic Waste Management

The features of the process technology are as given below:

- Scientific treatment and conversion of organic solid waste from Vegetable/fruit market yards, eating houses, and housing societies in the vicinity of place of generation and as early as it is generated.
- The solid and liquid fractions of waste are separated initially by machine.
- The liquid stream is treated in absence of air to yield bio gas.
- The residual solid mass is chemically and bio chemically degraded to give micronutrient rich dry powder
- The process is mechanized to reduce requirement of Labour, time, thus overall cost.
- Scientific treatment and conversion of organic solid waste from Vegetable/fruit market yards, eating houses, and housing societies in the vicinity of place of generation and as early as it is generated.
- The solid and liquid fractions of waste are separated initially by machine.
- The liquid stream is treated in absence of air to yield bio gas.
- The residual solid mass is chemically and bio chemically degraded to give micronutrient rich dry powder.
- The process is mechanized to reduce requirement of labor, time, thus overall cost.



Drawing View OWC Machine

Actual OWC Machine Photograph

(Source Waste Bine Solution)

Product Analysis and Testing:

- Bio-gas – Combustible & burns with Blue flame in Bunsen / Gobar Gas Burner.
- Solid Residue – Tested for N, P, K, C and heavy metals like Zn, Cu, Cd, Hg, Fe PH, Moisture content
- The parameters are within acceptable limits of organic manure.
- The properties are comparable with other organic manure.

(i) Bio-Gas: It is a combustible low calorific value gas composed of 60-70 % methane, 20-25% of carbon di-oxide and 5-7% traces of other gases. We used for cooking purposes after cleaning. However it is not the primary aim to obtain the biogas from the process.

(ii) Manure: After the chemical and biological degradation of solid waste, the waste is converted into organic rich manure. The NPK values of this manure are compostable to the manure used for agricultural purpose.

3.7.13.2 Plastic Waste Management

Following steps are involved.

- The plastic waste is collected in bags or hopper from waste dumping yard.
- About 1 m³ (Weighing 40 to 50 kg) of plastic waste is put into the holding chamber of compaction / bale machine in two steps.
- The heating system is put on up to 5 minutes as required.

- The heating system is put off when plastics gets heated up to its softening Point (50 to 60°C)
- The hydraulic system is put on and compaction of heated plastics takes Place.
- The volume gets reduced by 85 to 90% say from 1m³
- The hydraulic cylinder is kept in place (compaction condition) and side doors opened. To 0.15m³.
- The wire is inserted to tie the compacted bundle mechanically too.
- The hydraulic cylinder is released and taken to initial position.
- The bale is taken out for storage. The plastics gets densities from 40 kg/m³ to 265 kg/m³



Actual Site Photograph of Plastic Waste Management

Advantages:

- The process is only for physical change of plastics from loose flying material to compact dandified bale, hence environmental friendly.
- The nuisances of flying plastics are overcome.
- Thermal and mechanical locking ensures compactness of bale during further transport.

- Further transportation cost is reduced to large extent.
- Value added dense plastic bale is produced from harmful nuisance causing municipal plastic waste.

Task ahead Municipal Corporation

Solid Waste Management is a vital, ongoing, and large public service system, which needs to be efficiently provided to the community to maintain aesthetic and public health standards. Municipal agencies will have to plan and execute the system in keeping with the increasing urban areas and population. Systematic effort in the improvement in various factors like institutional arrangement, financial provisions, appropriate technology, operations management, human resource development, public participation and awareness, and policy and legal framework for an integrated SWM system. To achieve Cleanliness, which is next to Godliness, it is necessary to design and operate an efficient SWM system. Public cooperation is essential for successful operation of such a system. It is observed that present facilities for management of solid waste for Amravati city are falling short to cope with increasing population and increased waste generation. The Municipal Solid Waste Management at Amravati city as managed by AMC needed to be improved by adopting various. For Amravati City, on site segregation activity of Solid waste to separate dry solid waste and wet solid waste should be improved to minimize the load on compost depot, Collection and Transportation facilities required to be strengthened by providing different category of extra collection vehicles as well as workers, existing compost depot and proposed Landfill site should be well planned and equipped with new technologies for disposal of municipal solid waste and thrust should be given on utilization of compost manure, recovery of possible materials for recycling, and landfill gas utilization for energy recovery.

1. Establishment of good quality of management of solid waste and waste water at Amravati.
2. Improving quality of both solid waste and waste water.
3. Establishment of own offices at Amravati.
4. Commissioning of Common Treatment and Disposal facilities of solid waste and waste water.
5. Implementation of various rules at Municipal Corporation Amravati.

6. Improving collection practices of both solid waste and waste water.
7. Improving management techniques of solid waste and waste water.

3.8 Traffic and Transportation Management

Amravati Vision to implement National Urban Transport Policy

To recognize that people occupy center stage in our cities and all plans would be for their common benefit and well being

Build Amravati cities the most inhabitable in the world and allow them to become the "engines of economic growth" that power India's development in the 21st century and towards the best smart city in India.

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, recreation and such other needs with our cities

Unusual transport modes have lots of pressures on the environment and ultimately on human health. Public transport saves valuable space and energy compared to private transport and has positive health benefits. The objective of DPSIR is to improve access to public transportation for all. The number of buses per lakh population is an important indicator for the adequacy of services in the city. The CIRT norms specify 40 buses per lakh population.

Traffic volumes are defined as number of vehicles (vehicles-km) and number of vehicles on main routes. This indicator measures the pressures on both physical and human environments in a city.

Present Road Transportation in Amravati

Amravati has a good road network but maintenance is unsatisfactory. Many of the roads are developed as a part of Integrated Road Development Project (IRDP). IRDP has revolutionized the roads in the city. Vehicle ownership is quite high; there are about 548693 lakhs registered vehicles in Amravati District till 31/03/2016. But the corresponding infrastructure in terms of parking facilities is highly inadequate. Also, the road conditions being are not up to the mark, the average travel speed is 30 km per hour making road safety a cause of concern. Considering the population and spread of the city, the public transportation system is inadequate, which is a cause of concern.

3.8.1 Public Transportation

Public transport in Amravati city is a road based bus, operated by AMC. Currently the city buses operated by AMC are privatized with the operation & maintenance done by the contractors. A royalty of 1.10 Paisa per Km is given to the AMC. A total of 27 buses run throughout the city covering a daily run of 3963 Kms. These buses run on eight routes. The frequency of these buses is 15 minutes i.e. after every 15 min the buses are available along these eight routes trying to cover the entire city. Although this seems to be quite less if compared with the present population of the city. The seating capacity of these 27 buses is given below:

Seating Capacity → 15 Buses = 30 Seater

12 Buses = 35 Seater

Apart from the city bus services ST bus service facilities is provided by the ST Mahamandal, Amravati. Currently the total no. of buses operating in the city is 70 covering a daily run of 27000 Km. Almost 23000 passengers avail the facility daily. Daily about 600 buses come into the city and same no i.e. 600 leaves the city. All the vehicles are PUC certified. There are two types of ST buses in operation. These are:

1. Ordinary Bus with capacity of 50 Seats
2. Semi Ordinary/Semi Luxury Bus with capacity of 39 Seats

Information regarding operational statistics of buses operated by the Maharashtra Road Transport Corporation is given in **Table 3.8.2** and depicted in **Plate 3.8.1**.

Table 3.8.2
Operational Statistics of Buses under M.S.R.T.C

Sr. No.	Item	Value
1	Total no of vehicles held at Depo	75Nos
2	Average no. of vehicles at Buses Arrival and Departure	800Nos
3	Average Diesel Consumption	6000LPD



Plate 3.8.1: Amravati Bus Stand

3.8.2 Parking Demand and Management

The numbers of registered vehicles are growing 7% per annum in Amravati. The rise in two wheelers / cars has led to an increase in demand for space for parking vehicles. Any vehicle that is registered requires a minimum of two places for parking. One at the origin - home and the other at the destination –work, shopping and institution. The traditional method of parking along the curb is insufficient. The parking of vehicles along the curb is uneconomical as it reduces the effective carriageway, causes an increase in congestion, accidents and pollution. The speed of moving vehicles is reduced by almost 65% due to curb parking. The road networks should be primarily dedicated for the purpose of public travel and any other use must be considered of secondary importance.

Unauthorized on-street parking due to lack of regulation and unavailability of off-street parking facilities are the main issues which needs to be addressed in the context of exponential growth of vehicles. There is an absence of a comprehensive parking policy for Amravati city, involving control and regulation of on-street parking, provision of off- parking faculties, intensive parking areas including air rights exploitation, levy of parking fee, parking norms and standards and demand management measures. Although AMC has reserved the space for parking facilities (**Plate 3.8.2 & 3.8.3**) but more efforts in this regard is required. The parking /no –parking zones needs to be well defined.



Plate 3.8.2: Parking Place for Two Wheelers in Panchawati



Plate 3.8.3 : Parking Space for Four Wheelers in AMC Area

The planning and development of a transportation network requires a well planned zoning ordinance in order to balance between the demand and supply of

parking space. The list of Parking Reservation I Developmental Plan is furnished in the **Table 3.8.3**. The zoning of parking is directly involved with the traffic operations and safety as it deals with the development density, setbacks and access. The Indian Road Congress (IRC) formulated the parking standards and zoning ordinance for the various land uses for Indian metropolitan cities. The IRC in its special publication IRC: SP: 12-1972 laid down the parking standards for different land uses activities for metropolitan cities of India. The zoning regulations and building bylaws, which prescribe parking norms and standards, have been formulated many years back when the motorization level was low. With the high intensity of ownership and use of motorized modes and their high growth, it is necessary to revise the parking norms and standards.

A number of strategies are recommended for managing the parking demand.

Important arterial roads, where acute shortage of capacity, on street should be banned.

Parking on footpaths, which is observed in Amravati, should be banned.

AMC should identify the selected roads where on street parking can be provided. These areas should be marked very clearly. Some of these facilities should be pay and park especially near commercial areas. It is suggested that a parking fee of Rs 2/- for two wheelers and Rs 5/- of cars for first two hours should be charged. Time frame is important because it will encourage short-term parking. It is also recommended to implement a differential parking fee policy with increasing fee structure in the central area and outer areas.

Suitable parking policy for the off-street parking facilities needs to be formulated based on costs of development, operation maintenance and management. Similar differential policy amongst parking sites in different zones needs to be adopted. Off-street parking facilities should be considered in PPP model.

Table 3.8.3

List of Parking Reservation as per Developmental Plan

Sr. No	Reservation Number	Type of Reservation	Mouza	Area (Hectare)
1	22	Parking/Rickshaw Stand	Navsari	0.5625
2	70	Parking	Tarkheda	0.13
3	71	Rickshaw/Cycle Stand	Tarkheda	0.02
4	82	Parking Rickshaw/Cycle Stand	Gambhirpur	0.54
5	111	Shop Center & Parking	Amravati	1.5
6	168 (C)	Parking	Amravati	0.035
7	199	Parking	Rajapeth	0.07
8	203	Rickshaw Stand	Rajapeth	0.157
9	204	Parking	Rajapeth	0.08
10	326 (A)	Parking	-	-
11	400	Parking	Gaothan	0.25
12	495	Parking	Gaothan	0.0325

3.8 Transportation and Fire and Safety Management

Amravati Vision to implement National Urban Transport Policy

To recognize that people occupy center stage in our cities and all plans would be for their common benefit and well being

Build Amravati cities the most inhabitable in the world and allow them to become the "engines of economic growth" that power India's development in the 21st century and towards the best smart city in India.

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, recreation and such other needs with our cities

Unusual transport modes have lots of pressures on the environment and ultimately on human health. Public transport saves valuable space and energy compared to private transport and has positive health benefits. The objective of DPSIR is to improve access to public transportation for all. The number of buses

per lakh population is an important indicator for the adequacy of services in the city. The CIRT norms specify 40 buses per lakh population.

Traffic volumes are defined as number of vehicles (vehicles-km) and number of vehicles on main routes. This indicator measures the pressures on both physical and human environments in a city.

Present Road Transportation in Amravati

Amravati has a good road network but maintenance is unsatisfactory. Many of the roads are developed as a part of Integrated Road Development Project (IRDP). IRDP has revolutionized the roads in the city. Vehicle ownership is quite high; there are about 548693 lakhs registered vehicles in Amravati District till 31/03/2016. But the corresponding infrastructure in terms of parking facilities is highly inadequate. Also, the road conditions being are not up to the mark, the average travel speed is 30 km per hour making road safety a cause of concern. Considering the population and spread of the city, the public transportation system is inadequate, which is a cause of concern.

3.8.1 Public Transportation

Public transport in Amravati city is a road based bus, operated by AMC. Currently the city buses operated by AMC are privatized with the operation & maintenance done by the contractors. A royalty of 1.10 Paisa per Km is given to the AMC. A total of 27 buses run throughout the city covering a daily run of 3963 Kms. These buses run on eight routes. The frequency of these buses is 15 minutes i.e. after every 15 min the buses are available along these eight routes trying to cover the entire city. Although this seems to be quite less if compared with the present population of the city. The seating capacity of these 27 buses is given below:

Seating Capacity → 15 Buses = 30 Seater 12 Buses = 35 Seater

Apart from the city bus services ST bus service facilities is provided by the ST Mahamandal, Amravati. Currently the total no. of buses operating in the city is 70 covering a daily run of 27000 Km. Almost 23000 passengers avail the facility daily. Daily about 600 buses comes into the city and same no i.e. 600 leaves the city. All the vehicles are PUC certified. There are two types of ST buses in operation. These are:

1. Ordinary Bus with capacity of 50 Seats
2. Semi Ordinary/Semi Luxury Bus with capacity of 39 Seats

Information regarding operational statistics of buses operated by the Maharashtra Road Transport Corporation is given in **Table 3.8.2** and depicted in **Plate 3.8.1**.

Table 3.8.2
Operational Statistics of Buses under M.S.R.T.C

Sr. No	Item	Value
1	Total no of vehicles held at Depo	75Nos
2	Average no. of vehicles at Buses Arrival and Departure	800Nos
3	Average Diesel Consumption	6000LPD

Parking Demand and Management

The numbers of registered vehicles are growing 7% per annum in Amravati. The rise in two wheelers / cars has led to an increase in demand for space for parking vehicles. Any vehicle that is registered requires a minimum of two places for parking. One at the origin - home and the other at the destination –work, shopping and institution. The traditional method of parking along the curb is insufficient. The parking of vehicles along the curb is uneconomical as it reduces the effective carriageway, causes an increase in congestion, accidents and pollution. The speed of moving vehicles is reduced by almost 65% due to curb parking. The road networks should be primarily dedicated for the purpose of public travel and any other use must be considered of secondary importance.

Unauthorized on-street parking due to lack of regulation and unavailability of off-street parking facilities are the main issues which needs to be addressed in the context of exponential growth of vehicles. There is an absence of a comprehensive parking policy for Amravati city, involving control and regulation of on-street parking, provision of off- parking faculties, intensive parking areas including air rights exploitation, levy of parking fee, parking norms and standards and demand management measures. Although AMC has reserved the space for parking facilities (**Plate 3.8.2 & 3.8.3**) but more efforts in this regard is required. The parking /no –parking zones needs to be well defined.

The planning and development of a transportation network requires a well planned zoning ordinance in order to balance between the demand and supply of parking space. The list of Parking Reservation I Developmental Plan is furnished in the **Table 3.8.3**. The zoning of parking is directly involved with the traffic operations and safety as it deals with the development density, setbacks and access. The Indian Road Congress (IRC) formulated the parking standards and zoning ordinance for the various land uses for Indian metropolitan cities. The IRC in its special publication IRC: SP: 12-1972 laid down the parking standards for different land uses activities for metropolitan cities of India. The zoning regulations and building bylaws, which prescribe parking norms and standards, have been formulated many years back when the motorization level was low. With the high intensity of ownership and use of motorized modes and their high growth, it is necessary to revise the parking norms and standards.

A number of strategies are recommended for managing the parking demand.

Important arterial roads, where acute shortage of capacity, on street should be banned.

Parking on footpaths, which is observed in Amravati, should be banned.

AMC should identify the selected roads where on street parking can be provided. These areas should be marked very clearly. Some of these facilities should be pay and park especially near commercial areas. It is suggested that a parking fee of Rs 2/- for two wheelers and Rs 5/- of cars for first two hours should be charged. Time frame is important because it will encourage short-term parking. It is also recommended to implement a differential parking fee policy with increasing fee structure in the central area and outer areas.

Suitable parking policy for the off-street parking facilities needs to be formulated based on costs of development, operation maintenance and management. Similar differential policy amongst parking sites in different zones needs to be adopted. Off-street parking facilities should be considered in PPP model.

Table 3.8.3

List of Parking Reservation as per Developmental Plan

Sr. No	Reservation Number	Type of Reservation	Mouza	Area (Hectare)
1	22	Parking/Rickshaw Stand	Navsari	0.5625
2	70	Parking	Tarkheda	0.13
3	71	Rickshaw/Cycle Stand	Tarkheda	0.02
4	82	Parking Rickshaw/Cycle Stand	Gambhirpur	0.54
5	111	Shop Center & Parking	Amravati	1.5
6	168 (C)	Parking	Amravati	0.035
7	199	Parking	Rajapeth	0.07
8	203	Rickshaw Stand	Rajapeth	0.157
9	204	Parking	Rajapeth	0.08
10	326 (A)	Parking	-	-
11	400	Parking	Gaothan	0.25
12	495	Parking	Gaothan	0.0325

The AMC Fire Brigade operates 1 fire station across the city and two new fire stations are under construction. The detail infrastructure available is attached to **annexure-VI**

Amravati Sustainable Capital city Development Project :-

Amravati Capital City Development Project consists of multiple projects in three phases over a plan period of 35 years. World Bank supported "Amravati Sustainable Capital City Development Project (ASCCDP)", is aimed at supporting specified components identified by APCRDA / Government of Andhra Pradesh, related to the initial and most critical infrastructure to help develop the city.

The Project Development objective for the proposed ASCCDP - " To build urban services of flood mitigation, sanitation and road connectivity for selected parts of Amravati Capital City as well as develop capacity of its public urban governance institutions" - reflects the objectives of the specific components being supported under this project by the bank.

Main components of ASCCDP are envisaged as - a) basic urban pro-poor infrastructure components b) Green / Climate resilient urban investment component and c) Technical assistance component.

Project Description:

The development objective of the Project is to build sustainable urban services and capacity of urban institutions for the development of Amravati Capital City.

The proposed key results indicators for the Project include:

- (i) the number of people (differentiated between male and female) that benefited from improved urban services;
- (ii) people and businesses having access to all season roads within a 500-meter range; and
- (iii) coverage of sanitation services (solid waste and wastewater). The results indicators will be finalized during Project appraisal.

Tree Plantation Movement

Tree Plantation is one of most ambitious initiatives of the Government of Maharashtra. With respect to this initiative Maharashtra Government had launched a massive drive to increase the green cover across the state. As a part of the initiative, the Maharashtra Government decided to plant around 2 crore trees across the state. Also, the state government also announced its plan to plant 50 crore saplings in the next three years.

No doubt this is one of the most novel and noblest deeds. Planting trees and taking care of them is not less than any social work. And that too in an era of unwanted and extreme cutting down of trees, this initiative is a great movement indeed. Moreover, what makes this initiative a massive action is the vision and the achievement of it. The target of 2,00,00,000 trees to be planted was fixed and it was seen that 2,81,38,634 number of trees were planted. This shows the enthusiasm and the vigour by which the Government worked on this initiative.

All the 36 districts of the state participated and contributed in the drive to make it a success. But it was the participation of volunteers who led this campaign to its peak with an aim to make Maharashtra covered in lush greenery. Initiatives of such kinds do not need much of monetary support, rather it requires people to volunteer and support such a cause. It requires people and their participation to plant the saplings and take an effort in planting them.

Contribution of AMRAVATI

Taking cognizance of the tree deficit in Amravati city, Amravati Municipal Corporation (AMC) to take up a tree plantation drive vigorously and instructed it to take its help in this work. Also AMC appealed to citizen take advantage of saplings that the department provides for plantation at a very nominal cost. He also suggested that AMC should take the help of NGOs working in the field of forest and environment conservation.

AMC had planted 16085 trees along the road side in the open spaces in year 2018-2019 among which AMC succeeded to conserve 10678 trees. In the year 2019-2020 AMC has planned for plantation of 20300 trees among which it is expected to keep maximum percentage of conservation.

4.0 Environmental Management Plan

The received amount from budget provision related to environmental concerned as mentioned below:

4.1 Solid Waste Management

According to DPR the utilization of fund for purchasing for containers tractor, trolley, mobile dust bean van, solid waste disposal facility and other materials.

4.2 Water Supply

- Water supply and sanitation management and expansion, preparation of audit report, individual connection monitoring of meters
- Open disinfection free sanitation
- Minimum 20% reutilization of wastewater

4.3 Basic Amenities Development

- Acquiring land according to action plan
- Construction of Hospitals and purchasing of its important instruments including Ambulance
- Development of Montessori, play grounds and shelter houses

4.4 What Step Should Amravati Municipal Corporation takes to minimize the Pollution in Amravati City:

- 4.2.1. **Promote Drive Smart:** If driving on a regular basis, make sure that driving smart. Drive within the speed limit; make sure that there aren't a lot of things in car that will weigh it down, and do all that can to conserve the amount of gas that will be using on a regular basis
- 4.2.2. **Regular Pollution Check up Champs:** It's important to go for regular check up of vehicle to make sure it does not consume extra fuel. This will not only save money but vehicle will also last longer
- 4.2.3. **Consider "going green":** There are so many options for going green out there and a lot of them come with tax breaks that can make it even easier. Look into local, state, and even federal initiatives in order to see if they have something that can help change tune

- 4.2.4. **Plant a Garden:** Plant a garden that is going to give the air the nutrients that it needs to be cleaner. There are so many plants out there that will eat up the junk in the atmosphere
- 4.2.5. **Aware about Use Low-VOC or Water-based Paints:** Use paints that are based with water and not oil. The less oil products that are using, the better off that going to be because that means less oil is being produced overall
- 4.2.6. **Aware about Turn off Lights When not in Use:** Don't keep the lights or other electric devices on. The more traditional power that are using, the more energy wasting, and the more that polluting the air
- 4.2.7. **Make use of Solar Energy:** Consider using solar power instead of regular power. Solar power can save a ton of energy for you and, on top of that, it could also end up saving you a lot of cash in the long run as well
- 4.2.8. **Always Use Recyclable Products:** Always use recyclable products if access to them and the ability to choose them. They take less power to make **than** other products
- 4.2.9. **Use Both Sides of Paper:** Use both sides of a piece of paper. Otherwise, just **being** wasteful with the things that are using
- 4.2.10. **Reuse Paper Bags:** Reuse paper bags; they work really well for almost anything can imagine and they are recycled in the first place
- 4.2.11. **Avoid Plastic Bags:** They are made from oil products and they can hurt the environment because it takes them forever to decompose (and some never decompose).
- 4.2.12. **Choose Products With Minimal Packaging:** When it comes to buying items from outside, consider buying those with minimal packaging, and are reusable. Even if they are packaged, try to buy the one with least packaging
- 4.2.13. **Use Broom Instead of Leaf Blower:** Don't use items that are going to kick up a lot of dust into the air; consider using other items instead. For example, instead of using a leaf blower, why not consider using a broom instead?
- 4.2.14. **Don't Use Hazardous Chemicals:** Materials that have a lot of chemicals and smell strongly, consider using them outside and/or not using them at all

- 4.2.15. **Insulate the Leakages:** Utilize insulation in and around home in order to make it so that don't have to use as much energy in order to heat home
- 4.2.16. **Get an Energy Audit Done:** Get an audit on home that is related to energy efficiency, and ask the auditor about changes that can make in order to ensure that home is as energy efficient as possible. They can give recommendations that will help out and even save money in the long run
- 4.2.17. **Reduce, Reuse, Recycle:** Recycle as much that it can be reused later on in other products. Adding to the problem by adding additional products to the mix of what is going on.
- 4.2.18. **Buy Items Made From Recycled Materials:** If possible, purchase items made up from recycled materials rather than buying fresh products. This will reduce the need to buy new raw materials to produce fresh items. When shopping spree, look for items having a recycle logo or are at-least made from recyclable content.
- 4.2.19. **Buy Rechargeable Batteries:** Every year billions of batteries are sold and then disposed off after use. Buy a charger and few sets of rechargeable batteries and that should pay off in no time.
- 4.2.20. **Buy ENERGY STAR Products:** Whenever buy new electronic products for home or office, always buy ENERGY STAR products. These products have to meet certain requirements for energy savings.
- 4.2.21. **Use Cold Water Instead of Hot:** It's better for the environment if opt to go ahead and use cold water for laundry instead of hot water, because aren't going to use hot water heater, which uses extra fuel and puts it into the environment.
- 4.2.22. **Contribute:** See if state or local government already has initiatives that could end up helping to contribute to making the air quality in and around area better than it would have been otherwise.
- 4.2.23. **Talk to Local Representatives:** Talk to local representatives and government officials about the concerns that related to the clean air issues in community and encourage them to act on it and take care of those issues so that we can leave our world a better place for our children.
- 4.2.24. **Educate Your Companions:** Let the people around know about how they can contribute to clean air initiatives and educate them about all of the different ways that they can take care of the environment themselves.
- 4.2.25. **Join an Environmental Group:** In case you are willing to contribute towards growing pollution in your area, consider joining any environmental

group. You can meet people, discuss issues, and share ideas on what can do about it. Spread the work and ask to join in this noble cause.

4.5 Pollution Control Measure

Findings from the Environmental Status report of the Amravati Municipal Corporation jurisdiction. An Environmental Management Plan (EMP) has been prepared. This EMP gives the measures in brief. The AMC may adopt these measures for the protection and betterment of the environment. The objective behind these measures is to assist the AMC to achieve flawless environmental improvements on continual basis. Accomplishment of these measures will help to maintain the overall environment in good condition and the people in the area will experience a good quality of life.

Based on land use and land cover and baseline quality observations following measures are suggested:

Subject	Control Measures
Land Practice	<ul style="list-style-type: none"> • A survey should be carried out from time to time to take review and for the update of the current land usage. • The steps should be taken to modify existing gardens and develop new gardens and play grounds on the plots specified for the same. • A proper arrangement, space allotment and parking lots should be done in the crowded areas such as market. This will improve the flow of vehicles and people smoothly. • Forest areas must be preserved. Strict rules should be implemented about tree cutting. Tree cutting should be avoided. • Open areas be observed which may turn into dumping yards as people may develop tendency to throw solid waste or any other rubbish to these areas. • The low-lying open plots may be leveled with rubble generated in the town. • Slum development has to be controlled. It leads to unhygienic conditions in the area and surrounding and results into low living quality, spread of epidemic diseases.

Subject	Control Measures
	<ul style="list-style-type: none"> • Address the issue of illegal constructions in the region and dilapidated buildings. • Housing scheme should be encouraged on slum. • Take measures and all possible necessary steps to improve the living conditions of the low income areas.
Public Health & Hygiene	<ul style="list-style-type: none"> • A proper database of all the bio medical wastes needs to be generated along with the facilities available at every place. • The solid waste collection should be ensured. The sludge removed from gutters should be disinfected. The low lying areas should be leveled. • The disinfectants should be spread on open gutters and places wherever water logging is there. • Spraying of disinfecting fogs should be carried out regularly to control the Larvae and Mosquito. • Precautions should be taken to control rodents. • Attention should be paid to the best planning to fight against the epidemics based on the current findings of epidemic diseases in the region. • Periodic visits should be carried out to all the hospitals and clinics to check their level of efficiency. • Biomedical waste disposal of the hospitals and clinics should be checked. AMC should ensure that they are using the facility for biomedical waste disposal. • The vaccination and Health camps should be organized on regular basis. • Awareness campaign should be carried out about the epidemics and other health improving practices. • Proper and periodic medicinal facilities should be made available for the low income group at a reasonable price.
Water	<ul style="list-style-type: none"> • The efforts should be taken to provide the public sufficient per capita at 135 lit/day clean and safe water from M.J.P.

Subject	Control Measures
	<ul style="list-style-type: none"> • The Water Treatment Plant (WTP) of required capacity shall be constructed and efficiency of existing water treatment plant needs to be monitored to meets the necessary criteria for all parameters mentioned for the drinking water e.g. turbidity, residual chlorine levels etc. • Water conservation programs needs to be implemented. Use of ground water for the construction and other activities should be restricted. Rainwater harvesting possibilities should be explored and it should be implemented wherever possible • Quality monitoring of potable water, treated & untreated sewage, lakes water, Nallahs, and holding ponds is essential tasks to be done regularly in order to safeguard the health of citizen of Amravati. • Quality of potable water is regularly checked to safeguard citizen from water borne disease and whenever complaints are received about bad quality of water • It is obligatory to check quality of treated sewage every day before discharge into surrounding water to safeguard water sources being polluted. • Nallahs in AMC area many times carries polluted water from industries in MIDC area and whenever complaints are received. It becomes necessary to investigate the quality of water by sampling and analysis to find the root reason for the pollution. • Need a detailed survey for identification of groundwater hydrology condition of AMC • Use of treated water from the STP should be encouraged for the activities such as construction, gardening etc. based on feasibility.

Subject	Control Measures
Water Bodies	<ul style="list-style-type: none"> • Periodic (Quarterly) comprehensive water analysis should be done to check the water quality and pollution levels at various sources • Instruction Boards should be placed near water bodies to aware and instruct people to avoid the pollution of water. • Artificial ponds should be created for Ganesh Chaturthi and Durgapuja People should be promoted to adopt Eco friendly Ganesh idols. • The Nirmalya Kalash to be provided at each lake and water body where dropping of Nirmalya is observed commonly. • Lakes should be considered for recreational activities. Necessary changes need to take place at locations for the same. • The bio remediation of the lakes may be done to keep the lakes clean. • All the water reservoirs, lakes, river should be maintained in good condition by improving their cleaning and by arresting the sewage discharging in it.
Sewage	<ul style="list-style-type: none"> • Inspection should be conducted to assess the condition of existing drainage system in order to check its choke ups, leakages etc. to take suitable measures for its proper maintenance and to avoid logging. • The work for laying new underground drainage lines is in progress. The measures should be taken to speed up the same so that the sewage will be effectively collected. • The orders should be issued to the owners to connect their sewage lines to the property chambers within a specified period where the drainage work is complete. • The efforts should be made to collect all sewage generated to STP and STP should be operated efficiently to maintain the ecological status of the receiving water body. • The Sewage Treatment Plant (STP) needs to be augmentation and shall be monitored to meets the

Subject	Control Measures
	<p>necessary criteria for all parameters mentioned for the discharge water.</p> <ul style="list-style-type: none"> • The Housing Societies with significant sewage should be promoted to setup the sewage treatment plant and recycle the treated water. • M.J.P. shall insists property holders to complete the property connection with underground drainage system.
Air	<ul style="list-style-type: none"> • To carry out regular (Monthly/Quarterly) air monitoring at prime locations in order to get idea of air quality and to continue with the necessary measures to reduce pollution levels. • To avoid air pollution from the traffic congestion, parking arrangement should be made in town and quality of roads needs to be improved. • To do Tree Plantation along road sides and at open places wherever possible. • To do Road widening wherever possible for smooth traffic flow. • Proper traffic management should be done with support of RTO and local police to avoid traffic jams. • Displays of Air Quality status can be provided at the council office and main traffic signals.
Noise	<ul style="list-style-type: none"> • To take regular Noise levels at prime locations in order to get an idea of Noise pollution and to take the necessary measures to reduce Noise levels. • Zones should be created in accordance with the pollution control norms to limit the noise levels. E.g. Silence zones in the areas where in hospitals, schools are located. • Planting trees with high foliage density along roads to reduce impact of noise could be undertaken • Installing decibel meters for monitoring noise levels along highway and other major roads, and also near sensitive localities like schools and hospitals; • Within limit use of loud speakers, which have become a

Subject	Control Measures
	<p>part of festivals, Weddings and prayers; Writing slogans for education of public regarding impacts of noise on health</p> <ul style="list-style-type: none"> • Banning blowing of horns, especially at traffic junctions. • Installation of Sound barriers. • Implementation of the norms related to the Noise Pollution and strict action needs to be taken on the violators
Solid Waste	<ul style="list-style-type: none"> • Increased waste collection and disposal facilities for extra generated waste on priority basis. • To carry out regular monitoring of the Solid Waste Management Sites. • The mechanism for segregation of solid waste should be adopted and implemented for proper disposal of the solid waste as per their type such as grit, plastic, glass, metal and biodegradable solid waste etc. • Efforts should be made to collect maximum biodegradable solid waste and to run the Biogas Plant with optimum capacity. • The composting of biodegradable wet solid waste can be initiated. • Proper means of collection and transportation should be made available so that littering of solid waste on roads, Odour problem during transportation can be avoided. • Encouraging common hazardous waste management facilities for industries located in Amravati Division . • The comprehensive disposal facility for the solid waste generated in city, shall be provided on the existing compost depot instead of acquired fertile lands. • Encouraging industries to adopt better manufacturing processes, train workers to reduce quantities of hazardous waste generation, and substitute hazardous ingredients with non-hazardous or less hazardous ingredients; • Playing a catalytic role in organizing seminars, workshops and training programmes for industrial waste minimization. • Collection of waste from Vegetable markets restaurants and hotels should be done separately • AMC should promote Municipal organic waste compost by setting up of Fruit & Vegetable Waste, hotel organic waste Compost Units under Municipalities and use as

Subject	Control Measures
	manure from in the public gardening as well as farming.
Environment and Safety Awareness	<ul style="list-style-type: none"> • Frequent Campaigns should be done among the masses for the Awareness of Pollution problems, Health issues, Tree plantation, Water conservation, Not to cause Noise pollution by bursting cracker, use of Nirmalya Kalash, Anti Plastic, adopt Eco Friendly Ganesh idols etc. • Awareness campaigns should be carried out at the school, college, organizations, institution as well as local level to propagate the knowledge. • Safety awareness program should be arranged. • Conducting audit of AMC departments for identifying opportunities of pollution prevention; • Encouraging industries to adopt pollution prevention technologies; • Encouraging local colleges and institutions for organizing awareness campaigns for pollution prevention
Water conservation	<ul style="list-style-type: none"> • For the effective implementation of the Rain water harvesting regular Monitoring shall be done after issuing of building permission for construction activity. • The public wells shall be rejuvenated and strictly prohibited from littering. • The old pipe lines and stand post taps shall replaced by H.D.P. E. lines.

4.6 Another Issue which is Important to Address to Improve Sustainability of the City

A sustainable community uses its resources to meet current needs while ensuring that adequate resources are available for future generations. It seeks improved public health and a better quality of life for all its residents by limiting waste, preventing pollution, maximizing conservation, promoting efficiency, and developing local resources to revitalize the local economy.

"Sustainable communities are defined as towns and cities that have taken steps to remain healthy over the long term. Sustainable communities have a strong sense of place. They have a vision that is embraced and actively promoted by all of the key sectors of society, including businesses, disadvantaged groups, environmentalists, civic associations, government agencies, and religious organizations. They are places that build on their assets and dare to be innovative. These communities value healthy ecosystems, use resources efficiently, and actively seek to retain and enhance a locally based economy.

There is a pervasive volunteer spirit that is rewarded by concrete results. Partnerships between and among government, the business sector, and non-profit organizations are common. Public debate in these communities is engaging, inclusive, and constructive. Unlike traditional community development approaches, sustainability strategies emphasize: the whole community (instead of just disadvantaged neighborhoods); ecosystem protection; meaningful and broad-based citizen participation; and economic self-reliance." (Institute for Sustainable Communities: <http://www.iscvt.org>)

5.1 Recommendation Policies

Financial Aspect

- 1) Improve municipal services standard on international level on the principal of pay & use.
- 2) Develop essential service on PPP basis & monitor costing aspect.
- 3) To provide garbage / debris or such inert material collection & transportation & its disposal facility on Pay& use basis.
- 4) Municipal standard services such as water purification & supply, super health facility shall develop on PPP basis & Municipal authority having power to price control.
- 5) Imposition of special sanitary tax on hawkers / market places & commercial establishment & effective cost recovery by adding special sanitation tax either in cess tax/ vat tax by amending concern law.
- 6) Develop performance base budgetary system & ULB is under obligation to publish its financial report in international profit & loss A/c.
- 7) Incentive to recycling industry.
- 8) Conduct necessary survey & measures to improve living standard of urban poor by providing health, educational & all other up social lifting scheme.

Public Participation

1. Public participation in information, education, communication, & awareness program.
2. Involvement of professional communicator
3. Hotline information
4. SWM coordinator
5. Strengthen area committee by delegating necessary power development policies at area level & pass expenses incurred thereon, By this way ULB will be unique democratic features having adequate power to maintain essential municipal services and power to collect expenses incurred on municipal services similarly municipal

5.2 Another Issue which is Important to Address to Improve Sustainability of the City

A sustainable community uses its resources to meet current needs while ensuring that adequate resources are available for future generations. It seeks improved public health and a better quality of life for all its residents by limiting waste, preventing pollution, maximizing conservation, promoting efficiency, and developing local resources to revitalize the local economy.

"Sustainable communities are defined as towns and cities that have taken steps to remain healthy over the long term. Sustainable communities have a strong sense of place. They have a vision that is embraced and actively promoted by all of the key sectors of society, including businesses, disadvantaged groups, environmentalists, civic associations, government agencies, and religious organizations. They are places that build on their assets and dare to be innovative. These communities value healthy ecosystems, use resources efficiently, and actively seek to retain and enhance a locally based economy. There is a pervasive volunteer spirit that is rewarded by concrete results. Partnerships between and among government, the business sector, and non-profit organizations are common. Public debate in these communities is engaging, inclusive, and constructive. Unlike traditional community development approaches, sustainability strategies emphasize: the whole community (instead of just disadvantaged neighborhoods); ecosystem protection; meaningful and broad-based citizen participation; and economic self-reliance." (Institute for Sustainable Communities: <http://www.iscvt.org>)

5.3 Restoration and Beautification of Lakes

Challenge

Aquatic ecosystems perform numerous valuable environmental functions such as recycling of nutrients, purify water, recharge ground water, augment and maintain stream flow, and provide habitat for wide variety of flora and fauna and recreation for people. Various anthropogenic activities alter the physical, chemical and biological processes within aquatic ecosystems. Restoration means returning an ecosystem to a close approximation of its condition prior to disturbance. This ensures that the ecosystem structure and function are recreated or restored, and that natural dynamic ecosystem

processes operate effectively again. The most widespread problems facing lakes is hydrologic and physical changes and siltation from catchment activities resulting in spatial decline. There are 2 lakes in AMC area. These lakes need restoration and beautification for maintenance of aquatic ecology and improving quality of environment.

Plan for Achievement

- Identifying sources of pollution of the lakes
- Restoring physical, chemical and biological integrity of lakes by controlling nonpoint source of pollution
- Development of plans for watershed restoration through collaboration among scientists, economists, managers, policy makers and local people;
- Restoration of all types of habitats with priority to the habitats of endangered species; and
- Beautification of lakes with involvement of private sector

5.4 Promotion of Use of Renewable Energy**Challenge**

In the past century, it has been seen that the consumption of non-renewable sources of energy has caused more environmental damage than any other human activity. Electricity generated from fossil fuels such as coal and crude oil has led to high concentrations of harmful gases in the atmosphere. This has in turn led to many problems being faced today such as ozone depletion and global warming. Hence, alternative sources of energy have become very important and relevant to today's world. These sources, such as the sun and wind, can never be exhausted and therefore are called renewable. They cause less emission and are available locally. Their use can, to a large extent, reduce chemical, radioactive, and thermal pollution. They stand out as a viable source of clean and limitless energy. These are also known as non-conventional sources of energy. Most of the renewable sources of energy are fairly non-polluting and considered clean though biomass, a renewable source, is a major polluter indoors.

A host of fiscal incentives and facilities are available to both manufacturers and users of renewable energy systems, which include:

- 100% accelerated depreciation for tax purposes in the first year of the installation of projects/systems;
- No excise duty on manufacture of most of the finished products. Low import tariffs for capital equipment and most of the materials and components;
- Soft loans to manufacturers and users for commercial and near commercial technologies;
- Financial Incentives/Subsidies for devices with high initial cost;
- Encouragement to NGOs and small entrepreneurs; and
- Allotment of land on long term basis at token lease rent and supply of garbage free of cost at project site by State Governments, in respect of projects on energy recovery from municipal waste.

Plan for Achievement

- Conducting energy audit of AMC buildings/plants;
- Installation of solar water heaters for government buildings;
- Installation of photovoltaic systems for garden and street lighting;
- Replacement of incandescent lamps with LED in government buildings/street lights;

5.5 Strategy for Improving Public Transport

Considering the poor patronage of public transport and consequent alarming growth of 2 –wheelers calls for intervention from planning and Government authorities. Pro-active policies from government are required to encourage the public transport.

AMC should aim at following realistic targets for achieving proper share for Public transport:

- In short term (within a year) AMC should target around 25000 to 30000 thousand passengers/ day with a fleet size of 50 to 60 buses.

- In medium term (with 2 to 3 years) AMC should target around 1.0 lakh passengers /day with a fleet size of total 100 buses.
- Traffic & Transportation survey should be done and a Master Plan should be prepared for 10 to 15 years to incorporate systematic Traffic & Transportation Management practices in future.
- The following steps should be taken to improve the Public transport:
 - Bus stops should be provided every 450m to 500m.
 - Access to all bus stops should be improved.
 - Feeder service (such as auto) should be encouraged to Bus stands.
 - Frequency of the buses should be increased from current 15 min to 5-10 min
 - There are no proper bus stops at present. Construction of new bus stops/ improvement of existing bus stops should be planned with proper signage and information display. Public –private partnership (PPP) model can be considered for adoption.
 - Transport authority should issue a timetable and public awareness campaign should be carried out. Transport Authority should handle services professionally with a motto of serving the people. There should be public relationship officer who is available to clarify / alleviate the public transport related issues.
 - Public transport bus should target the education trips by introducing monthly concessional passes at 50% of the cost, although monthly passes are being served to the students. This is a first step, which is expected to increase the modal share in favour of bus. New routes should be planned to cater to educational trips.
 - For other category of commuters, some form of monthly passes should be introduced with 10% -25% of discount.
 - The coverage of bus service (<40%) should be improved and more bus routes needs to be planned.
 - New bus terminals should be planned and constructed.

- Private vehicles should be discouraged by imposing pollution levy and higher registration fees. Restrictions and heavy penalties should be imposed for unauthorized on-street parking. Off –street parking should be made costly and no subsidies should be given. Off –street parking facilities should be self –sustaining. These measures should only be carried once ensuring adequate supply of public transport with good level of service and frequency.
- For safety of pedestrians, separate foot ways/ footpath should be provided along the carriageway of urban street. As per IRC, the recommended minimum width is 1.5m. The width of the footpath depends upon the pedestrian flows. However research in Mumbai suggests footpath width should be minimum 2.5m for effective usage.
- Cyclists create conflict with fast moving vehicles at narrow streets, congested areas, intersections etc. The result is that the cyclist is involved in a number of accidents. So, to improve the safety and mobility, segregation of traffic is needed. However with ever – increasing demand for road space, this may not be feasible to allocate dedicated lane to cyclists. However AMC can consider a pilot project and results can be evaluated. The minimum width of a cycle track shall be two lanes.

5.6 Recommendations for Traffic and Transportation

One of the recommendations of the Regional Plan is to immediately undertake detailed studies and prepare a traffic and transportation plan for the Amravati City. The following broad policies need to be incorporated:

- Where pedestrian traffic is heavy, it should be segregated by developing pedestrianization scheme and pedestrian segregation facilities.
- Entry to the mechanized vehicle should be controlled progressively in the central part of the city where the pedestrian and cycle traffic is very heavy, deserving priority.

- Parking spaces should be developed for bringing control on motorized vehicles in the central parts of the city and making the full capacity of existing road network for traffic movements.
- The through (fast) traffic and the local traffic on highways should be segregated by developing a system of service roads along the highways or by diverting the highways along the ring road of the city.
- With a view to providing a cheap mode of transport an alternative system for the cyclists and users of other modes and to reduce congestion on the arterial roads, the mass transportation services should be augmented substantially by developing higher capacity mass transportation of buses and railway and creating infrastructure for the purpose.
- Movement of goods vehicles should be controlled by providing necessary infrastructural facilities for goods transport, such as truck terminals, parking and repairs facilities.
- For reducing the traffic congestion hawkers and other road encroachers shall have to be moved to outer areas and main traffic roads will have to be made shopping free roads. Parking of vehicles will be insisted within the compounds of the premises.

Awareness Campaigns

Various events were organized by the Regional Transport Office (RTO) to create awareness among the citizens of Amravati city about the various rules & regulations about the road safety. The main highlights of these events are summarized below:

- Photo Exhibition was organized
- Awareness through display of banners
- Distribution of Handbills of Traffic Rules
- Eye checkup camp arranged for drivers on National Highway No. 6 near toll naka
- School Children and other residents were given information about traffic Rules
- Helmet checking expedition done for Two Wheelers vehicles
- Reflectors were distributed to the hand carts, bullock carts & tractor trailers

- At the Irwin Square PUC checking camp were held free of cost with the cooperation of PUC Centers and Certificates were issued.

Action Points for Environmental Conservation

- Launch extensive awareness drive against polluting vehicles, Immediate
- Ensure Strict Action against visibly polluting vehicles;
- Take steps to prevent parking of vehicles in the non-designated areas;
- Introduce early alarm system for benefit of commuters related to traffic congestion on major routes for route diversion;
- Consider introducing plan for Flexi/staggered timings to minimize peak movement of vehicles on the road
- Take steps for retrofitting of diesel vehicles with Particulate Filters;
- De-congest pathways;
- Synchronize traffic movements / Introduce intelligent traffic systems for lane-driving;
- Install vapor recovery system in fueling stations
- Take steps for installation of remote sensor based PUC system etc.;
- Formulate action plan for controlling decongestion of fuel stations including increasing number of dispensing machines;
- Prepare action plan to check fuel adulteration and random monitoring of fuel quality data;
- Prepare action plan for public transport on CNG mode;
- Undertake road widening and improvement of infrastructure for decongestion of road
- Promote battery operated vehicles
- Take steps to expedite early completion of Western and Eastern Peripheral expressway and submit completion schedule

Chapter-6**Action Plan for Control of Air Pollution in Amravati City**

1. **Name of the city:** Amravati
2. Air Pollution concerns: RSPM, SO₂, NO₂ and CO direct concern and emitted as gases, convert to particles downwind where they are included in measurements of particle levels.
3. Air pollution levels: 24-hourly average concentration values and CO for 8 Hourly Basis;
4. Months with high air pollution levels: December to March

The conventional approach to addressing the air pollution has been driven by the need to set standard guidelines for ambient concentration of pollutants and develop regulatory policies and implementation plans to not to let the pollution concentration exceed that level. The ambient (outdoor) air quality has been taken as an indicator of population exposure. This is the standard regulatory practice across the world. This approach helps primarily to assess the variation in trend over time and space to reflect the exposure situations and also the impact of pollution control efforts on long term trends.

Air quality monitoring: Ambient air quality information is collected from MPCB and primarily by the National Air Quality Monitoring Programme (NAMP) administered by the Central Pollution Control Board (CPCB), Ministry of Environment, Forests and Climate Change, Government of India.

Evaluation of Emission Control Options

Source group	Control option	Expected reduction and impacts ¹	Technical feasibility ²	Requirement of financial resources ³	Implementation period (Short/Mid/Long-Term)	Time target for implementation ⁴	Responsible agency (ies)	Any other information
Vehicle	<ul style="list-style-type: none"> • Electric vehicles • Maintenance Inspection and Standards • Better road Maintenance • Extensive drive against polluting vehicles for ensuring strict compliance launch • Launch public awareness campaign for air pollution control, vehicle maintenance, minimizing use of personal vehicles, lane discipline, etc. • Prevent parking of vehicles in the non-designated areas. • Prepare action plan to check fuel adulteration and random monitoring of fuel quality data. 	Medium	<ul style="list-style-type: none"> • Yes • Phase out vehicles above a certain age 	<ul style="list-style-type: none"> • As per Budgetary provision • Phasing out fuel subsidies, uniform pricing all over the state followed by country 	Long Term	2017-2022	<ul style="list-style-type: none"> • Regional Transport office • City Police • District supply Officer & Tahsildar • B & C • AMC 	<p>The level of compliance. How many vehicles come for inspection currently and failure rate for different categories of vehicle?</p> <p>Policy adapt as measures to ensure that all vehicle come for tests</p> <p>Modification in test procedures and standards and additional pollutant to be introduced for testing in all categories of vehicles planned.</p> <p>Institutional systems put in place or planned for rigorous</p>

	<ul style="list-style-type: none"> • Phase out of 15 old of 15 year old commercial vehicle • Public Transport the current status of public transport in terms of number of buses, load factor etc, and proposed plans to argument the fleet • Plan to move public transport to run on clean fuels • Recommend an “avoid-shift-improve” framework as a way of prioritizing actions to manage health impacts from vehicles. 							auditing and inspection centers. On road inspection of vehicles planned and periodicity and coverage
Re-suspension of Road Dust	<ul style="list-style-type: none"> • Prepare plan for creation of green buffers along the traffic corridors. • Maintain potholes free roads for free-flow of traffic. • Introduce water fountains at major traffic 	Medium	<ul style="list-style-type: none"> • Yes • Phase out vehicles above a certain age 	<ul style="list-style-type: none"> • As per Budgetary provision • Phasing out fuel subsidies, uniform pricing all over the state followed by country 	Long Term	2017-2022	<ul style="list-style-type: none"> • Regional Transport office • City Police • District supply Officer & Tahsildar • B& C • AMC • Maharashtra jeevan Pradhikaran 	

		intersection, wherever feasible. • Greening of open areas, gardens, community places, schools and housing societies. • Blacktopping of metaled road including pavement of road shoulders.							
Household Pollution	Air	• Making clean sources available • Making ubiquitously available sources (i.e., biomass) clean.	Yes	As per Budgetary provision	Medium	2017-2019 20% Improvement	Amravati Municipal Corporation	• Yes • Phase out vehicles above a certain age	In the case of the former, issues such as fiscal policies and distribution systems designed to make clean energy affordable and accessible to the poor will need particular Attention.

Trash burning	<ul style="list-style-type: none"> • Trash burning is a significant contributor to the overall pollution load in cities, and since the burning occurs primarily in highly populated areas such as residential neighborhoods, it leads to high exposures through high intake fractions. • Controlling trash burning will require strict enforcement of existing legislation banning the practice, teamed with improved 	Yes	As per Budgetary provision	Medium	2017-2019 10% Improvement	Amravati Municipal Corporation	<ul style="list-style-type: none"> • Yes • Phase out vehicles above a certain age 	Kindly refer Annexure-I For Burning action taken for trash burning
----------------------	---	-----	----------------------------	--------	------------------------------	--------------------------------	---	--

	infrastructure for collection and composting of vegetative waste and overall waste management.							
<i>Diesel generator sets:</i>	<ul style="list-style-type: none"> Diesel generator sets, primarily located in residential areas or in commercial buildings, are a significant contributor to the pollution load in cities. As the electricity supply becomes more reliable, the use of diesel gensets should be discouraged. But as an interim measure, BEE-rated diesel generators that are more efficient and less polluting should be 	Yes	As per Budgetary provision	Short term	2017-2019 5% Improvement	Amravati Municipal Corporation	<ul style="list-style-type: none"> Yes Phase out vehicles above a certain age 	

	promoted as alternatives. Also the emissions standards for generator sets could be significantly tightened.							
Road and construction dust:	<ul style="list-style-type: none"> Dust from local sources such as from areas of little or no green cover, construction sites, and resuspension of road dust, is a major contributor to particulate matter (PM) levels in cities. Strategies to manage this form of pollution, and exposures to it, include 	Yes	As per Budgetary provision	Medium term	2017-2019 40% Improvement	Amravati Municipal Corporation		

	formal adoption of dust control regulations and techniques including the implementation of street design guidelines for footpaths and cycle tracks with adequate vegetative barrier and paving without compromising recharge zone along the roads for ground water; putting in place guidelines for eliminating others local sources of							
--	---	--	--	--	--	--	--	--

	dust (such as construction materials and waste); providing vegetative barriers – shrubs and trees wherever possible; limiting vehicular speed to reduce dust; implementing truck loading guidelines to control dust; use of appropriate covers for trucks and other hauling carriers; and gravel paving for all haul routes.							
<i>Brick kilns and other</i>	These are significant	Medium	<ul style="list-style-type: none"> • Yes • Phase out 	<ul style="list-style-type: none"> • As per Budgetary provision 	Long Term	2017-2022	AMC and MPCB	

<i>local industries:</i>	contributors to the pollution load of cities as they are usually located just within or outside city limits, and the fuel sources they use (coal or agriculture residue) are highly polluting. A roadmap for tackling emissions from brick kilns would involve the phasing out of inefficient and highly polluting technology, and developing and implementing emissions standards that are in line with the technology		vehicles above a certain age	<ul style="list-style-type: none">• Phasing out fuel subsidies, uniform pricing all over the state followed by country				
--------------------------	---	--	------------------------------	--	--	--	--	--

	standards, enforcing bans on inefficient kilns and promoting alternative building material and bricks.							
<i>Large sources (such as industries)</i>	<ul style="list-style-type: none"> These sources will require two levels of action – Emissions standards to ensure quicker uptake of clean technologies to reduce overall emissions across the country and tight particulate standards for power plants and also introduce standards for 	Medium	<ul style="list-style-type: none"> Yes Phase out vehicles above a certain age 	<ul style="list-style-type: none"> As per Budgetary provision Phasing out fuel subsidies, uniform pricing all over the state followed by country 	Long Term	2017-2022		

	nitrogen oxides, sulphur dioxides. Industry will also need a sitting policy to ensure these are not located close to densely populated habitats. These sources will also require strong compliance monitoring							
--	---	--	--	--	--	--	--	--

1. Preferably, quantify each priority pollutant. Otherwise, a qualitative statement (low/medium/high) may be given.
2. Whether it is technically feasible (e.g., replacing coal with natural gas may not be feasible, if its sustained availability is not assured); whether any implementation issues exist (e.g., low-income group may not have finances to use liquefied petroleum gas for cooking).
3. Estimate the total costs (investment and maintenance costs) over the duration of implementation period, and provide sources of financing.
4. Define the expected start and completion year (e.g., 2017-2020).



2018-2019

Environmental Status Report Amravati

Evaluation of implementation barriers and required actions

Sr. No.	Control option	Identified barriers				Required actions			
		Institutional regulatory, and policy framework	Economic, Investment, and market	Human resources and private sector support	Public awareness	Institutional, Regulatory and policy framework	Economic, investment and market	Human resources and private sector support	Public awareness
						Reduction in diesel	Improvement in emission standards as well as legislation for stringent fuel standards for, Phasing out the subsidies on diesel. Bringing diesel cost at par in a state/centre	High cost. Being planned by Refineries as per the Auto Fuel Policy.	<ul style="list-style-type: none"> Public awareness program me to empower citizens to report small sources but highly prevalent Inclusion of road construction related burning in rules
	Ensure on-schedule implementation of BS VI fuel and Emission standards, including early delivery of BS VI fuel for vehicles to modify technologies. Ensure registration of only BS IV vehicles from April 1, 2017 and only BS V	State transport departments, Ministry of Road Transport and Highways (MORTH) and Ministry of Petroleum and Natural Gas (MOPNG)			Generation of knowledge about the waste valorization field through the				

	Incompliant vehicles from April 2020				collaboration with universities.				
	<ul style="list-style-type: none"> • Introduce battery-operated vehicles in targeted segments of two-wheelers, three-wheelers, and buses. Plan infrastructure for charging and battery disposal. • Identify and notify commercial areas in cities with high footfalls and good public transport and goods transport connectivity that can be pedestrianized, supported by zero emission battery-operated vehicles: Priority may be accorded to battery-operated para-transit as feeders and for last mile connectivity in such areas 								
	<ul style="list-style-type: none"> • Auditing of Pollution under Control (PUC) certification centre 								

Action Plan for Control of Air Pollution

Research studies including air pollution inventory, source apportionment, health impact studies, exposure impacts and other relevant studies: Govt. to support research works / scientific studies by academic / research institutions. Expertise will be sought from various institutions to develop protocols for assessment of the research proposals.

Source group	Control option	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency (ies)	Any other information
Vehicles and Road dust	<ul style="list-style-type: none"> • Improve traffic flow • Decongest the city roads; • Reduce accidents on city roads; • Provide safe, convenient and pollution free atmosphere for vehicular and pedestrian traffic; • Segregate directional traffic and vehicular and pedestrian movement; • Provide parking facility to traffic; • Encourage public transport and 	Mid	2018-2022	RTO & AMC	

	<p>discourage personalized modes</p> <ul style="list-style-type: none">• Inculcate basic traffic discipline amongst the citizens• Vehicles are one of the major contributors of ambient air pollution and exposure in urban areas. Since this pollution is emitted in areas where there are many people (both others traveling on or near roads as well as those residing or working nearby), the exposure levels (and intake fractions) are quite significant, which makes the control of such pollution very salient.• There are a range of control measures to				
--	---	--	--	--	--

	<p>mitigate health impacts from vehicular pollution. Borrowing terminology from the transport area, we recommend an “avoid-shift-improve” framework as a way of prioritizing actions to manage health impacts from vehicles.</p> <ul style="list-style-type: none"> • Introduce battery-operated vehicles in targeted segments of two-wheelers, three-wheelers, and buses. • Plan infrastructure for charging and battery disposal. 				
Biomass and garbage burning	<ul style="list-style-type: none"> • While burning of vegetative waste can be contained through municipal agencies by 	Mid	2018-2022	RTO & AMC	

	improving the infrastructure for collection, composting and distribution of compost material and by penalizing for non-compliance, night-time trash burning by the poor for heating (in colder areas) can be reduced with enhanced access to affordable electricity				
DG SET	<ul style="list-style-type: none"> Diesel generator sets can also be a significant contributor to the air pollution load in cities. And, as with trash burning, these generator sets – often powering residential or commercial buildings – are located in areas with significant populations, 	Short	2018	AMC and MPCB	

	<p>again leading to high exposures.</p> <ul style="list-style-type: none">• The emission from these generator sets can be reduced by mandating stringent emission controls (certainly more than for mobile diesel vehicles, but that also should be possible since these run at a constant load).• As the electricity supply becomes more reliable, the use of diesel generator sets should be discouraged.				
Road and construction dust	<ul style="list-style-type: none">• A major part of this dust comes from local sources – from open areas that have limited or no green cover, construction				

	<p>sites, and re-suspension of dust from the road.</p> <ul style="list-style-type: none">• Strategies to manage this form of pollution, and exposures to it, include formal adoption of dust control regulations and techniques.• For road dust, this could include the implementation of street design guidelines for footpaths and cycle tracks with adequate vegetative barrier and paving without compromising recharge zone along the roads for ground water; putting in place guidelines for eliminating				
--	---	--	--	--	--

	<p>others local sources of dust (such as construction materials and waste); providing vegetative barriers – shrubs and trees wherever possible; limiting vehicular speed to reduce dust; implementing truck loading guidelines to control dust; use of appropriate covers for trucks and other hauling carriers; gravel paving for all haul routes.</p> <ul style="list-style-type: none">• Also consider phasing in mechanical/ vacuum based street sweeping wherever feasible and needed or the				
--	---	--	--	--	--

	<p>sprinkling of recycled water to reduce dust circulation (but not by compromising other uses of water).</p> <ul style="list-style-type: none"> • Construction dust can be addressed by enforcing good construction practices and making construction industry accountable for safe disposal and recycling of construction and demolition waste. 				
<i>Large sources (such as industries and power plants):</i>	<ul style="list-style-type: none"> • These sources will require two levels of action: • Emissions standards to ensure quicker uptake of clean technologies to reduce overall emissions across 				

	<p>the country and tight particulate standards for power plants and also introduce standards for nitrogen oxides, sulphur dioxides, and mercury to reduce exposure to power plant emissions.</p> <p>Industry and power plants will also need a siting policy to ensure these are not located close to densely populated habitats to reduce exposure and intake fraction. These sources will also require strong compliance monitoring.</p> <p>For some areas, such as coastal ports, shipping may be a major polluter and steps to manage pollution from these</p>				
--	--	--	--	--	--

	<p>sources – for example, mandating strict limits on the use of their engines and quality of fuels in proximity to the port – may be taken.</p> <p><i>vii. Other assorted sources (such as street vendors):</i></p> <p>There also are other cases where each polluter may be small but again, their location in areas with significant footfall, such as in the case of street vendors, is likely important because of high exposure and intake fraction, not least for the vendor due to the many hours of use. There are few data on this but this may be worthy of consideration.</p> <p>Again, the solution</p>				
--	---	--	--	--	--

	here would be to supply clean forms of energy for cooking and heating.				
--	--	--	--	--	--

Vehicular sources

- a. Better vehicle technology
- b. Better maintenance of vehicles
- c. Improved traffic management
- d. Better road conditions and pavements
- e. Improved tail pipe treatment/catalytic converter/particulate filter
- f. Improved use of oxygenates/ performance additives
- g. Improved fuel quality.




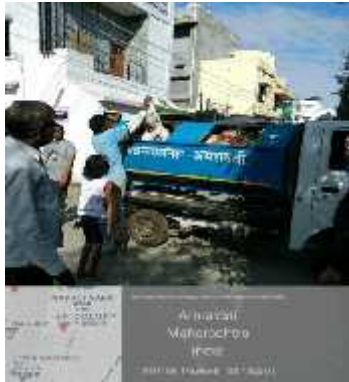
Industrial sources

- a. Growth or decline of industries
- b. Fuel quality improvement
- c. Fuel shift
- d. Better production technologies
- e. Improved emission control technologies
- f. Industrial sitting policy

Area sources

- a. Growth of population
- b. Fuel shift
- c. Fuel quality improvement
- d. Better management
- e. Road dust elimination by better I&M
- f. Public process and social customs

**Photo-Graphic View Environmental Related Activity
By Amravati Municipal Corporation**

Success Story

स्वच्छ सुंदर अमरावतीसाठी तरुणांचा स्तुत्य उपक्रम



‘येथे कचरा टाकु नये’ असे लिहिलेल्या भिंतीजवळच कचऱ्याचे ढीग किंवा ‘येथे थुंकू नये’ असे लिहिलेल्या भिंतीवरच पानाच्या पिचकान्या. ही परिस्थिती सर्रास पाहायला मिळते. आणि याला कारण म्हणजे लोकांची मानसिकता. जिथे स्वच्छ आणि सुंदर भिंत दिसली तिथे काही दिवसातच पानाच्या किंवा गुटख्याच्या पिचकारिचा एक तरी डाग दिसणारच. आणि काही दिवसांनी संपूर्ण भिंत त्या पिचकान्यांनी अशी काही रंगून जाते की त्यावर लिहिलेली सूचनाच दिसनाशी होते. हे रोखण्यासाठी जनजागृती करायची असेल तर ती जनमानसामधूनच व्हायला हवी. आणि याचे एक मूर्तिमंत उदाहरण म्हणजे काही युवकांनी एकत्र येत सुरु केलेला ‘आय क्लीन अमरावती’ उपक्रम.

आपले शहर स्वच्छ आणि सुंदर दिसावे यासाठी अमरावती येथील अभियांत्रिकी चे शिक्षण घेत असलेला ‘आदित्य माथनकर’ आणि त्याचे सात साथीदार यांनी मिळून ‘आय क्लीन अमरावती’ असा अभिनव उपक्रम सुरु केला आहे. या उपक्रमाचा मुख्य उद्देश नागरिकांच्या मनात जनजागृती करणे आणि शहर स्वच्छ आणि सुंदर ठेवण्याचे आवाहन करणे हा आहे. या उपक्रमांतर्गत विद्यार्थी आणि शहरातील सुजाण नागरिक रविवारी एकत्र येतात आणि शहरातील एक अस्वच्छ भिंत साफ करून त्यावर सुरेख असे वारली चित्र काढून पूर्ण भिंत

अतिशय सुंदर रंगवून एकदम देखणी बनवतात. यामुळे 'सुजाण नागरिक' ती भिंत पुन्हा अस्वच्छ करण्यास धजावणार नाहीत असा विश्वास त्यांना असतो. या अतिशय स्तुत्य अशा उपक्रमात त्यांना स्थानिक अधिकारी, राजकीय व्यक्ती आणि समाजातील कर्तव्यदक्ष नागरिकांनी पाठींबा दिलाय. सुरुवातीस ७ - ८ जणांनी एकत्र येऊन सुरु केलेल्या या उपक्रमाच्या कुटुंबाची संख्या आज ६३ सदस्यांच्या घरात पोचली आहे.

या उपक्रमामुळे अमरावती शहरातील तरुण आणि कर्तव्यदक्ष नागरिक स्वच्छता मोहिमेकडे आकृष्ट झाले आहेत. सर्व शहरांतील तरुणांनी या स्तुत्य उपक्रमाची दखल घेऊन प्रत्येक शहरात 'आय क्लीन' सारखा उपक्रम राबविणे काळाची गरज आहे. माननीय पंतप्रधान नरेंद्र मोदी यांनी धरलेली स्वच्छ भारताची कास, माननीय मुख्यमंत्री देवेंद्र फडणवीस यांनी युवकांना घातेलेली साद व त्यास मिळणारा प्रतिसाद पाहता महाराष्ट्रातील सर्व शहरे लवकरच स्वच्छ आणि सुंदर बनणार आहेत यात शंकाच नाही.



अमरावती महानगरपालिका, अमरावती

प्लास्टिक व थर्माकोल बंदी च्या अं

करण्यात

अ.क्र .		करण्यात आलेल्या आस्थापने	रक्कम रु.	प्लास्टिक	क्र .
1.	04/04/2018	पतंजली थर्माकोल ब	रु.5,000/-	40 Kg	1
2.	04/04/2018	च्या शे	रु.5,000/-		1
3.	04/04/2018	सब्जी	रु.5,000/-		1
4.	04/04/2018		रु.5,000/-		1
5.	04/04/2018		रु.5,000/-	9 kg	2
6.	04/04/2018	ड्रायफुड्स, ज	रु.5,000/-	5kg	5
7.	04/04/2018	आविष्कार हार्डवेअर,	रु.5,000/-	5kg	3
8.	05/04/2018	न्यु मॉडर्न ब	रु.5,000/-	12 Kg	1
9.	05/04/2018	क्रॉप महोत्सव,नेहरु	रु.5,000/-	14 kg	2
10.	05/04/2018	क्रॉप महोत्सव,	रु.5,000/-		2
11.	05/04/2018	अब्दुल , जयस्तंभ	रु.5,000/-		2
12.	05/04/2018	प्रमोद	रु.5000/-	3kg	4
13.	06/04/2018	कॉस मे	रु.5,000/-	5 kg	1
14.	06/04/2018	मोडिकल्स	रु.5,000/-		1
15.	06/04/2018	न्यु संकल्प	रु.5,000/-		1
16.	06/04/2018		रु. 5,000/-	2kg	2
17.	06/04/2018	श्री.श्रीकांत मे	रु.5,000/-	2 kg	4
18.	06/04/2018	श्री.य	रु.5,000/-	2 kg	5
19.	07/04/2018	(गुन्हा)	रु.10,000/-	5 kg	5
20.	09/04/2018		रु.5,000/-	10 kg	1
21.	09/04/2018	अग्रवाल	रु.5,000/-	5 kg	4
22.	10/04/2018	करण्यात श	रु.5,000/-	15 kg	1
23.	10/04/2018	ब्रेड	रु.5,000/-	2 kg	2
24.	11/04/2018		रु.5,000/-	5kg	2
25.	11/04/2018		रु.5,000/-	4kg	1
26.	12/04/2018		रु.5,000/-	6 kg	2

27.	12/04/2018		रु. 5,000/-		2
28.	13/04/2018	लकी	रु. 5,000/-	10 kg	1
29.	13/04/2018		रु. 5,000/-		1
30.	13/04/2018		रु. 5,000/-	3 kg	3
31.	16/04/2018	श्री. श्रीकांत साहू	रु. 5,000/-	2 kg	3
32.	16/04/2018	.	रु. 5,000/-	20 kg	2
33.	16/04/2018		रु. 5,000/-		2
34.	16/04/2018	क्लब	रु. 5,000/-		2
35.	16/04/2018	क्लोथ	रु. 5,000/-		2
36.	16/04/2018	स्टोअर (गुन्हा)	रु. 10,000/-		2
37.	16/04/2018		रु. 5,000/-		2
38.	16/04/2018		रु. 5,000/-	8 kg	1
39.	16/04/2018		रु. 5,000/-		1
40.	16/04/2018	प्रोविजंस	रु. 5,000/-		1
41.	16/04/2018		रु. 5,000/-		1
42.	17/04/2018	न्यु प्रोविजन्स	रु. 5,000/-	3 kg	3
43.	17/04/2018		रु. 5,000/-	5 kg	5
44.	17/04/2018	हैण्डलम एक्साबिशन (गुन्हा)	रु. 10,000/-	8 kg	2
45.	19/04/2018	ग्रामोद्योग घी भंड	रु. 5,000/-	9 kg	2
46.	19/04/2018	प्रोविजन	रु. 5,000/-		2
47.	19/04/2018		रु. 5,000/-	3.5 kg	5
48.	19/04/2018		रु. 5,000/-	6 kg	1
49.	19/04/2018	-	रु. 5,000/-		1
50.	19/04/2018	राधेकृष्ण	रु. 5,000/-	2 kg	4
51.	20/04/2018	विषविशेस्वराय टेडसे	रु. 5,000/-	2 kg	5
52.	20/04/2018		रु. 5,000/-	2 kg	2
53.	20/04/2018	खत्री	रु. 5,000/-		2
54.	20/04/2018		रु. 5,000/-	6 kg	1
55.	20/04/2018	श्री. संस्कृती प्रोविजन	रु. 5,000/-		1
56.	21/04/2018	मुस्कान ड्रायफ्रुट्स	रु. 5,000/-	3 kg	1
57.	21/04/2018	श्री. † बलदेवप्रसाद गुप्ता	रु. 5,000/-	4 kg	5
58.	21/04/2018	कन्हैया प्लास्टिक (गुन्हा)	रु. 10,000/-	4 kg	2
59.	23/04/2018	प्रोविजन	रु. 5,000/-	3 kg	1
60.	23/04/2018	श्री. प्रदीप	रु. 5,000/-	1 kg	4

61.	23/04/2018		रु. 5,000/-	1 kg	3
62.	23/04/2018	प्लास्टिक	रु. 5,000/-	3 kg	2
63.	23/04/2018	मटेरियल	रु. 5,000/-	1 kg	5
64.	24/04/2018	वर्षा र सटर	रु. 5,000/-	1 kg	3
65.	24/04/2018	मामदे	रु. 5,000/-	1 kg	5
66.	24/04/2018	कल्याण टेर्डस	रु. 5,000/-	5 kg	2
67.	24/04/2018		रु. 5,000/-		2
68.	25/04/2018	प्रोव्हीजन	रु. 5,000/-	4 kg	1
69.	25/04/2018	प्रोव्हीजन	रु. 5,000/-		1
70.	26/04/2018	महालक्ष्मी प्रोव्हीजन	रु. 5,000/-	2 kg	1
71.	26/04/2018	()	रु. 5,000/-	2 kg	3
72.	26/04/2018	वृन्दावन	रु. 5,000/-	2 kg	2
73.	26/04/2018	रामचंद्र बसन्तवानी	रु. 5,000/-	2 kg	5
74.	27/04/2018	लक्ष्मी	रु. 5,000/-	2 kg	1
75.	27/04/2018	अग्रवाल प्रोव्हिजन	रु. 5,000/-	4 kg	3
76.	27/04/2018	आयुर्वेदिक र -	रु. 5,000/-		3
77.	02/05/2018		रु. 5,000/-	2 kg	5
78.	03/05/2018	प्रिया प्रोव्हिजन	रु. 5,000/-	5 kg	3
79.	03/05/2018		रु. 5,000/-	1 kg	5
80.	04/05/2018	स्वखला	रु. 5,000/-	1 kg	5
81.	05/05/2018	जयस्वाल	रु. 5,000/-	1 kg	3
82.	08/05/2018	मर्चेंट	रु. 5,000/-	2 kg	5
83.	08/05/2018	अग्रवाल	रु. 5,000/-	1 kg	3
84.	09/05/2018	विक्री दुका	रु. 5,000/-	1 kg	1
85.	10/05/2018	प्रोव्हिजन्स	रु. 5,000/-	2 kg	3
86.	10/05/2018	प्रोव्हिजन	रु. 5,000/-	2 kg	1
87.	11/05/2018	. .	रु. 5,000/-	1 kg	5
88.	14/05/2018	. .	रु. 5,000/-	1 kg	5
89.	14/05/2018	गुप्ता	रु. 5,000/-	3 kg	2
90.	15/05/2018		रु. 5,000/-	2 kg	3
91.	15/05/2018		रु. 5,000/-	4 kg	2
92.	15/05/2018	कोफी :	रु. 5,000/-		2
93.	17/05/2018	शुद्ध साम्रागी	रु. 5,000/-	2 kg	2
94.	21/05/2018	श्री कृष्ण	रु. 5,000/-	1 kg	1

95.	21/05/2018	स्वीट एन्ड नमकीन	रु. 5,000/-	1 kg	4
96.	22/05/2018	प्रोव्हिजन	रु. 5,000/-	1 kg	1
97.	22/05/2018	रुक्मिणी दूध	रु. 5,000/-	4 kg	3
98.	22/05/2018	ब्रदर्स	रु. 5,000/-		3
99.	22/05/2018	(विक्रेता)	रु. 5,000/-	1 kg	2
100.	23/05/2018	श्री माहुळकर (विक्रेता)	रु. 5,000/-	1 kg	2
101.	25/05/2018	आयन	रु. 5,000/-	1 kg	3
102.	25/05/2018	प्रगती झरोक्स स्टेनरी	रु. 5,000/-		3
103.	25/05/2018	स्पीड झरोक्स	रु. 5,000/-		3
104.	28/05/2018	आइस्क्रीम पालर	रु. 5,000/-	1 kg	3
105.	28/05/2018	मुगरिया	रु. 5,000/-	1 kg	5
106.	30/05/2018	श्री श	रु. 5,000/-	25 kg	1
107.	30/05/2018		रु. 5,000/-		1
108.	30/05/2018	श्री रू ()	रु. 5,000/-	15 kg	2
109.	31/05/2018	तिरुपती अ स्क्रिम	रु. 5,000/-	1 kg	1
110.	01/06/2018	करिया	रु. 5,000/-	1 kg	5
111.	02/06/2018		रु. 5,000/-	1 kg	2
112.	23/06/2018	गुप्ता सिमेंट हाउ	रु. 5,000/-	4 kg	3
113.	23/06/2018	सरस्वती मिल्क	रु. 5,000/-		3
114.	23/06/2018	पटेरिया	रु. 5,000/-	1 kg	5
115.	23/06/2018	प्रोव्हिजन्स	रु. 5,000/-	5 kg	4
116.	23/06/2018	स्टोअर्स	रु. 5,000/-	40 kg	1 & 2
117.	23/06/2018	श्री कल्याण ट्रेडर्स (गुन्हा)	रु. 10,000/-		1 & 2
118.	23/06/2018		रु. 5,000/-		1 & 2
119.	23/06/2018		रु. 5,000/-		1 & 2
120.	24/06/2018	प्रसाद	रु. 5,000/-	1 kg	2
121.	25/06/2018	श्री.री	रु. 5,000/-	3 kg	4
122.	25/06/2018	श्री.के. इंटरप्राइजेन्	रु. 5,000/-		4
123.	25/06/2018	इंटरप्राईस	रु. 5,000/-	256 kg	2
124.	26/06/2018		रु. 5,000/-	1 kg	1
125.	27/06/2018		रु. 5,000/-	1 kg	1
126.	27/06/2018	स्टोर्स	रु. 5,000/-	1 kg	4
127.	28/06/2018		रु. 5,000/-	3 kg	1
128.	28/06/2018	आस्था	रु. 5,000/-		1

129.	28/06/2018		रु. 5,000/-		1
130.	04/07/2018	आइसक्रीम	रु. 5,000/-	1 kg	4
131.	04/07/2018	7 PM	रु. 5,000/-	1 kg	4
132.	14/07/2018	श्री अ	रु. 5,000/-	2 kg	2
133.	14/07/2018	श्री सु	रु. 5,000/-		
134.	25/07/2018		रु. 5,000/-	1 kg	5
135.	31/08/2018		रु. 5,000/-	9 kg	3
136.	31/08/2018		रु. 5,000/-		3
137.	01/09/2018	व्यापारी	रु. 5,000/-	2 kg	1
138.	06/09/2018	व्यापारी	रु. 5,000/-	1 kg	2
139.	06/09/2018	व्यापारी	रु. 5,000/-	1 kg	2
140.	06/09/2018	श्री. नरेद्र ब	रु. 5,000/-	1 kg	5
141.	07/09/2018	व्यापारी	रु. 5,000/-	8 kg	2
142.	07/09/2018	श्री. f	रु. 5,000/-	1 kg	5
143.	03/10/2018	बहुराणी क्लोथ	रु. 5,000/-	200 kg	महाराष्ट्र
144.	03/10/2018	क्लोथ	रु. 5,000/-		प्रदूषण
145.	03/10/2018		रु. 5,000/-		
146.	05/10/2018	कॉनर	रु. 5,000/-	1 kg	1
147.	05/10/2018	नम्रता स्वीट ()	रु. 5,000/-	1 kg	1
148.	06/10/2018	ज्वेलरी	रु. 5,000/-		महाराष्ट्र
149.	06/10/2018	लक्ष्मी श्रृंगार	रु. 5,000/-		प्रदूषण
150.	06/10/2018		रु. 5,000/-		
151.	06/10/2018	वधमान इ	रु. 5,000/-		
152.	06/10/2018	हरिकृष्ण स्टोर	रु. 5,000/-		
153.	06/10/2018		रु. 5,000/-		
154.	06/10/2018		रु. 5,000/-		
155.	06/10/2018		रु. 5,000/-		
156.	06/10/2018	ssd कलेक्शन	रु. 5,000/-		
157.	09/10/2018	-मार्ट ग	रु. 5,000/-	-	महाराष्ट्र
158.	09/10/2018	व्हॉलमार्ट	रु. 5,000/-	-	प्रदूषण
159.	09/10/2018	-मार्ट केम्प	रु. 5,000/-	-	
160.	10/10/2018	गोल्डन	रु. 5,000/-	5 kg	महाराष्ट्र
161.	10/10/2018	गाडेन अँड रेस्टारेंट	रु. 5,000/-		प्रदूषण
162.	10/10/2018	लॉड्स अँड रेस्टारेंट	रु. 5,000/-		

163.	10/10/2018	गोल्डन आर्क हॉर्टिकल्स	रु. 5,000/-		4
164.	10/10/2018		रु. 5,000/-		
165.	10/10/2018	कृष्णा	रु. 5,000/-		
166.	11/10/2018	श्री अ	रु. 5,000/-	30 kg	महाराष्ट्र प्रदूषण
167.	11/10/2018		रु. 5,000/-		
168.	11/10/2018	कैन्हाय्या	रु. 5,000/-		
169.	11/10/2018	सुष्टी	रु. 5,000/-		5
170.	15/10/2018	जनकशन	रु. 5,000/-	8 kg	महाराष्ट्र प्रदूषण
171.	15/10/2018	सेल्स	रु. 5,000/-		
172.	15/10/2018	स्टोअर्स	रु. 5,000/-		
173.	15/10/2018	दुल्हा	रु. 5,000/-		3
174.	17/10/2018	शिवशक्ति फि, कृष्णा	रु. 5,000/-	2 kg	1
175.	17/10/2018		रु. 10,000/-		1
176.	22/10/2018	प्लास्टिक इंडस्ट्रीज	रु. 10,000/-	2 kg	5
177.	25/10/2018		रु. 5,000/-	1 kg	2
178.	25/10/2018	श्री. दुर्गा ते	रु. 5,000/-		2
179.	26/10/2018	श्री मे	रु. 5,000/-	8 kg	3
180.	26/10/2018	प्रोविजन	रु. 5,000/-		3
181.	29/10/2018	श्री.अ क्षिरसागर,अ ट्रेडर्स	रु. 5,000/-	30 kg	4
182.	29/10/2018	श्री.रा , मेटेरियल	रु. 5,000/-		4
183.	29/10/2018	श्री.सं मेटेरियल	रु. 5,000/-		4
184.	29/10/2018	श्री.प्रणव दत्तात्रय ज ,	रु. 5,000/-		4
185.	30/10/2018	अलकरिम रेस्टॉरंट	रु. 5,000/-	14 kg	5
186.	30/10/2018	स्टोअर्स	रु. 5,000/-		5
187.	30/10/2018	रेस्टॉरंट	रु. 5,000/-		5
188.	30/10/2018		रु. 5,000/-		5
189.	30/10/2018		रु. 5,000/-		5
190.	30/10/2018	रेस्टॉरंट	रु. 5,000/-		5
191.	30/10/2018	. .	रु. 5,000/-		5
192.	31/10/2018	स्टोअर्स	रु. 5,000/-	15 kg	1
193.	31/10/2018	केंद्र	रु. 5,000/-		1
194.	31/10/2018	गायत्री केंद्र	रु. 5,000/-		1
195.	31/10/2018	व्यंकटेश केंद्र	रु. 5,000/-		1
196.	31/10/2018		रु. 5,000/-		1

197.	31/10/2018	इन्टरप्राइजेस	रु. 5,000/-		1
198.	31/10/2018	तिरुपती वृ. केंद्र	रु. 5,000/-		1
199.	17/11/2018	पेकिंग	रु. 5,000/-	27 kg	5
200.	17/11/2018	मार्केटींग	रु. 5,000/-		5
201.	19/11/2018	चिप्स	रु. 5,000/-	9 kg	1
202.	19/11/2018		रु. 10,000/-		1
203.	27/11/2018	न्यु	रु. 5,000/-	7 kg	5
204.	27/11/2018	ऑप्टिकल	रु. 5,000/-		5
205.	29/11/2018	जयस्तंभ माकेट	रु. 10,000/-	137 kg	2
206.	30/11/2018	-	रु. 5,000/-		3
207.	30/11/2018	एकेन्डो	रु. 5,000/-	64 kg	3
208.	30/11/2018	श्री ब	रु. 5,000/-		3
209.	30/11/2018		रु. 5,000/-		3
210.	30/11/2018	एण्ड	रु. 5,000/-		3
211.	03/12/2018		रु. 5,000/-	3 kg	5
212.	10/12/2018	सेंटर	रु. 5,000/-	15 kg	5
213.	11/12/2018		रु. 5,000/-	7 kg	1
214.	11/12/2018		रु. 5,000/-		1
215.	12/12/2018		रु. 5,000/-	30 kg	2
216.	12/12/2018	इलेक्ट्रीकल्स	रु. 5,000/-		2
217.	12/12/2018	स्टोर	रु. 5,000/-		2
218.	12/12/2018	स्ट्रीट	रु. 5,000/-		2
219.	13/12/2018	सरस्वती	रु. 5,000/-	2 kg	3
220.	13/12/2018	वस्त्रालय	रु. 5,000/-		3
221.	14/12/2018	ट्रेडर्स	रु. 5,000/-	2 kg	4
222.	14/12/2018		रु. 5,000/-		4
223.	15/12/2018	खत्री	रु. 5,000/-	4 kg	5
224.	15/12/2018		रु. 5,000/-		5
225.	24/12/2018	एग्रो सेंटर	रु. 5,000/-	1 kg	1
226.	28/12/2018	वही.	रु. 5,000/-	1 kg	4
227.	29/12/2018		रु. 5,000/-	6 kg	5
228.	29/12/2018		रु. 5,000/-		5
229.	31/12/2018	. आइस्क्रीम & डे	रु. 5,000/-	1 kg	1

230.	07/01/2019	Wine Gallery	रु. 5,000/-	1 kg	4
231.	08/01/2019		रु. 5,000/-	27 kg	5
232.	08/01/2019	रूची गिफ्ट	रु. 5,000/-		5
233.	08/01/2019	श्रद्धा स्टेशनरी	रु. 5,000/-		5
234.	08/01/2019	श्री ल	रु. 5,000/-		5
235.	09/01/2019	चंद्रलोक	रु. 5,000/-	6 kg	1
236.	09/01/2019	सेंटर	रु. 5,000/-		1
237.	09/01/2019		रु. 5,000/-		1
238.	09/01/2019		रु. 5,000/-		1
239.	09/01/2019	EO	रु. 5,000/-		1
240.	11/01/2019	अॅन्ड	रु. 5,000/-	3 kg	3
241.	11/01/2019		रु. 5,000/-		3
242.	14/01/2019	अग्रवाल	रु. 5,000/-	7 kg	4
243.	14/01/2019	इलेक्ट्रीकल	रु. 5,000/-		4
244.	15/01/2019	परफेक्ट	रु. 5,000/-	1590 kg	5
245.	15/01/2019	ट्रान्सपोर्ट	रु. 5,000/-		5
246.	15/01/2019	महाराष्ट्र ट्रान्सपोर्ट	रु. 5,000/-		5
247.	16/01/2019	आदर्श ह	रु. 5,000/-	8 kg	1
248.	16/01/2019	ड्रेसेस	रु. 5,000/-		1
249.	16/01/2019		रु. 5,000/-		1
250.	17/01/2019	ज्वेलर्स	रु. 5,000/-	2 kg	2
251.	17/01/2019		रु. 5,000/-		2
252.	17/01/2019	स्टोअर	रु. 5,000/-		2
253.	18/01/2019	इलेमेंट	रु. 5,000/-	2 kg	3
254.	19/01/2019	कलेक्शन	रु. 5,000/-	2 kg	4
255.	19/01/2019	ग्रेन्स	रु. 5,000/-		4
256.	19/01/2019		रु. 5,000/-		4
257.	21/01/2019	ड्रेस मी	रु. 5,000/-	6 kg	5
258.	21/01/2019		रु. 5,000/-		5
259.	21/01/2019	अर्चिता पे	रु. 5,000/-		5
260.	21/01/2019	प्रकाश ड्रेसर्स	रु. 5,000/-		5
261.	22/01/2019	रिजनरेशन	रु. 5,000/-	3 kg	1
262.	22/01/2019	ब्यूटी	रु. 5,000/-		1
263.	22/01/2019	बत्रा	रु. 5,000/-		1

264.	23/01/2019	अप्सरा ड्रेस	रु. 5,000/-	15 kg	2
265.	23/01/2019		रु. 5,000/-		2
266.	23/01/2019	अनिरुध् ड्रेस	रु. 5,000/-		2
267.	24/01/2019	इंटरप्राइजेस	रु. 5,000/-	1 kg	3
268.	25/01/2019	ट्रेडर्स	रु. 5,000/-	5 kg	4
269.	29/01/2019	टेंट एं कैटरिंग स्टोर	रु. 5,000/-	4 kg	1
270.	11/02/2019	डिम्पल वा	रु. 5,000/-	1 kg	4
271.	12/02/2019		रु. 5,000/-	1 kg	5
272.	12/02/2019	सार्थी	रु. 5,000/-		5
273.	12/02/2019	मन्नत	रु. 5,000/-		5
274.	12/02/2019		रु. 5,000/-		5
275.	13/02/2019	स्टेशनरी अॅन्ड कॉस्मेटिक	रु. 5,000/-	1 kg	1
276.	13/02/2019		रु. 5,000/-		1
277.	13/02/2019		रु. 5,000/-		1
278.	20/02/2019		रु. 5,000/-	1 kg	1
279.	20/02/2019		रु. 5,000/-		1
280.	20/02/2019	जिम्मी दा	रु. 5,000/-		1
281.	20/02/2019	गुरुमुखदास	रु. 5,000/-		1
282.	08/03/2019	ट्युटोरियल एन्ड मार्केटिंग	रु. 5,000/-	1 kg	3
283.	11/03/2019		रु. 5,000/-	1 kg	4
284.	14/03/2019	.	रु. 5,000/-	2 kg	2
285.	14/03/2019	.	रु. 5,000/-		2
286.	14/03/2019	उपाध्याय	रु. 5,000/-		2
287.	14/03/2019	ट्रेडर्स	रु. 5,000/-		2
288.	18/03/2019		रु. 5,000/-	1 kg	5
289.	06/05/2019	महाराष्ट्र	रु. 5,000/-	3 kg	1
290.	06/05/2019	श्रीहरी डे	रु. 5,000/-		1
291.	06/05/2019	गुप्ता सेंटर	रु. 5,000/-		1
292.	08/05/2019	साडीसेंटर	रु. 5,000/-	4 kg	2
293.	08/05/2019	कलेक्शन	रु. 5,000/-		2
294.	08/05/2019	प्रिया कलेक्शन	रु. 5,000/-		2
295.	08/05/2019	क्लॉथ स्टोर	रु. 10,000/-		2
			रु. 15,25,000/-	3078 kg	