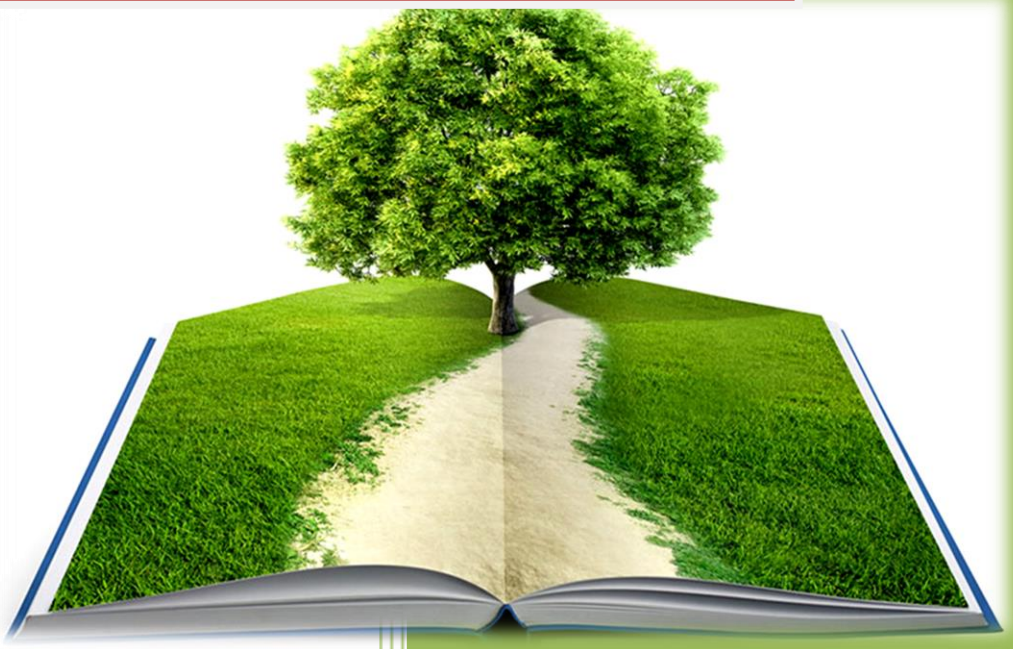
YCCE
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Environmental Audit Report 2017-18

Yeshwantrao Chavan College of Engineering, Nagpur



GLOBAL SCIENTIFIC INC.

Report by:
Global Scientific Inc.
Nagpur

GLOBAL SCIENTIFIC INC.

ISO 9001:2015

Asidham,Opp Gomti Appartment W.H.C Road, Law College Square ,Nagpur

ENVIRONMENTAL AUDIT CERTIFICATE

This Certificate has been awarded to

Yeshwantrao Chavan College of Engineering

Hingna Rd ,Wanadongri ,Nagpur ,Maharashtra

for 2017-2018

In Recognition of the Organization Efforts for Sustainable Management and compliance of Environmental Audit and maintenance of the Institution.

Dr. Anagha Patil
Team Lead
Global Scientific Inc.

Dr. Smeeta Bhabra
Director
Global Scientific Inc.

Ms. Aishwarya Deshmukh
Lead Auditor-TUV Nord
Global Scientific Inc.
Cert. No: 35273988 14

Certificate of Registration

ISO 9001:2015

This is to Certify that
Quality Management System of

GLOBAL SCIENTIFIC INC.

ASIDHAM, OPPOSITE GOMTI APARTMENTS, WHC ROAD, LAW COLLEGE SQUARE, NAGPUR – 440 010 (MAHARASHTRA) (INDIA)

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVISION FOR ENVIRONMENTAL CONSULTANCY SERVICE, OPERATION & MAINTENANCE, DESIGN , CONSTRUCTION OF SEWAGE TREATMENT PLANT, EFFLUENT TREATMENT PLANTS, WATER TREATMENT PLANT, ENVIRONMENTAL STATUS REPORTS, HOUSE KEEPING AND MECHANIZED CLEANING OF INFRASTRUCTURES LIKE INDUSTRIES AND MUNICIPAL SERVICE, LAKE REJUVENATION PROJECTS, ANTITHETICAL LABORATORY FOR TESTING OF WATER , AIR, WASTE WATER, NOISE & SOIL

Certificate No	**18IQBJ03**		
Initial Registration Date	: 20/01/2018	Issuance Date	: 20/01/2018
Date of Expiry*	: 19/01/2021		
1st Surve. Due	: 20/12/2018	2nd Surve. Due	: 20/12/2019

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Certificate

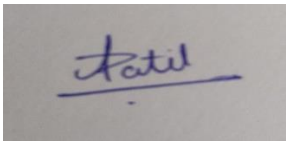
This is to certify that a **"Environmental Audit"** for Yeshwantrao Chavan College of Engineering, Hingna Nagpur has been conducted in 2018 to assess the Environmental Components: Water, Air, Soil, Weather and Climate, Vegetation and Fauna, Sound Level, Energy, Waste- Institutional municipal solid Waste and Wastewater and the Eco-friendly initiatives implemented within the college campus.

Place: Nagpur

Date: 24/11/2018

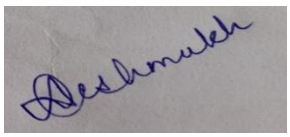
Dr. Smeeta Bhabra

Director
Global Scientific Inc.



Dr. Anagha Patil

Team Lead
Global Scientific Inc.



Ms. Aishwarya Deshmukh

Lead Auditor-TUV Nord
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Audit Team

1) Dr. Smeeta Bhabra (Head)
2) Dr. Anagha Patil (Team Lead)
3) Ms. Aishwarya Deshmukh (Certified Auditor)
4) Ms. Samruddhi Metangley (Co-ordinator)
5) Ms. Sukhada Nagpure (GIS Analyst)
6) Ms. Tejashree Padwe (Data Processing Assistant)

Data Collection Team

1) Ms. Shivani Deshmukh
2) Ms. Tanushree Mendhe
3) Mr. Nilesh Jibhkate
4) Ms. Nisha Bihare
5) Ms. Jayashree Kale

Contents

Introduction

Yeshwantrao Chavan College of Engineering, Nagpur is established in the year 1984. It is named in the memory of Late Shri. Yeshwantrao Chavan, the Great Patriot who was first Chief Minister of Maharashtra and the former Deputy Prime Minister of India.

YCCE is one of the premier college of Engineering in the Vidarbha region of Maharashtra. The goal of Institution is to provide excellent educational environment to the students at both undergraduate and postgraduate levels. The institute extends its expertise in engineering and technological requirements to various public and private sector organizations. The institute aims to transform students into responsible and resourceful leaders in their profession.

The college is becoming a most sought after destination by the students who are aspiring to pursue higher technical education and attain placements in the competitive software and core industries. The institution accentuates on instilling significant professional education for crafting ambitious engineers who would ultimately possess noteworthy qualities to become leaders in their opted profession. The highly educated and well-experienced faculty members focus on inculcating excellent education for creating commendable engineers.

The infrastructure and the atmosphere of the institute are completely oriented towards boosting the substantial teaching-learning schema promoting the development of students' attentiveness towards learning. These factors have ultimately made YCCE as the most ideal and preferred **engineering college in Central India**. The institute is awarded with **'A' Grade** of by **National Assessment and Accreditation Council (NAAC)** for a period of five years 2016-2021.

The Yeshwantrao Chavan College of Engineering, Nagpur is geographically located about at 21.096742 latitutde and 78.979402 longitude and is 14.7 Km from Nagpur airport and railway station, on the Nagpur Hingna road. The college campus is located on a lush green hill top area and is benefitted with the elevation from adjacent street pollution which leads to reduced air pollution in the college premises which was a barren land 39 yars back.

College Address

Yeshwantrao Chavan College of Engineering Hingna Road, Wanadongri, Nagpur- 441110	
State	Maharashtra
Phone	+91-7104-295083, 295085
Phone (Principal office)	+91-7104-295083, 09764996477
Fax	+91-7104-242376
Hostel	+91-7104-242840
Website	www.ycce.edu
Email	principal@ycce.edu , info@ycce.edu

About College

- The college is guided by the Academic Advisory Board consisting of eminent academicians from the prestigious technical institutes in India and USA. The college is having well qualified blend of experienced senior faculty members and the young faculties as well.
- Yeshwantrao Chavan College of Engineering (YCCE) is renowned for Engineering Education and Research. For over 36 years, it has successfully nurtured young engineering professionals, becoming a sought-after destination for students aspiring to higher technical education and placement in the competitive software and core industries. It offers a rare combination of respected scholars, international footprint and interdisciplinary studies
- A premier institute, YCCE became one of the few selected well-performing colleges for Government of India's Technical Education Quality Improvement Program (TEQIP Phase I), funded by the World Bank. With the TEQIP financial aid, the Institution has created state-of-the-art infrastructure, laboratories, computational facilities, library etc
- YCCE has become the First private engineering college to acquire 'Autonomous' status in Central India. Under the new status, the first batch of students commenced their B.E. and M.Tech. Courses from the academic session 2010-2011. In the year 2016-17, UGC peer team visited YCCE & granted ‘Extension of Autonomy’ for 6 years (2016-2022).
- Quality assurance through Accreditation and Re-Accreditation of UG & PG programs done by National Board of Accreditation (NBA), New Delhi Since 2003
- Accreditation with ‘A’ Grade by UGC National Assessment and Accreditation Council (NAAC), Bangalore
- Received ISTE National Award 2014 for being the “Best Private Engineering College” in the Country.
- Awarded 'A' Grade by the Government of Maharashtra in the year 2002-2003.
    - Innovation Gallery for displaying innovative UG/PG project work of students
    - Accreditation by repeated corporates/industries like TCS, Capgemini, Wipro etc. for enhancing student’s placement and internship.

Visionary

Hon'ble Shri Dattaji Meghe is the architect of **Nagar Yuwak Shikshan Santha, Nagpur**. He has been the guiding star in spreading the light of education. His can-do-more attitude brought about an intellectual revolution that has transformed the social, educational, economic and cultural life of rural Maharashtra.

One lamp that lit strongly and firmly with a great vision of spreading the light of wisdom is our Hon'ble Shri Dattaji Meghe the Chairman of Nagar Yuwak Shikshan Sanstha & Founder Chancellor of Datta Meghe Institute of Medical Sciences University is in active public life for more than 35 years. He represented the people of Maharashtra in Lok Sabha for 3 consecutive terms & was the Member of Parliament (Rajya Sabha).

He strongly believed that quality Education & Health can only bring the true transformation of the huge human resources of our nation.

In pursuit of Chairman of YCCE social commitment, a modest beginning was made by starting a small educational institute **36** years ago, which has grown up into an educational empire covering almost all faculties of education spread all over Maharashtra state.

This educational society has established **27** institutions right from pre-primary to postgraduate levels covering various faculties like Medical Sciences, Pharmacy, Engineering, Social Science, Commerce, Science, Physical Education and Performing Arts. The Society is like a giant join-family of about **30000** students and about **1500** highly educated and skilled staff. Our founder Chairman Shri. Dattaji Meghe insists on good quality education, discipline and welfare of the students and the staff.

All these institutions are provided with highly qualified and well trained staff, well equipped laboratories, spacious libraries, playgrounds, canteens and buses for transportation of students and staff. The performances of the students in examinations are always excellent. It is profound desire and ardent endeavor of our founder to evolve an educational process involving modern technology and knowledge with preservation of our cultural heritage.

YCCE stands by its motto of becoming a leader in imparting quality education and training in engineering. It also contributes to the ever-expanding knowledge and skills in the professional

environment through scientific inquiry, applied research and innovation to play a vital role in socio economic progress. The management and faculty are fully committed to generate excellence in academics and to attain the sacred goal of making the students realize their full potential in all dimensions of their personality.

Leadership

This quote very well goes with our young and dynamic leaders Shri. Sagar Meghe and Shri. Sameer Meghe, who were empowered with knowledge and inspired by a tradition of accomplishment have with their focused expertise, far-reaching vision and strong commitment to humanity have given the new height to YCCE. This in turn is creating students, scholars and technocrats who in turn are contributing meaningfully to the service of mankind and the profession.

Under their great leadership, YCCE students learn not only to navigate and translate the engineering sciences in the classroom and laboratories but also to apply their developing knowledge and understanding in practical engineering applications in innovative ways.

Vision

To become the most preferred institution providing innovative research and value based, professional education for the society at large.

Mission

YCCE is committed to:

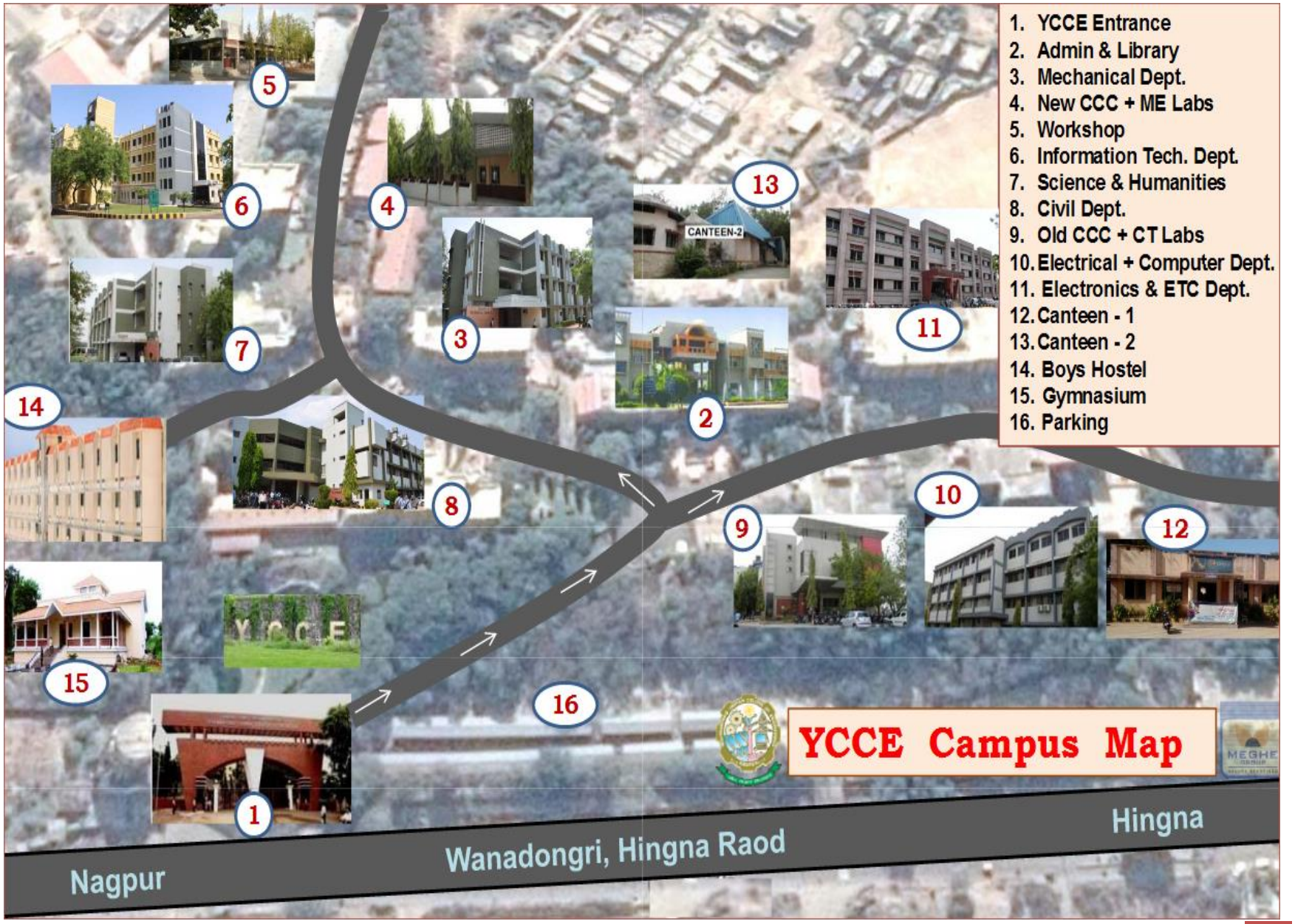
- Attract best talent and create best learning ambience
- Practice-innovative teaching-learning & research
- Integrate Industry-Institute Collaborations
- Nurture students towards holistic development and choicest careers

Objectives of Environmental Audit:

The main aim objectives of this Environmental Audit are to assess the environmental quality and the management strategies being implemented in Yeshwantrao Chavan College of Engineering, Nagpur.

The specific objectives are:

1) To assess the quality of the Water Component and Soil Component in the YCCE college campus.
2) To track the Weather & Climate parameters around the campus and monitor Ambient Air Quality parameters of YCCE.
3) To monitor the Energy Consumption pattern (Electricity & Solar Energy) of the college.
4) To quantify the Solid Waste Generation and Management Plans in the YCCE campus.
5) To assess the Carbon footprint potential drawn Electricity and Solar Energy Consumption of the college.
6) To identify the gap areas and suggest recommendations to improve the Green Campus status of the Yeshwantrao Chavan College of Engineering, Nagpur.


1. YCCE Entrance
2. Admin & Library
3. Mechanical Dept.
4. New CCC + ME Labs
5. Workshop
6. Information Tech. Dept.
7. Science & Humanities
8. Civil Dept.
9. Old CCC + CT Labs
10. Electrical + Computer Dept.
11. Electronics & ETC Dept.
12. Canteen - 1
13. Canteen - 2
14. Boys Hostel
15. Gymnasium
16. Parking
CANTEEN-2
Y C C E
YCCE Campus Map
Nagpur
Wanadongri, Hingna Raod
Hingna

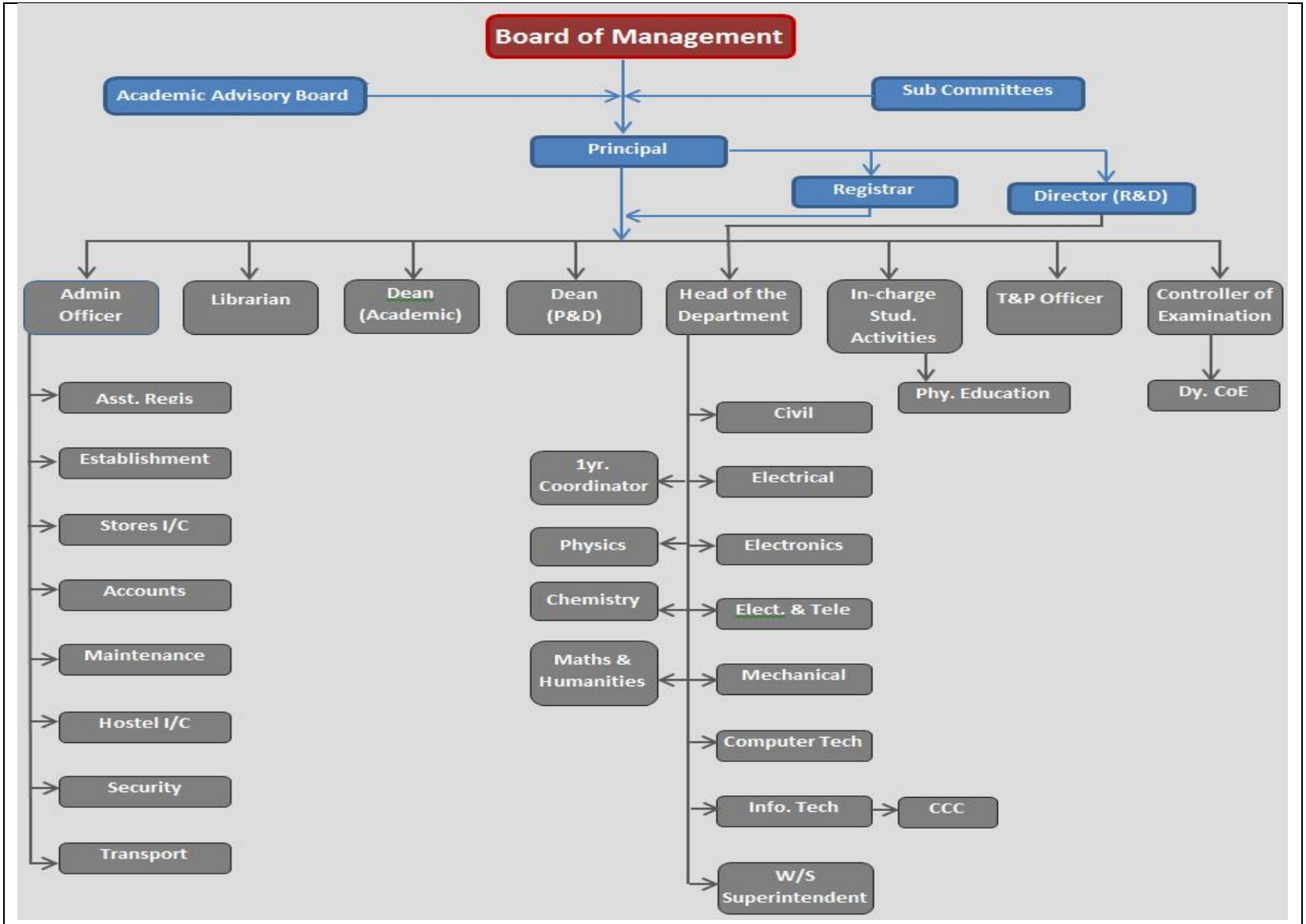
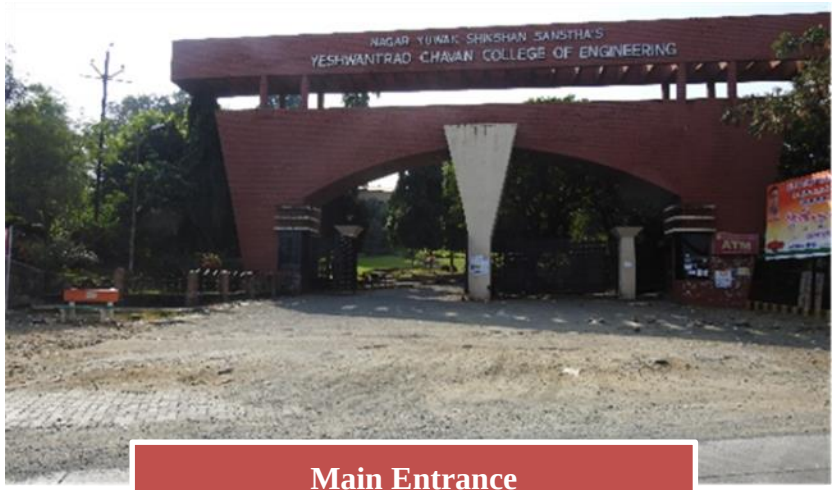
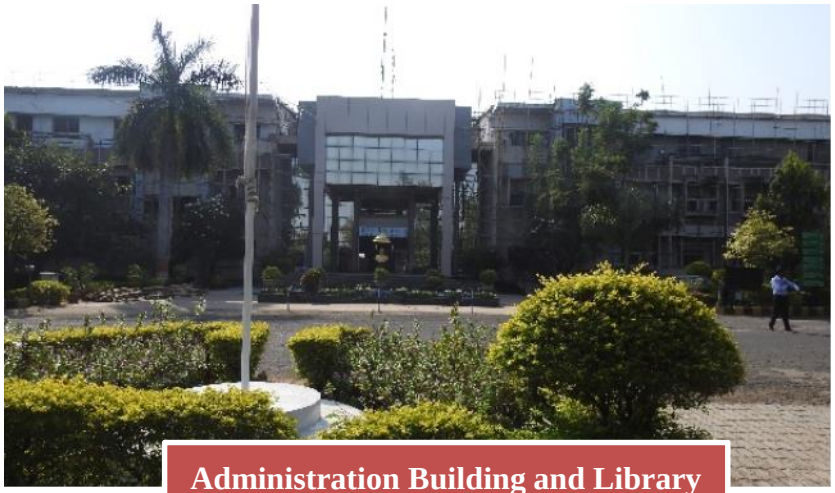


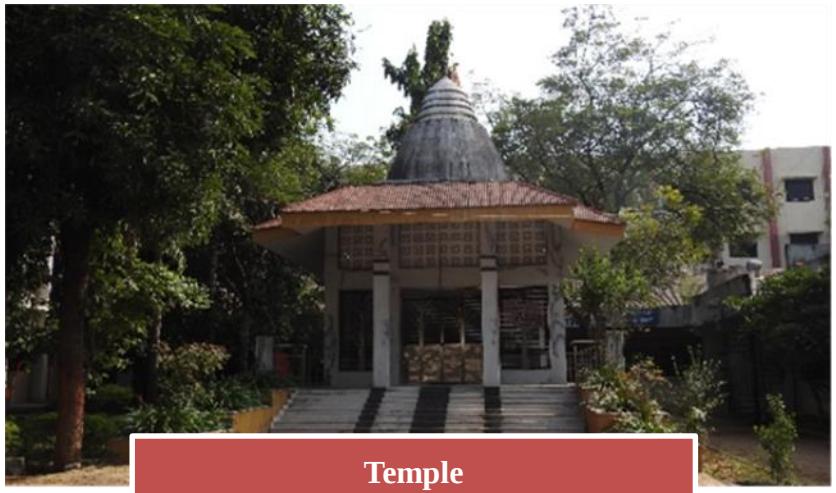
Image No. 1: Organization Structure of YCCE



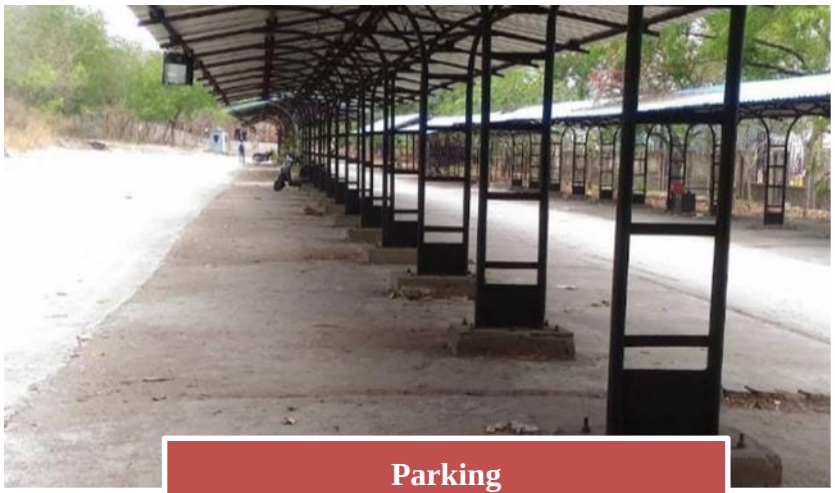
Main Entrance



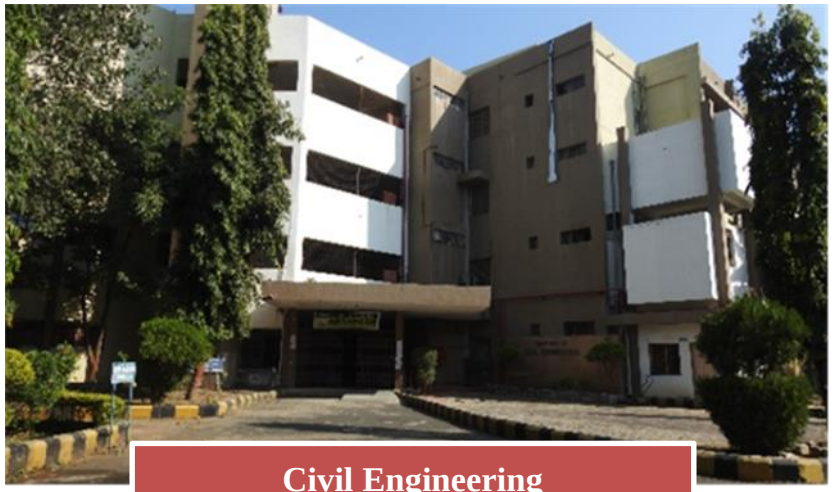
Administration Building and Library



Temple



Parking

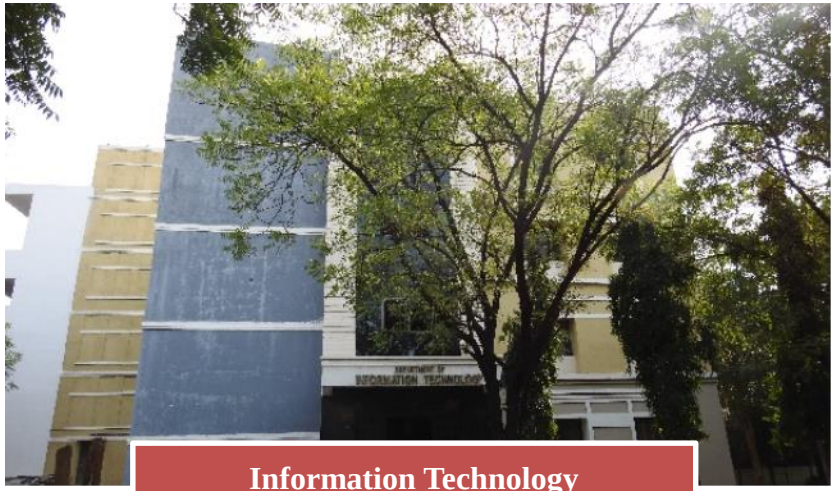


Civil Engineering

Workshop (Civil)

Mechanical Engineering

Electronics and Telecommunication



Information Technology

Old CCC+Computer Technology Labs

New CCC+Mechanical Engineering Labs

Workshop

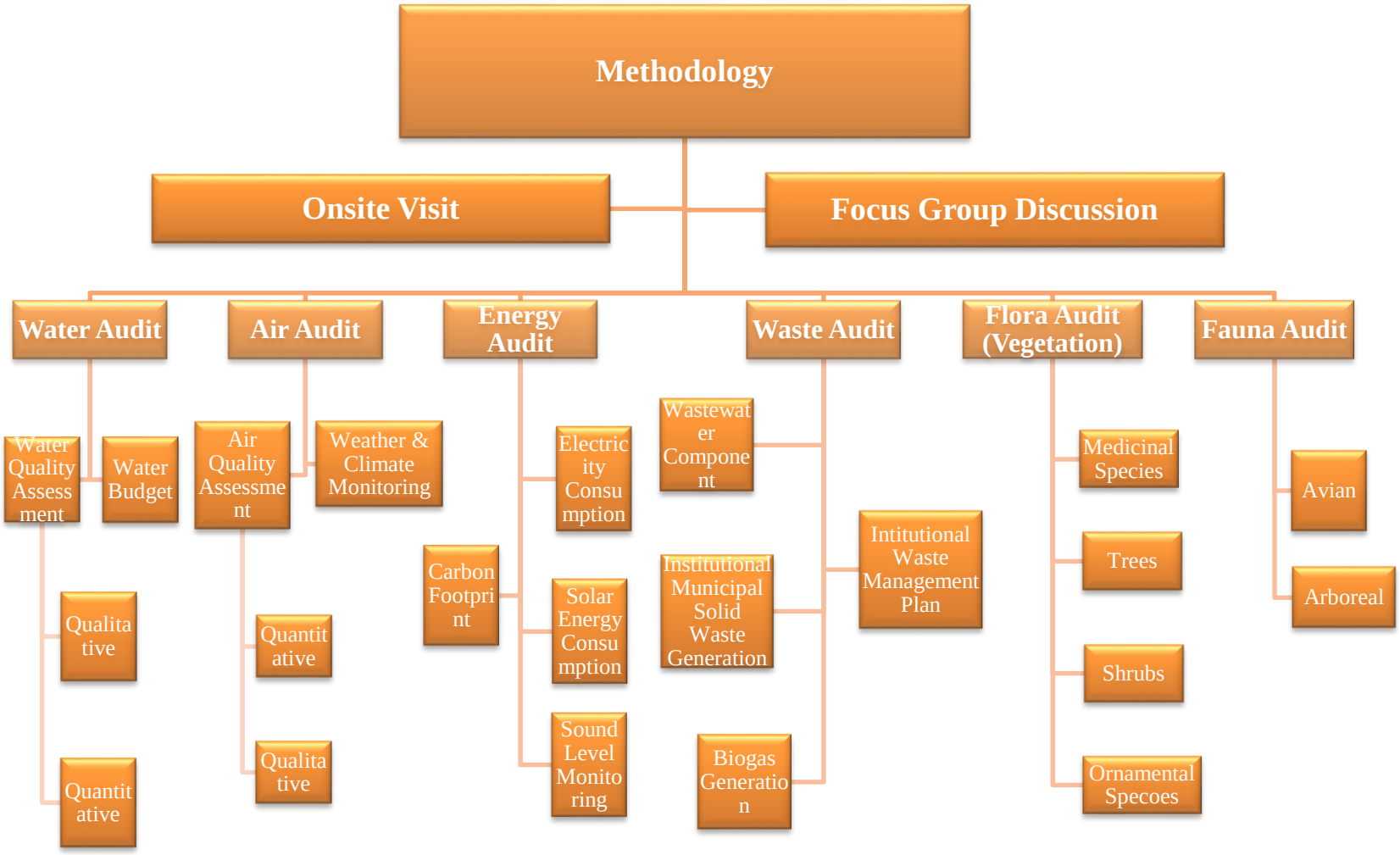
Computer Technology and Electrical Engineering

Applied Science and Humanities

Canteen 1

Stationary & Maintenance Department

Image No: 2: Study Methodology adopted to conduct the Green Audit of the Institution



Campus Area	:	14 Acres
Location	:	On a hill top, lush green environment with picturesque settings, on Nagpur-Hingna Road.
Accessibility	:	15 Kms from Nagpur Railway station and 14 Kms from Airport.

Area segments: Total Built-up and Green Area

Table No .1: Details of Total Built-up and Green Area

Sr. No.	Description	Area
1)	Campus Area	56,656 sq. m
2)	Built-up Area	37,702.76 sq. m
3)	Vegetation Cover	13,359 sq. m
4)	Parking + Roads	14,307 sq. m

Table No .2: Department wise built-up Area

Sr. No.	Name of Department Building	Floors	Built-up Area (Sq.m)
1	Administrative & Library Building	G+3	4146.054
2	Civil Building	G+3	3619.668
3	Civil Lab Shed	G.F.	513.86
4	Electrical Building	G+3	5229.631
5	Mechanical Building	G+3	3229.63
6	Mechanical Lab Shed	G.F.	1253.736
7	Workshop Shed	G.F.	1403.56
8	Science Building	G+3	3410.754
9	Electronics Building	L. G.F.+ G + 2	6818.75
10	Central Computer Centre Building	G+1	1094.784
11	IT Building	G+3	2977.811
12	Canteen-I	G.F.	241.041
13	Canteen - II	G.F.	298.084
14	Exam Control Building	G+1	1250.412
15	College Building (Block-T)	G+3	2214.985
Total Built- up Area			**37702.76**

Satellite Imagery No. 1: Builtup Area of YCCE Campus

Table No .3 : Details of Infrastructure

Sr. No.	Description	Nos.
1)	Total Classroom	76
2)	Total Tutorial rooms	
3)	Total Labs	92
4)	Drawing Hall	3
5)	Workshop	5
6)	Seminar Hall	7
7)	Computer Centre	5
8)	Innovation Lab	3

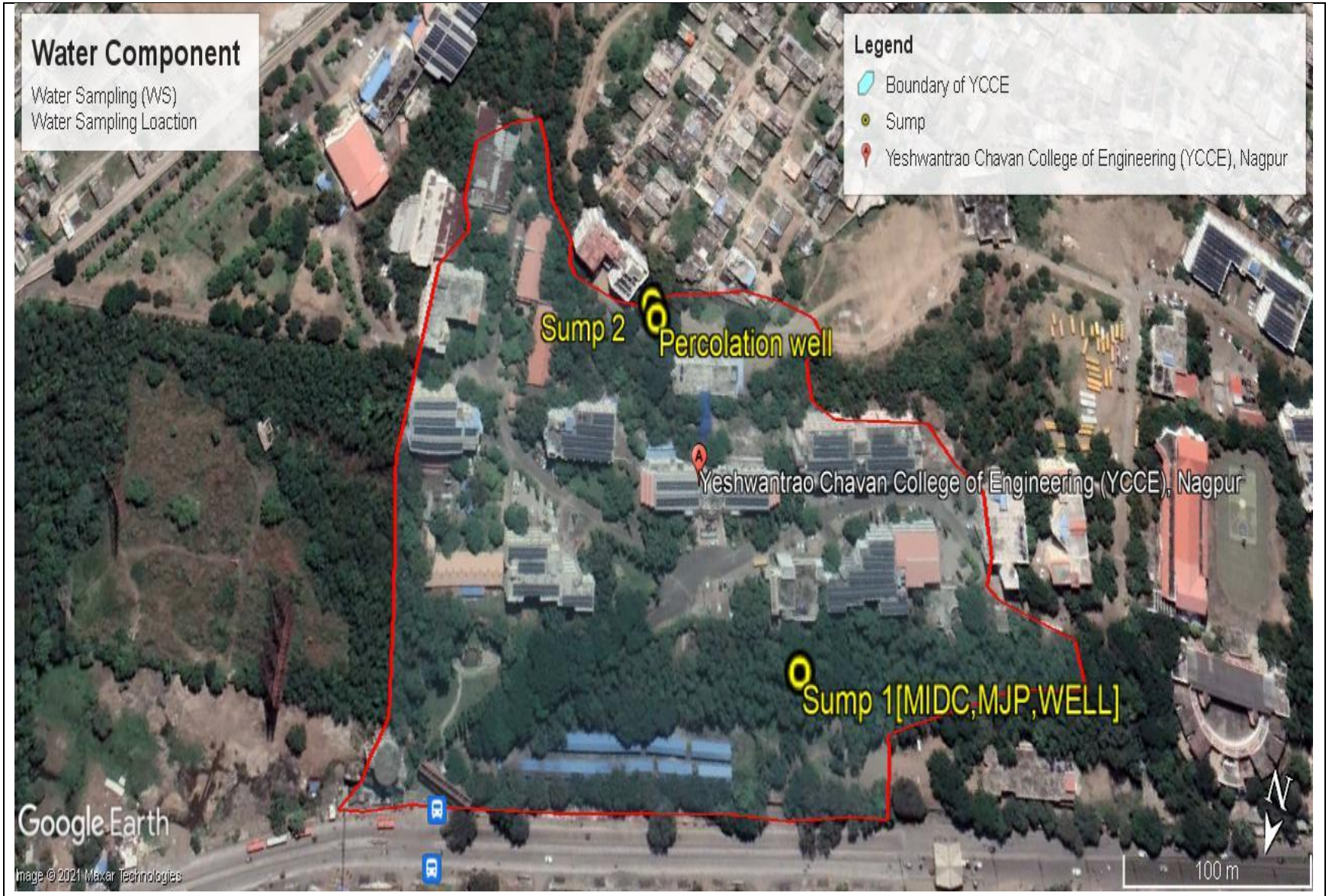
I] Water Audit

Water plays a significant role in maintaining the human health and welfare. Clean drinking water is now recognized as a fundamental right of human beings. Around 780 million people do not have access to clean and safe water and around 2.5 billion people do not have proper sanitation. As a result, around 6–8 million people die each year due to water related diseases and disasters. In the today world, the water use in household supplies, public supplies is commonly defined as domestic water. This water is processed to be safely consumed as drinking water and other purposes.

The major Drinking water sources at YCCE are:

1) Maharashtra Jeevan Pradhikaran (MJP)
2) Maharashtra Industrial Development Corporation (MIDC)
3) Groundwater Well
4) Borewell-2 Nos.

The water sample was collected by purposive sampling method from common sump and subjected for the physico-chemical and biological characterization for qualitative and quantitative estimation of water within the campus.



Satellite Imagery No. 1: Water sources within YCCE

Indian Standard DRINKING WATER — SPECIFICATION

Table No.4: Organoleptic and Physical Parameters

(*Foreword* and *Clause* 4)

Sr. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Remarks
i)	Colour, Hazen units, *Max*	5	15	Extended to 15 only, if toxic substances are not suspected in absence of alter- nate sources a) Test cold and when heated
ii)	Odour	Agreeable	Agreeable	—
iii)	*p*H value	6.5-8.5	No relaxation	b) Test at several dilutions
iv)	Taste	Agreeable	Agreeable	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	—
vi)	Total dissolved solids, mg/l,	500	2,000	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table No. 5: General Parameters Concerning Substances Undesirable in Excessive Amounts (*Foreword* and *Clause* 4)				
Sr. No.	**Characteristic**	**Requirement (Acceptable Limit)**	**Permissible Limit in the Absence of Alternate Source**	**Remarks**
1)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	—
2)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	—
3)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	—
4)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	—
5)	Boron (as B), mg/l, *Max*	0.5	1.0	—
6)	Calcium (as Ca), mg/l, *Max*	75	200	—
7)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	—

8)	Chloride (as Cl), mg/l, *Max*	250	1,000	—
9)	Copper (as Cu), mg/l, *Max*	0.05	1.5	—
10)	Fluoride (as F) mg/l, *Max*	1.0	1.5	—
11)	Free residual chlorine, mg/l, *Min*	0.2	1	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
12)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
13)	Magnesium (as Mg), mg/l, *Max*	30	100	—
14)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
15)	Mineral oil, mg/l, *Max*	0.5	No relaxation	—

16)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	—
17)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	—
18)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	—
19)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	—
20)	Sulphate (as SO_4) mg/l, *Max*	200	400	May be extended to 400 provided that Magnesium does not exceed 30
21)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	—
22)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	—
23)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	—
24)	Zinc (as Zn), mg/l, *Max*	5	15	—

NOTES:

1) In case of dispute, the method indicated by '*' shall be the referee method.

2) It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under ‘acceptable’ render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under ‘permissible limit in the absence of alternate source’ in col 4, above which the sources will have to be rejected.

Table 6: Parameters Concerning Toxic Substances

(*Foreword* and *Clause* 4)

Sr. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Remarks
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	—
vii)	Pesticides, µg/l, *Max*	—	No relaxation	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	or APHA 6630
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	—

Table 7: Bacteriological Quality of Drinking Water[1)] (*Clause* 4.1.1)		
Sr. No.	**Organisms**	**Requirements**
1)	All water intended for drinking: a) E. coli or thermo-tolerant coliform bacteria	Shall not be detectable in any 100 ml sample
2)	Treated water entering the distribution system: a) E. coli or thermo-tolerant coliform bacteria b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
3)	Treated water in the distribution system: a) E. coli or thermo-tolerant coliform bacteria b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

Table No. 8: Qualitative & Quantitative Parameters-Drinking Water Source at YCCE

Sr.No	Characteristics Parameters	Values
1)	Odour	Agreeable
2)	Colour	<1 Hazen
3)	Taste	Agreeable
4)	pH	7.2
5)	Electrical Conductivity	390
6)	Water Temperature	21
7)	Turbidity	0.3 NTU
8)	Total Solids (mg/L)	255
9)	Dissolve Solids (mg/L)	250
10)	Suspended solids (mg/L)	<5
11)	Relative Density	1
12)	Dissolve Oxygen (mg/L)	6
13)	Alkalinity (as CaCO3, mg/L)	190
14)	Total Hardness (as CaCO3, mg/L)	192
15)	Calcium (mg/L)	45.4
16)	Magnesium (mg/L)	15.4
17)	Chloride (mg/L)	8.6
18)	Sulphate (mg/L)	5.6
19)	Ortho Phosphate (mg/L)	<0.05
20)	Sodium (mg/L)	7.9
21)	Fluorides (mg/L)	0.3
22)	Iron (mg/L)	0.149
23)	Nitrates (mg/L)	1.320
24)	Aluminium (mg/L)	<0.025
25)	Copper(mg/L)	0.015
26)	Zinc(mg/L)	0.044
27)	Fecal coliform (CFU)	Absent
28)	E. Coli (CFU)	Absent

Table No. 9: Water Source : I] MIDC

Sr. No	Month/year	Total water qunatity (m^3)
1	January	480
2	February	393
3	March	440
4	April	565
5	May	442
6	June	781
7	July	822
8	August	531
9	September	353
10	October	402

Table No. 10: Water Source : II] MJP

Sr. No	Month	Year	Amount charged per 1000 litres	Total water qunatity (litres)	Total Units Used	Amount
1	April- July	2017	180	304000	304	54720
2	July- October	2017	180	327000	327	58860
3	October- December	2017	180	159000	159	28620
4	December 2017- January 2018	2018	180	138000	138	24840
5	February- March	2018	180	172000	172	30960
6	April- May	2018	250	260000	260	65000
7	June- July	2018	250	213000	213	53250
8	August- September	2018	250	127000	127	31750
9	October-November	2018	250	160000	160	40000

Table No .11: Rooftop Rainwater Harvesting Potential

Sr. No	Name of the Department	Terrace (Area)	Annual Rainfall (mm)	Runoff factor	RWH Potential (Litres)
1	Civil Building	650.42	1104.7	0.8	574815.18
2	Electrical Building	3620.14	1104.7	0.8	3199334.93
3	Mechanical Building	663.75	1104.7	0.8	586595.70
4	Mechanical Lab Shed	983.705	1104.7	0.8	869359.13
5	Workshop Shed	1128.81	1104.7	0.8	997597.13
6	Science Building	581.59	1104.7	0.8	513985.98
7	Civil Lab Shed	196.113	1104.7	0.8	173316.82
8	Electronics Building	3628.919	1104.7	0.8	3207093.46
9	Computer science	540.439	1104.7	0.8	477618.37
10	IT Building	568.955	1104.7	0.8	502819.67
11	Admin & Library	695.683	1104.7	0.8	614816.81

Annual Rainfall (mm)=1104.7 (July 2017 to June2018)

II] Air Audit

In addition to land and water, air is the prime resource for sustenance of life. In recent years, medium and small towns and cities have also witnessed an increase in pollution, thus getting fast reflected in the non-attainment cities of India. Air pollution has increasingly become a serious concern, predominantly because of its health impacts. Thus, regular track of Air Quality is important for human health.

One way to describe air quality is to report the concentrations of all pollutants with acceptable levels. An air quality index is defined as an overall scheme that transforms the weighed values of individual air pollution related parameters (for example, pollutant concentrations) into a single number or set of numbers.

Satellite Imagery No. 3: Sampling Locations of Air Component & Weather Component

Table No. 12: National Ambient Air Quality Standards

Sr. No.	Pollutants	Time weighted Average	Concentration of Ambient Air	
			Industrial, Residential, Rural Areas	Ecologically Sensitive Area
1.	Sulphur Dioxide (SO_2), µg/m^3	Annual	50	20
		24 hrs	80	80
2.	Nitrogen Dioxide (NO_2), µg/m^3	Annual	40	30
		24 hrs	80	80
3.	Particulate matter (PM_{10}), µg/m^3	Annual	60	60
		24 hrs	100	100
4.	Particulate matter ($PM_{2.5}$), µg/m^3	Annual	40	40
		24 hrs	60	60
5.	Ozone (O_3), µg/m^3	8 hours	100	100
		1 hours	180	180
6.	Carbon monoxide (CO) mg/m^3	8 hours	02	02
		1 hours	04	04

Source: National Ambient Air Quality StandarDs, CPCB, New Delhi, 18th November, 2009

Table No .13: Qualitative and Quantitative Characteristics of Air pollutants in YCCE

Sr. No.	Location	CO	NO_2	SO_2	PM 2.5	PM 10	O_3	NH_3
1)	L1	1878	8.24	19.78	221.56	240	87.21	25
2)	L2	1879	8.45	19.78	221.56	244	87.21	25
3)	L3	560.4	2.67	40.21	78.73	80.1	118.6	25
4)	L4	566.7	2.67	40.22	78.73	80.2	118.6	25
5)	L5	5	3.45	42	160	85	38	25
6)	L6	5	3.45	42	160	85	38	25
7)	L7	550	2.76	41.32	70.97	79.34	117.3	25

Table No. 14: Assessment of Air Quality Index (AQI) at YCCE

Sr. No.	Location	AQI	PM 2.5
1)	L1	271	221.56
2)	L2	271	221.56
3)	L3	163	78.73
4)	L4	163	78.73
5)	L5	210	160
6)	L6	210	160
7)	L7	159	70.97

III] Weather and Climate

Weather is the mix of events that happen each day in our atmosphere. Even though there's only one atmosphere on Earth, the weather isn't the same all around the world. Weather is different in different parts of the world and changes over minutes, hours, days, and weeks. Most weather happens in the part of Earth's atmosphere that is closest to the ground—called the troposphere. Whereas weather refers to short-term changes in the atmosphere, climate describes what the weather is like over a long period of time in a specific area. Different regions can have different climates.

Weather is made up of multiple parameters, including air temperature, atmospheric (barometric) pressure, humidity, precipitation, solar radiation and wind. Each of these factors can be measured to define typical weather patterns and to determine the quality of local atmospheric conditions. The environmental conditions produced by different weather parameters have an impact on the quality of the surrounding ecosystem. Weather monitoring can establish a database of typical conditions. When one or more weather elements deviate from this standard, the information can be used to explain or predict weather events.

Table No .15: Qualitative and Quantitative Characteristics of Weather and Climate at YCCE

Sr. No.	Location	Air Temp (ºC) Min.-Max.	Relative Humidity (%)	UV Index	Pressure (KPa)	Wind Speed (Km/hr)	Wind Chill (%)	Dew Point (ºC)	Cloud Cover (%)
1)	L1	22-28	70	4.1	1020	1.11	26	15	0
2)	L2	23-28	70	6.5	1019	1.11	26	15	30
3)	L3	17-29	38	6.1	1018	1.11	26	15	38
4)	L4	17-27	51	7	1018	1.11	26	15	31
5)	L5	17-26	45	7	1017	1.11	26	15	0
6)	L6	17-33	45	7	1017	0.55	27	12	37
7)	L7	17-31	38	6.1	1018	1.11	27	12	34
8)	Mean	18.57-28.8	51.00	6.26	1018.14	1.03	26.29	14.14	24.29
9)	SD	2.70-2.41	13.74	1.03	1.07	0.21	0.49	1.46	16.84

IV] Soil Audit

Soil is important as a medium for plant growth and for the support of much animal and human activity. The Soil acts as the reservoir for the nutrients and water providing the plant's needs for these requirements throughout their growth. Indeed soil (and the soil constituents), together with the plant life it supports, the rock on which it lies, and the climate it experiences, forms a finely balanced system.

The soil performs many functions. These include functions related to natural ecosystems, agricultural productivity, and environmental quality, soil as source of raw materials and as base for buildings. Of these the agricultural productivity function is probably the most widely recognized and understood.

The soil samples were collected from different locations within the YCCE campus by random sampling method and then further these samples were equilibriated by quartering and coning method. Further the big stones and mudballs were removed and the soil was sieved through the fine sieve and then was subjected for further qualitative and quantitative physico-chemical analysis.

Satellite Imagery No. 4: Sampling Locations of Soil Component

Table No. 16: Standard Soil Classification

Sr. No.	Soil Tests	Range	Classification
1)	pH	<4.5	Extremely acidic
		4.51-5.50	Very strongly acidic
		5.51-6.00	Moderately acidic
		6.01-6.50	Slightly acidic
		6.51-7.30	Neutral
		7.31-7.80	Slightly alkaline
		7.81-8.50	Moderately alkaline
		8.51-9.00	Strongly alkaline
		9.01	Very strongly alkaline
2)	Salinity (mmhos/cm), (1ppm=640 mmhos/cm)	Upto 1.00	Average
		1.01-2.00	Harmful to germination
		2.01-3.00	Harmful to crops
3)	Organic carbon (%)	Upto 0.2	Very Less (for crops)
		0.21-0.4	Less
		0.41-0.6	Medium
		0.61-0.8	On an average sufficient
		0.81-1.0	Sufficient
		>1.0	More than sufficient

4)	Nitrogen (Kg/ha)	Upto 50	Very Less (for crops)
		51-100	Less
		101-105	Good
		151-300	Better
		>300	Sufficient
5)	Phosphorus (Kg/ha)	Upto 15	Very Less (for crops)
		16-30	Less
		31-50	Medium
		51-65	On an average sufficient
		66-85	Sufficient
		>80	More than sufficient
6)	Potash (Kg/ha)	0-120	Very Less (for crops)
		121-180	Less
		181-240	Medium
		241-300	Average
		301-360	Better
		>360	More than sufficient

Source: Hand Book of Agriculture, ICAR, New Delhi

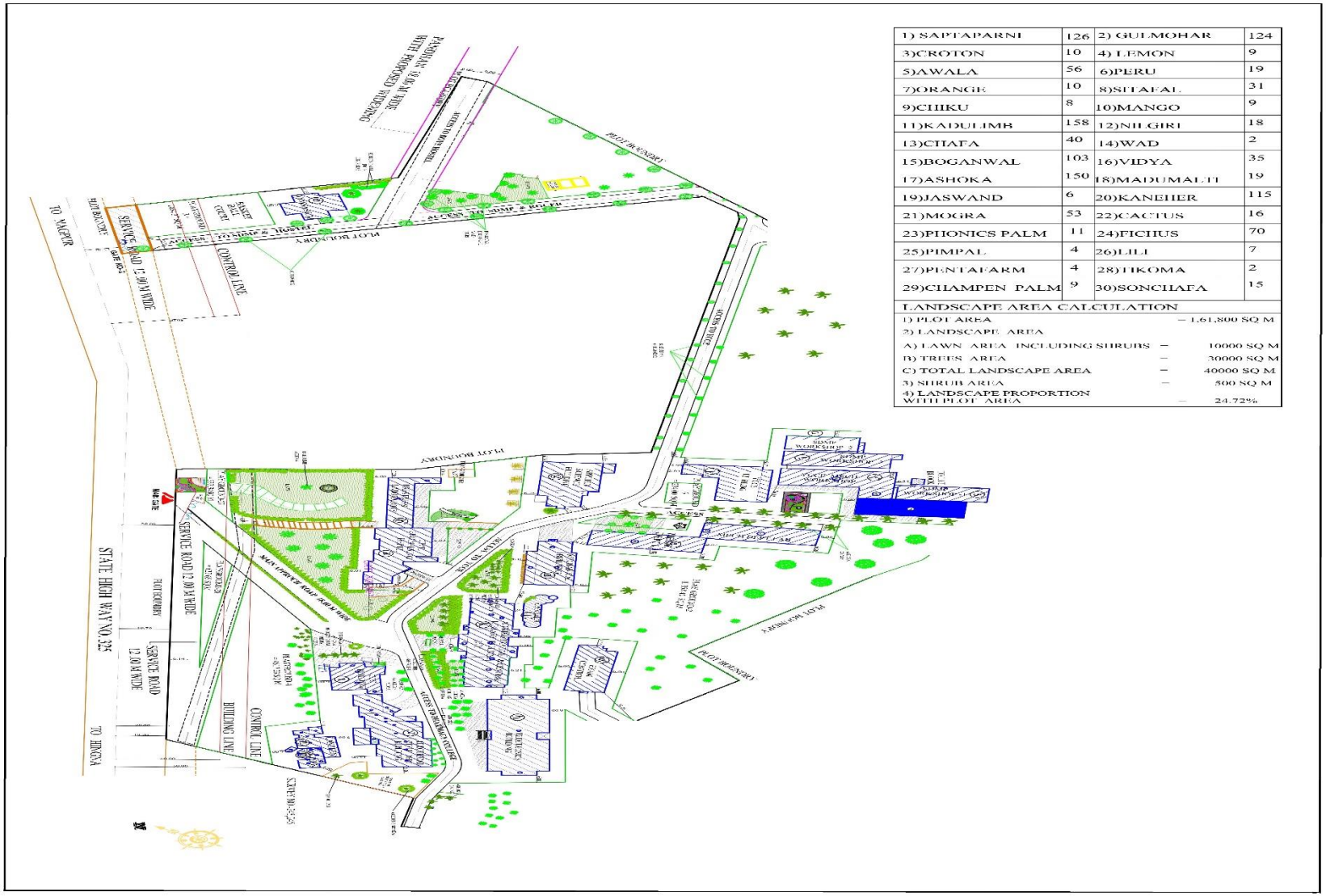
Table No. 17: Qualitative and Quantitative Characteristics of Soil at YCCE

Sr. No.	Parameters	Units	Results
1	Available Nitrogen	mg/kg	201
2	Available Phosphorous	mg/kg	9.12
3	Available Potassium	meq/100g	0.687
4	Organic Carbon	%	0.813
5	Bulk Density	g/cm^3	0.31

V] Vegetation Audit

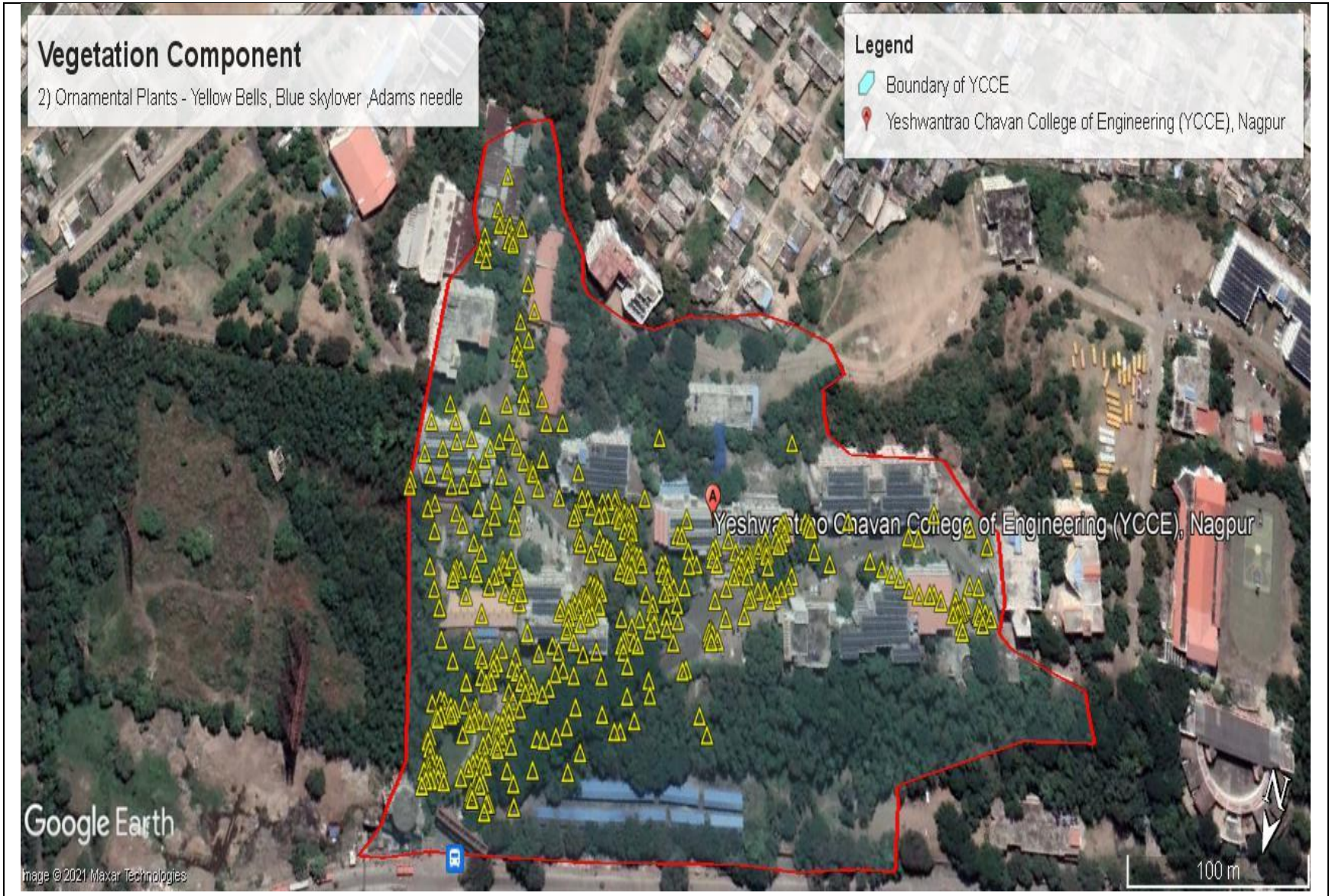
Trees play a critical role for people and the planet. Numerous studies have demonstrated that the presence of trees and urban nature can improve people's mental and physical health, children's attention and test scores, the property values in a neighborhood, and beyond. Trees cool our urban centers. Trees are essential for healthy communities and people. The benefits that trees provide can help cities and countries meet 15 of the 17 internationally supported United Nations Sustainable Development Goals. Trees can promote a quality education, which has innumerable advantages for society.

The Flora component was studied by observation and identification method. The vegetation was further categorized as: Shrubs, Ornamental Species, Medicinal Species and Tree Species.



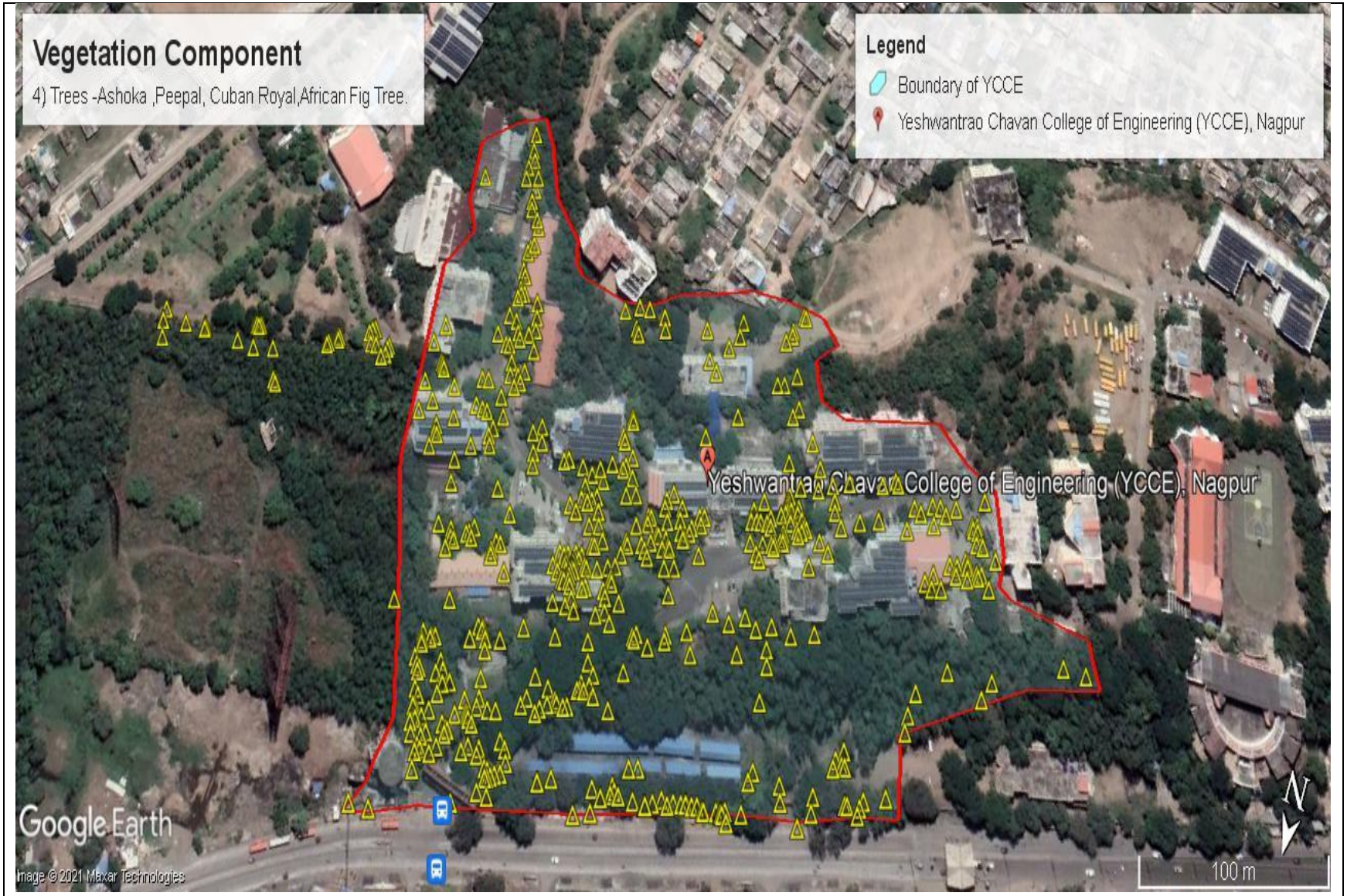
Map No. 2: Vegetation Map of YCCE Campus

Map No. 5: Vegetation Map of YCCE Campus

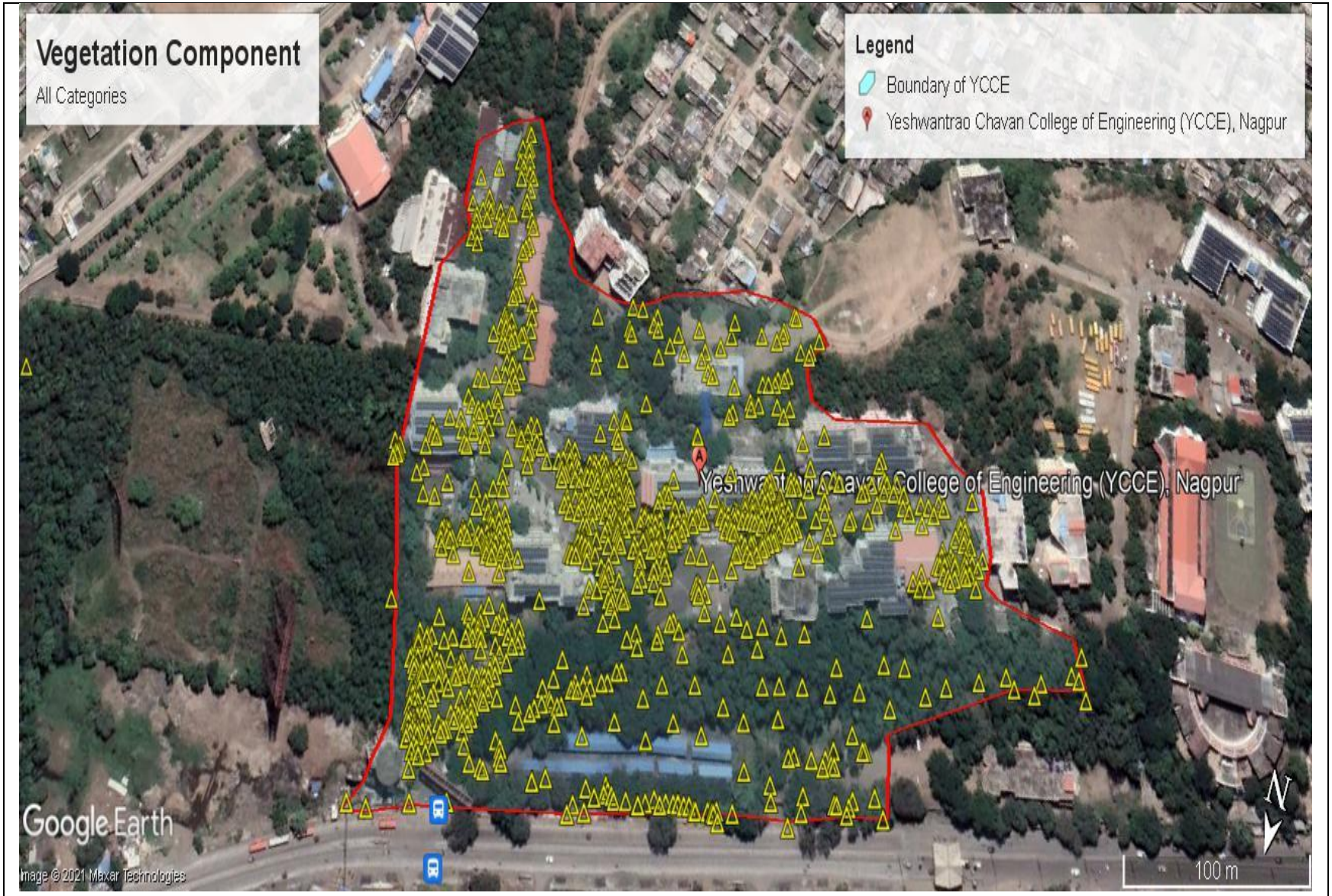


Map No. 6: Vegetation Map of YCCE Campus

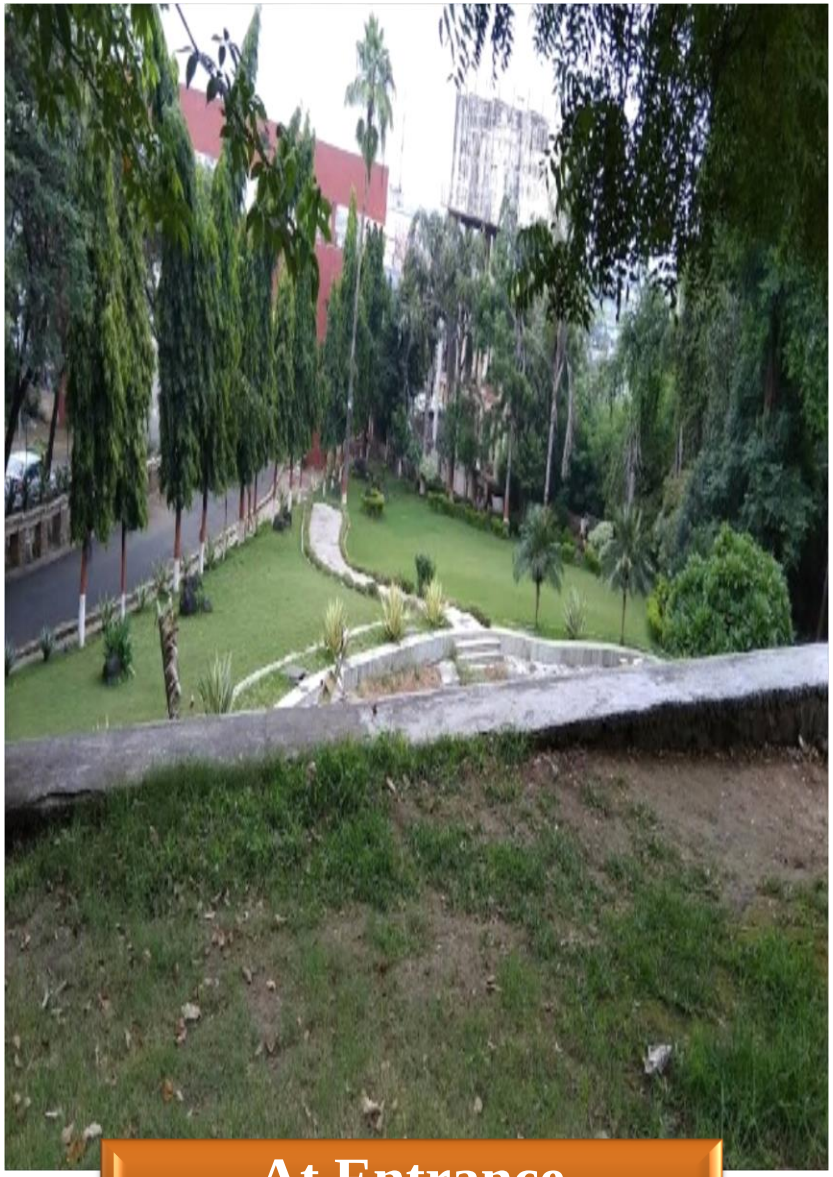
Map No. 7: Vegetation Map of YCCE Campus



Map No. 8: Vegetation Map of YCCE Campus



Map No. 9: Vegetation Map of YCCE Campus



At Entrance

Within Campus

Table No .18: Vegetation at YCCE: I] Medicinal Species

Sr. No.	Scientific Name	Common Name	Total Species
1)	*Celastrus orbiculatus Thunb*	Oriental bittersweet	7
2)	*Azadirachta indica*	Neem	58
3)	*Phyllanthus amarus*	Carry me seed	1
4)	**Total**		66

Table No .19: Vegetation at YCCE: II] Ornamental Species

Sr. No.	Scientific Name	Common Name	Total Species
1)	*Amelanchier laevis*	Juneberry	20
2)	*Bougainvillea spectabilis*	Great bougainvillea	11
3)	*Thevetia neriifolia*	Yellow oleander	5
4)	*Bougainvillea spectabilis*	Great Bougainvillea	1
5)	*Duranta erecta*	Golden dewdrop	12
6)	*Ixora coccinea*	Ixora	2
7)	*Murraya paniculata*	Orange jasmin	1
8)	*Agave desmettiana Jacobi*	Dwarf century plant	11
9)	*Agave sisalana Perrine*	Mescal	3
10)	*Bougainvillea spectabilis Wild*	Great bougainvillea	32
11)	*Duranta erecta L.*	Golden dewdrops	25
12)	*Euphorbia characias L.*	Mediterranean spurge	13
13)	*Hibiscus rosa-sinensis L.*	Hawaiian hibiscus	5
14)	*Phymosia umbellata*	Mexican Bush Mallow	3
15)	*Tecoma stans (L.) juss. Ex Kunth*	Yellow-bells	2
16)	*Acalypha wilkesiana*	Copperleaf	11
17)	*Agave sisalana perrine*	Mescal	5
18)	*Agave vivipara*	Garden sisal	6
19)	*Alternanthera brasiliana*	Ruby leaf	2
20)	*Bougainvillea glabra*	Bougainvillea	11

21)	*Bougainvillea spectabilis*	Great baugainvillea	26
22)	*Breniya disticha*	Foliage flower	1
23)	*Callistemon citrinus*	Crimson bottlebrush	3
24)	*Canna indica*	Canna lily	5
25)	*Carex morrowii Booty*	Japanese sedge	1
26)	*Cascabela thevetia*	Yellow oleander	25
27)	*Catharanthus roseus*	Periwinkle	16
28)	*Cestrum nocturnum*	Night jasmine	1
29)	*Chlorophytum comosum*	Spider plant	3
30)	*Codiaeum variegatum*	Croton	4
31)	*Cordyline fruticosa*	Broadleaf palm lily	1
32)	*Cycas revoluta*	Sago palm	2
33)	*Duranta erecta*	Golden dewdrop	147
34)	*Furcraea foetida*	Mauritius hemp	17
35)	*Heliconia rostrata*	Lobster claw	3
36)	*Hibiscus rosa sinensis*	Hawaiian hibiscus	19
37)	*Ixora coccinea*	Ixora	14
38)	*Jacaranda mimosifolia*	Blue jacaranda	1
39)	*Lagerstroemia indica*	Crapemyrtle	1
40)	*Lantana .montevidensis*	Purple lantana	2
41)	*Lantana camara*	Lantana	2
42)	*Murraya paniculata*	Orange jasmine	9
43)	*Neomarica gracilis*	Brazilian walking iris	9
44)	*Peltophorum pterocarpum*	Copper Rod	1
45)	*Pereskia grandifolia*	Rose Cactus	2
46)	*Rosa chinensis*	Bengal rose	2
47)	*Rosa gallica*	Hungarian rose	3
48)	*Rosmarinus officinalis*	Rosemary	1
49)	*Sphagneticola trilobata*	Wedelia	6
50)	*Tecoma stans*	Yellow bells	18

51)	*Thunbergia grandiflora*	Blue skyflower	1
52)	*Yucca filamentosa*	Adams needle	1
53)	*Yucca gloriosa*	Spanish dagger	1
54)	**Total**		617

Table No .20: Vegetation at YCCE: III] Shrubs Species

Sr. No.	Scientific Name	Common Name	Total Species
1	*Coffea arabic L.*	Arabian coffee	11
2	*Comoclinium coelestinum*	Blue mist flower	29
3	*Jasminium sambac*	Arabian jasmin	49
4	*Leucaena leucocephala*	Coffeebush	6
5	*Pseuderanthemum carruthersii*	Purple false erranthemum	5
6	*Acalypha indica*	Indian Copperleaf	6
7	*Buglossoides purpuro caerulea*	Purple gromwell	8
8	*Cardiospermum halicacabum*	Ballon vine	11
9	*Carissa carandas*	Karandang	4
10	*Cordia myxa*	Sebesten plum	2
11	*Cyanthillium cinereum*	Little ironweed	5
12	*Desmodium paniculatum*	Panicled tick clover	9
13	*Galphimia glauca*	Gold shower	13
14	*Hamelia patens*	Redhead	8
15	*Iris foetidissima*	Stinking Iris	5
16	*Lactuca virosa*	Bitter lettuce	6
17	*Leucaena leucocephala*	Coffee bush	14
18	*Ligustrum vulgare*	Common privet	25
19	*Mirabilis jalapa*	Four o' clock flower	2
20	*Myoporum tenuifolium*	Manatoka	4
21	*Nerium oleander*	Oleander	1
22	*Nerium oleander*	Oleander	8

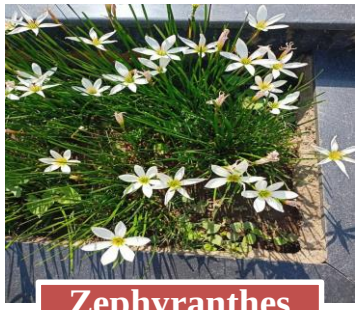
23	*Plumbago auriculata*	Plumbago	5
24	*Podranea ricasoliana*	Queen of sheba vine	3
25	*Pseuderanthemum carruthersii*	Purple False Eranthemum	2
26	*Ruscus aculeatus*	Box holly	5
27	*Senna occidentalis*	Antbush	3
28	*Syringa vulgaris*	Lilac	4
29	*Tabernaemontana divaricata*	Crape jasmine	9
30	*Tridax procumbens*	Coatbuttons	12
	Total		274

Table No .21: Vegetation at YCCE: IV] Tree Species

Sr. No.	Scientific Name	Common Name	Total Species
1)	*Saraca asoca*	Ashoka	112
2)	*Ficus religiosa*	Peepul	1
3)	*Roystonea regia*	Cuban royal palm	5
4)	*Casuarina cunninghamiana*	Beefwood	9
5)	*Ficus cyanthistipula*	African fig tree	2
6)	*Syngonium podophyllum*	Arrowhead vine	6
7)	*Hymenocallis littoralis*	Beach spider lily	1
8)	*Ligustrum lucidum*	Chinese privet	2
9)	*Psidium guajava*	Common guava	3
10)	*Roystonea regia*	Cuban royal palm	5
11)	*Murraya koenigii*	Curry leaf	8
12)	*Alstonia scholaris*	Dita bark	41
13)	*Hyphene coriaceae*	Doum palm	4
14)	*Plumeria rubra*	Frangipani	4
15)	*Plumeria pudica*	Golden arrow	4
16)	*Lonicera japonica*	Honeysuckle	4
17)	*Washingtonia robusta*	Mexican washington palm	4

18)	*Bauhinia variegata*	Orchid tree	4
19)	*Ficus religiosa*	Sacred fig	4
20)	*Cycus revoluta*	Sago palm	4
21)	*Phoenix reclinata*	Senegal date palm	4
22)	*Annona squamosa*	Sugar apple	4
23)	*Citrus sinensis*	Sweet orange	4
24)	*Terminalia catappa*	Tropical almond	4
25)	*Schotia brachypetale*	Weeping boer bean	4
26)	*Platycladus orientalis*	Chinese arborvitae	4
27)	*Juniperus chinensis*	Chinese juniper	4
28)	*Thuja occidentalis*	Northern white cedar	4
29)	*Cupressus sempervirens*	Mediterranean cypress	4
30)	*Carica papaya*	Papaya	4
31)	*Alstonia scholaris*	Ditabark	4
32)	*Roystonea regia*	Cuban royal palm	4
33)	*Senna siamea*	Siamese cassia	6
34)	*Caesalpinia echinata*	Brazil wood	15
35)	*Albizia lebbeck*	Frywood	2
36)	*Alstonia scholaris*	Devil tree	3
37)	*Plumeria obtusa*	Singapore graveyard	10
38)	*Ficus benjamina*	weeping fig	3
39)	*Citrus aurantifolia*	Sweet orange	4
40)	*Campsis radican*	Trumpet vine	7
41)	*Terminalia catappa*	Indian almond	5
42)	*Bambusa vulgaris*	Common bamboo	59
43)	*Alstonia scholaris*	Devil tree	6
44)	*Caesalpinia pulcherrima*	Peacock flower	19
45)	*Caryota urens*	Jaggery palm	11
46)	*Platycladus orientalis*	Chinese arborvitae	9
47)	*Platycladus orientalis*	Chinese arborvitae	26

48)	*Ficus cyanthistipula*	African fig tree	29
49)	*Bismarckia nobilis*	Silver Bismarck Palm	6
50)	*Duranta erecta*	golden dewdrop	19
51)	*Bombax ceiba*	Cotton tree	5
52)	*Ficus sycomorus*	Sycamore fig	9
53)	*Pongamia pinnata*	Indian beech	2
54)	*Ficus religiosa*	Sacred fig	9
55)	*Alstonia scholaris*	Ditabark	8
56)	*Magnolia grandiflora L.*	Southern magnolia	19
57)	*Juniperus thurifera L.*	Incense Juniper	7
58)	*Citrus sinensis (L.)*	Valencia orange	3
59)	*Ravenala madagascariensis*	Traveler's palm	13
60)	*Ficus benjamina*	Weeping fig	10
61)	*Terminalia catappa*	Tropical almond	5
62)	*Gleditsia triacanthos*	Honey locust	3
63)	*Senna siamea*	Ironwood Cassia	4
64)	*Rauvolfia caffra Sond.*	Quininetree	15
65)	*Psidium guajava L.*	Common guava	6
66)	*Roystonea regia (Kunth) 0.F.Cook*	Cuban royal palm	18
67)	*Tipuana tipu (benth.) Kuntze*	Tiputree	35
68)	*Theobroma cacao L.*	cocoa	39
69)	*Caesalpinia pulcherrima (L.)Sw.*	Pride-of-Barbados	14
70)	*Prosopis pallida (wild.) Kunth*	Kiawe	6
71)	*Ficus hispida L.f.*	Hairy fig	2
72)	*Dalbergia latifolia Roxb.*	East Indian rosewood	1
73)	**Total**		718



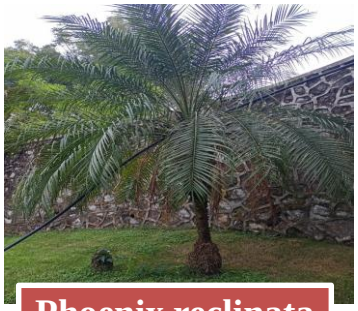
Zephyranthes candida

Musa paradisiaca

Tecoma stans

Ficus benjamina

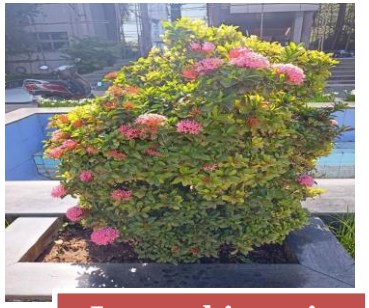
Brahea armata



Phoenix reclinata

Bauhinia variegata

Duranta erecta

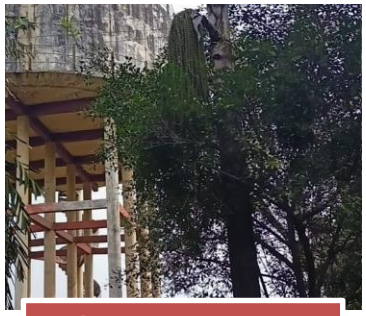


Ixora chinensis

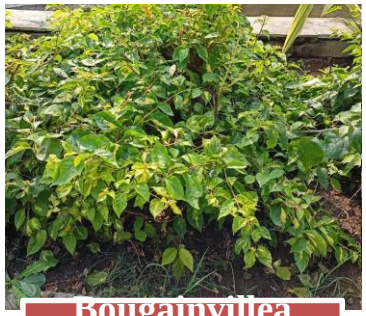
Thuja occidentalis

Murraya paniculata

Plumeria rubra



Caryota urens



Bougainvillea glabra

Galphimia glauca

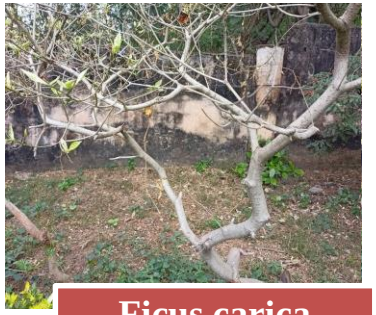
Agave vivipara

Jasminum sambac

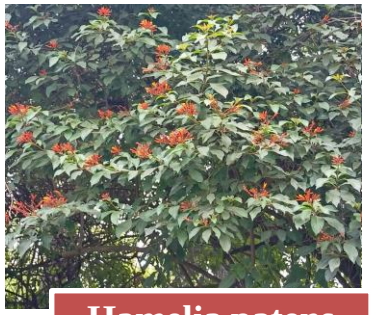
Dracaena fragrans

Bougainvillea buttiana

Washingtonia robusta

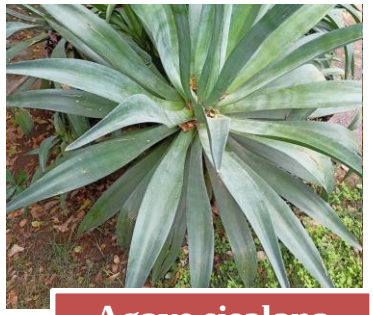


Ficus carica

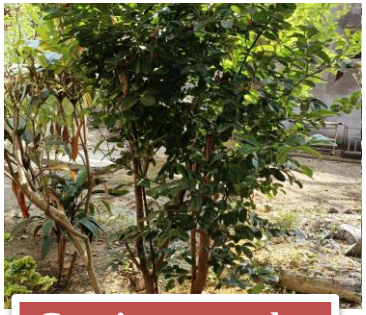


Hamelia patens

Plumbago auriculata



Agave sisalana



Carrisa carandas

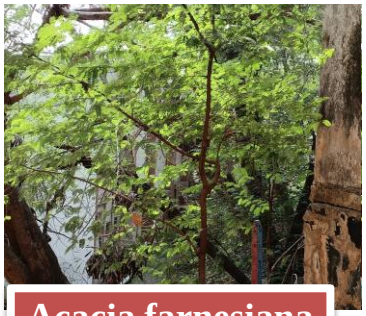
Jatropha podagrica

Alistonia scholaris

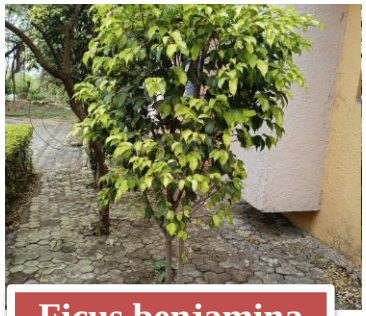
Magnifera indica

Leucaena leucocephala

Senna siamea



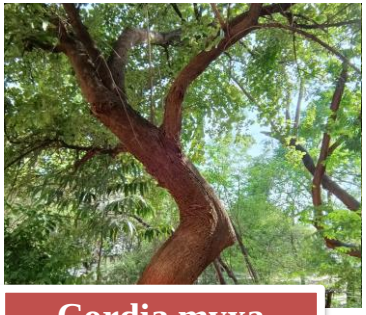
Acacia farnesiana



Ficus benjamina

Ficus microcarpa

Thespesia populnea



Cordia myxa

Ixora coccinea

VI] Fauna Audit

Diversity of avifauna is one of the most important ecological indicators to evaluate the quality of habitats. Random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of woods and lands are the main factors responsible in narrowing down the avian foraging habitat and nesting sites. Urban bird densities are normally extremely high (Walsh, 2006). Increase in bird densities may be the result of high food density, low predation pressure or combination of both (Shochat, 2004). Birds are essential animal group of an ecosystem that maintains a trophic level.

The fauna species were documented by observation and identification method durig the field excursion. The observed species are photographed as an evidence of presence in the YCCE campus. This data shall help understand the type of Ecological food chain existing in the environmental segment of YCCE.

Satellite Imagery No. 9: Sampling Area for Fauna Audit

Merops orientalis

Apis mellifera comb

Columba livia domestica

Omocestus viridulus

Euploea core

Spilopelia senengalensis

Catopsilia florella

Psittacula krameri

VII] Energy Audit: A) Electric Audit

Electricity is a basic part of nature and it is one of our most widely used forms of energy. Many cities and towns were built alongside waterfalls (a primary source of mechanical energy) that turned water wheels to perform work. An electric utility power station uses a turbine, engine, water wheel, or other similar machine to drive an electric generator or a device that converts mechanical or chemical energy to generate electricity. Electricity is measured in units of power called watts. It was named to honor James Watt, the inventor of the steam engine. The amount of electricity a power plant generates or a customer uses over a period of time is measured in kilowatt-hours (kWh).

The electric energy component was analyzed with due details about no. of units utilized daily/monthly and also departmentwise all the electrical equipments utilizing electrical energy were enlisted with the amount of energy they utilize.

Table No .22: List of Electrical Equipments at Departmen of Civil

Sr No	Name of Lab	Fan 60 w	Tube light		LED 18 W	CFL 18x2 w	Tube Light 36 w	PC	Printer	Projector	Monitor	EPBX m/c	TV	Exhaust Fan	Wall Fan	AC Split	AC Window	Freez	Universal Testing m/c	M/C 5 HP	Oven	motor 0.75 hp	motor 2 hp	motor 180 w	motor 2.5 hp	coil 1000w	Motor 0.5 hp	motor 3.7 kw	Heater5 000 w
			T5	20 w																									
	Ground Floor																												
1	1 staff Room	2		2				2	1																				
2	2 Lab	4		3			4	1							1				1	1									
3	3 & 4 Office	2	1	2	1	5	1		1	2		1		1		2													
4	5 Office	2	1	5				1	1							2													
5	Passage			4									1																
6	Gents Toilet pannel Room			2										1															
7	Transportation Engg 006	4		2			5	1							1							1	1	1	1	2			
8	Structures Lab 007	4		3			2	1																					
9	Geology Engg Lab 008	3	4	1			1	2	1																				
10	CE 009	4		4			3															2					1		
11	12 Lab	4		7				4																					
12	13 Lab	4		7				4																					
13	14 Lab	3	2	1				3	1																				
14	15 Girls Common Room	3		4										1															
15	Strength of Material	4	1	2			2	2																					
16	Geotechnical Lab	6		4			5	1							1												1		
17	Concret Lab	10	7	1			10																4		2			1	1
18	Sarve Lab	3	2	2			5	1																					
19	**First Floor**																												
20	Staff Room	2	1	2				2																					
21	Computer Lab 102	8			15			40									3												
22	Computer Lab 103	8			15			25	2	1	3						4												
23	Computer Lab 104	4		2			6														3								
24	Computer Lab 105	4				24		30									3												
25	Water supply Lab 106 A	4		2			4	1													4	1							
26	Servey Lab	4					6	1																					
	CE 110	1		2																									
	Structual Dynamics 109	7	7	1				2							1							1							
27	CE 108	1		2				1	1																				
28	Passage			3			1																						
29	Toilet			1										1															
30	CE 111	7	5	1				2										1			1								
31	**Second Floor**																												
32	Room no 203 A	3		3																									
	Room no 203 B	3		3			1																						
	Room No 204A	3		5																									
33	Room no 204 B	4		3			1																						
34	Room no 205 A	3		4			1																						
	Room no 205 B	2		4																									
35	Room no 208	8	3	5																									
36	Room no 209	9	6	4																									
37	Toilet			1										1															
38	Passage			2			2																						
39	**Third Floor**																												
40	Room no 302	7	5	4																									
41	Room no 303	7	4	5																									
42	Room no 304	7	6	2																									
43	Room no 305	9	4	5																									
44	Room no 306	7	2	6																									
45	Room no 308	7	2	5																									
46	Room no 310	9	4	7																									
47	Toilet			3										2															
48	Passage		3	4																									
49	**Total**	200	70	147	31	29	60	127	8	3	3	1	1	7	4	4	10	1	1	1	8	5	5	1	3	2	2	1	1
50	**Watts**	60	28	20	18	36	36	150	100	100	100	200	100	300	60	2000	2000	500	500	3730	2000	560	1492	180	1865	1000	373	3700	5000
51	**Total Watts**	12000	1960	2940	558	1044	2160	19050	800	300	300	200	100	2100	240	8000	20000	500	500	3730	16000	2800	7460	180	5595	2000	746	3700	5000
52	**Per day Hrs**	7	7	7	7	7	7	7	1	1	24	24	2	12	7	7	7	7	2	2	2	2	2	1	1	1	2	2	1
53	**Per Month KWH**	2016	329.3	493.92	93.7	175.39	362.88	3200.4	19.2	7.2	172.8	115.2	4.8	604.8	40.3	1344	3360	84	24	179	768	134.4	358.1	4.32	134.28	48	35.808	177.6	0

Table No .23: List of Electrical Equipments at Department of Electronics

Sr no.	Name of Lab	Fan 60 w	Tube light			LED 6 W	LED 18 w	CFL 36x2 W	CFL 18x2 w	Tube Light 36 w	PC	Printer	Projector	Monitor	Dotmatrix Pri.	Ducting Cooler	Exhaust Fan	Wall Fan	AC Split	Ducting AC	Speeker	CRO	Water cooler	Zerox M/C	Calibration M/c	Napli n m/c
			T5	20w	36x2																					
	First Floor																									
1	HOD Office	2				1	2	2	4		1	1					1		1					1		
2	HOD Office	4						2	4		1	1		1												
3	Dept.Library	6							7		1		1					6	2							
4	Faculty Room	11						6	17		14			1		1										
5	Toilet		2														1									
6	Faculty Room		2								1	1						2								
7	Conference Hall	12						8	18		1		1							1	6					
8	PG Lab 102	6						4	14		25									1						
9	Faculty Room 101	2							6		3							3	1							
10	Faculty Room 110	3					2		5		2	1							1							
11	PG Lab 111	7						6	14		23		1													
12	Electronics measurument116	6						6	14		8											10				
13	AIC Lab 115	7		1				6	14		8											26				
14	Passage						3		13														1			
15	Ground Floor																									
16	Reserch Lab	3							6		10														1	
17	Microprocessor Lab	12					1	10	7		37							2		1		2				
18	DSD Lab 005 B	12						10	8		47	1	1			1		2								
19	Gents Toilet			1													1									
20	Passage Right						3		19																	
21	Passage Left						2		14														1			
22	Workshop Lab	6	2	4							12			1							2	4				
23	Electronics Device 007B	11	6	5					4		11											8				
24	Second Floor																									
25	Class Room 206	7	3	5						1	1		1													
26	Class Room 207	7		8				2			1		1													
27	Class Room 208	11						10	12		1		1													
28	Class Room 209	7		5				2		1	1		1													
29	Class Room 210	7	1	7						1	1		1													
30	Class Room 211	8	3	4						1	1		1													
31	Class Room 212	3	1	1						1	1		1													
32	Passage Left		1				3		13								1						1			
33	Girls Common Room								4									2								1
34	Students Activity Room								2									1								
35	Passage Right						4		23								1						1			
36	Third Floor																									
37	ET 325	6						2	12		25															
38	Distance Education center 302	3						6	10		1		1						1							
39	Class Room 315	3		2							1		1													
40	Class Room 315 B	3		2							1		1													
41	Passage left						3		4																	
42	Toilet			1													1						1			
43	Deshmukh sir Store Cabin	1		1	1			1			2	1			1											
44	Issue Counter	2		3							1	1			1											
45	Store Room		1	9																				1		
46	Passage	1		3																						
47	Vastage Room	1		1																						
48	Out Side	0		2																						
49	**Total**	180	22	65	1	1	23	83	261	5	243	7	14	3	2	2	6	18	6	3	8	50	5	2	1	1
50	**Watts**	60	28	20	72	6	18	72	36	36	150	100	100	100		###	300	60	2000	2000	100	50	1500	500	100	200
51	**Total Watts**	####	616	1300	72	6	414	5976	9396	180	36450	700	1400	300		###	1800	1080	12000	6000	800	2500	7500	1000	100	200
52	**Per day Hrs**	7	7	7	7	2	7	7	7	7	7	1	2	24		2	12	7	7	2	2	1	7	1	1	1
53	**Per MonthKWH**	1890	108	228	13	0.3	72	1046	1644	31.5	6379	17.5	70	180		200	540	189	2100	300	40	62.5	1313	25	2.5	5

Table No .24: List of Electrical Equipments at Department of Electronics and Telecommunication

Sr no.	Name of Lab	Fan 60 w	Tube light		LED 6 W	LED 18 w	CFL 36x2 W	CFL 18x2 w	Tube Light 36 w	PC	Printer	Projector	Monitor	Ducting Cooler	TV	Exhaust Fan	Wall Fan	AC Split	Speeker	CRO	Zerox M/C	Hand Drill m/c
			T5	20																		
	Ground Floor																					
1	Electronics Device 01	6	2	7						10										6		
2	Cumunication Lab	11		4			6	4	5						8					10		
3	Micro vave Lab	9	5	8			1			1										10		
4	Programing 001A	12					10	6		41		1					1	1				
5	Digital Signal 002A	12					10	6		42		1	1				1	1				
6	Faculty Room	1		1						1							1					
7	Passage							10							1							
	First Floor																					
8	Dept. Library119	3						10		1		1						2				
9	HOD Office 118	3						10		3	2		2					1			1	
10	Faculty Room 117	3		1		1		8		4	2							2				
11	Faculty Room 112	11		1		1	6	20		15	3			2		1	5					
	Second Floor																					
12	ETC Dept.218	3		3					3	7	1						1					
13	Class Room 217	7	1	5					1	1		1										
14	Class Room 216	7		7					3	1		1										
15	Class Room 215	7	1	3					5	1		1										
16	Class Room 201	10					9	12		1		1							2			
17	Class Room 202	7				1	5	9		1		1										
18	Class Room 203	7		6					1	1		1										
	Third Floor																					
19	Class Room318	3	1	1																		
20	PG Lab321	7	1	7					1	21	1											
21	Anolog Circuit 317	6	2	3						5										10		
22	Project Lab 322	6	2	2						6										3		2
23	Class Room 316	6	10																			
24	Class Room 323	8	1	6																		
25	Class Room 324	3	2	2																		
26	Faculty Room 313	4					4	6		3							1					
27	Faculty Room 311	4					4	6		3	1											
28	Lab 309	4					4	12		5							1	1				
29	Conference Hall 304	16					8	17		1	1			2					4			
30	Class Room 308	6					6	2														
31	Micro Controler 307	6					6			23	1							1				
32	Toilet			1												1						
33	Passage					3		23								1						
34	Total	198	28	68	0	6	79	161	19	198	12	9	3	4	9	3	11	9	6	39	1	2
35	Watts	60	28	20	6	18	72	36	36	150	100	100	100	2000	200	300	60	2000	100	50	500	100
36	Total Watts	11880	784	1360	0	108	5688	5796	684	29700	1200	900	300	8000	1800	900	660	18000	600	1950	500	200
37	Per day Hrs	7	7	7	2	7	7	7	7	7	2	2	24	2	2	12	7	7	2	2	2	1
38	Per MonthKWH	1995.8	132	228	0	18	955.6	974	115	4990	57.6	43.2	173	384	86.4	259.2	111	3024	29	93.6	24	4.8

Table No .25: List of Electrical Equipments at Department of Information Technology

Sr no.	Name of Lab	Fan 60 w	Tube light		CFL 1x18 w	LED 18 w	PC	Printer	Projector	Monitor	Ducting Cooler	TV	Exhaust Fan	Wall Fan	AC Split	Zerox M/C
			T5	20												
	Second Floor															
1	Software Engg Lab	10			14		20									
2	Advance NetWorking	6			13		20									
3	Project Lab	10			14		21	1		1						
4	Staff Room	1			3	1	1									
5	Staff Room 2				8		2	1						3		
6	Ladies Toilet		2	2									1			
7	Passage				18						5	1				
8	HOD Office				11		2	2		1					1	1
9	Dept. Library	3			8		2		1						2	
10	ACL Lab	8			15		22	1						1	1	
11	Tutorial Room	3			8				1							
12	IT Staff Room 1	10			14		23									
	Third Floor															
13	Open Source Lab	10			14		21		1							
14	Com. Program Lab2	7			13		20									
15	Com. Program Lab1	10			14		22			1						
16	Staff Room 3	2		2			5	1						3		
17	Gentes Staff Room															
18	Class Room 309		3	1												
19	Class Room 302	9	4	2					1							
20	Class Room 301	9	4	3					1							
21	Tutorial Room	9	3	5					1							
22	Passage	2	2	1					1							
23	311			8		6					3					
	First Floor															
24	Class Room 102	6	1	3												
25	Class Room 107	6	2	3												
26	Class Room 105	6	2	3												
27	Toilet			2												
28	Passage		5	2												
29	Student Activity															
30	Engg Graphics															
31	**Total**	127	28	37	167	7	181	6	7	3	8	1	1	7	4	1
32	**Watts**	60	28	20	18	18	150	100	100	100	2000	200	300	60	2000	500
33	**Total Watts**	7620	784	740	3006	126	27150	600	700	300	16000	200	300	420	8000	500
34	**Per day Hrs**	7	7	7	7	7	7	1	2	24	2	2	12	7	7	2
35	**Per MonthKWH**	1280	132	124	505	21	4561	14	33.6	173	768	9.6	86.4	70.6	1344	24

Table No .26: List of Electrical Equipments at Department of Old Science

Sr no.	Name of Lab	Fan 60 w	Tube light			CFL 18x2 w	LED 15 w	LED 9 w	PC	Printer	Scaner	Monitor	Water Cooler	Exhaust Fan	Wall Fan	AC Split	Oven	Oven	sodium lamp
			T5	36	LED 20												2000w	1000 w	250w
	Ground Floor																		
1	SC-004	1	1	1					3						1				
2	SC-006	1			2				1	1									
3	SC-005	1			2				1	1									
4	Porch				1														
5	Gentes Toilet				1									1					
6	Students Toilet				1									1					
7	Class Room	6			8														
8	Class Room	6	1	6	6														
9	Chemistry Lab	1			2														
10	Chemistry Lab	6		8	3									2			2	1	
11	Staff Room	1		3	1				1										
12	Class Room	2		1	2														
13	Staff Room	3	2	2	1				4										
14	Class Room	9	1			16													
15	Passage				4								1						
	First Floor																		
16	Cabin	1		2					3	1					2				
17	Cabin	1		2					1	1	1	1							
18	Cabin	1		1	1				2	1					1				
19	Toilet Gents				1									2					
20	Ladies Toilet				1									1					
21	Class Room	7		4	2														
22	Lab	6		9	3				1								1		
23	Class Room	10				16													
24	Lab	6	1	8	3														
25	Dark Room	2		2										1					5
26	Staff Room	1	1	2					1										
27	Lab			1															
28	Lab	1		2					1										
29	Lab	2	2											1					4
30	Passage			2	2														
	Second Floor																		
31	Room no-205	2		1	2				2	1									
32	Room no-206	1			2				1						1				
33	Room no-207	1	1		1				2	1									
34	Room no-208	7	2	3	2														
35	Gentes Toilet				1									1					
36	Students Toilet				1									1					
37	Language Lab	6					12		36	1						3			
38	Class Room	7	1	2	3														
39	Class Room	10				12													
40	Class Room	9		1	4														
41	First year co-or	1					3												
42	Passage	1	2		3														
	Third Floor																		
43	Toilet Gents				1									1					
44	Ladies Toilet				2									2					
45	Staff Room	4						7	5										
46	Class Room	7						15											
47	Room 304	5						3											
48	Room 303	9						15											
49	Room310	9						15											
50	Room 311	5						12											
51	Room 301	9						16											
52	Room 302	7						6	5	1									
53	**Total**	175	15	63	69	44	15	89	70	9	1	1	1	14	5	3	3	1	9
54	**Watts**	60	28	36	20	36	15	9	150	100	100	100	1500	300	60	2000	2000	1000	250
55	**Total Watts**	10500	420	2268	1380	1584	225	801	10500	900	100	100	1500	4200	300	6000	6000	1000	2250
56	**Per day Hrs**	7	7	7	7	7	7	7	7	1	1	24	7	12	7	7	2	2	2
57	**Per MonthKWH**	1764	71	381	231.8	266	38	135	1764	22	2.4	57.6	252	1210	50.4	1008	288	48	108

Table No .27: List of Electrical Equipments at Department of Mechanical

Sr no.	Name of Lab	Fan 60 w	Tube light				CFL 36x	CFL 18x2 w	PC	Printer	Projector	Monitor	Water Cooler	Exhaust Fan	Window AC	AC Split	2x10 x M/C	Sanitary M/C
			T5	36	36x2	20												1000
	Ground Floor																	
1	Mech Dept. Library	4		6		2			3	1								
2	Toilet 010					1								1				
3	Toilet 009					1								1				
4	Lab	4		1	3	2			3									
5	Class Room	2		2					1									
6	Cad Lab	11						24	36	1	1					3		
7	**First Floor**																	
8	HOD Office 109	2		1		1			1			2				1		
9	Staff Room 107	1				2			1	1								
10	Room No 108	1		2													1	
11	Class Room 106	8					6		1		1							
12	Class Room 101A	2		3														
13	Class Room 101B	2		2		2												
14	Staff Room 102	2	1	1		2			6	1								
15	enter of Excellance 105A+	2		6			6		10						4			
16	Lab 103	4		6														
17	Lab 104A	2	1			1												
18	Lab 104	5		10														
19	Passage	1		1		1							1					
20	Toilet Ladies 111					1								1				
21	Gentes Toilet 110			1										1				
	Second Floor																	
22	Class Room 206	5	3	4		1												
23	Class Room 202	7	1	5														
24	Class Room 205	5		3		3												
25	Class Room 201	9						11										
26	Class Room 204	7		4		5								1				
27	Staff Room 203	2	1	1		2			3									
28	Staff Room 209	2				2			3									
29	Room No 208	1		1		1												
30	Room No 207	1		1		1												
31	Toilet 210					1								1				
32	Toilet 211					1								1				
	Third Floor																	
33	Class Room 307	9				10												
34	Class Room 303	9				9												
35	Class Room 306	9				10												
36	Class Room 305	9				10												
37	Class Room 301	9				10												
38	Class Room 302	6				2			9									
39	Class Room 304	2				2			1	1								
40	Passage					6												
41	Boys Toilet					1												
42	Toilet 309					1												2
43	Staff Room 308	4				2												
44	**Total**	149	7	61	3	96	12	35	78	5	2	2	1	7	4	4	1	2
45	**Watts**	60	28	36	72	20	72	36	150	100	100	100	1500	300	2000	2000	500	1000
46	**Total Watts**	8940	196	###	216	###	864	1260	11700	500	200	200	1500	2100	8000	8000	500	2000
47	**Per day Hrs**	7	7	7	7	7	7	7	7	1	1	24	7	12	7	7	1	1
48	**Per MonthKWH**	1502	33	369	36	323	145	212	1966	12	4.8	115	252	604.8	1344	1344	12	48

Table No .28: List of Electrical Equipments at Department of Electrical

Sr no.	Name of Lab	Fan 60 w	Tube light		LED	LED 15 w	LED 12 w	CFL 36x2	CFL 18x2 w	PC	Printer	Projector	Wall Fan	Exhaust Fan	AC Split	Motor 5 hp	Load 5 kw	Rehostate 500 w	Load 10 kw	Rheostate
			T5	36	20															
1	Ground Floor																			
2	EL 001	2		1	2					2										
3	EL 002	8			9					10										
4	EL 003	2				2	2		9	3	2				1					
5	EL 004	4							12						2					
6	EL 005	4	1	5	26					26		1			2					
7	EL 012	4		7																1
8	EL 006	10	8	4	1					1						30	2	4	1	
9	EL 011	2																		
10	EL 007 A+B	8			40				24	40		1								
11	EL 010	2		8									7	2						
12	EL 008	4		10	1					1							1			
13	EL 009	4	1	7	1					1						8				
14	Passage			1																
15	Toilet & Pannel													1						
16	EL 101	2		1	2					2										
17	EL 102	4		6																
18	EL 103	7																		
19	Toilet 114 A													1						
20	Room No 202	2			4			5		4	2									
21	Staff Room	2			4			6		4			3							
22	Class Room 204	5		1																
23	EL 205 B	12	13																	
24	EL 212																			
25	EL 205A	6												1						
26	EL 213 B																			
27	EL 206	5																		
28	EL 207	6																		
29	EL 208	5		2																
30	Passage																			
31	El 307	4							6											
32	?ower Electronics Lal	5				5			5											
33	EL 310	5							7											
34	EL 311	7							9											
35	EL 312	2							8											
36	EL 308	4				2			6											
37	Passage					1			3											
38	Girls Toilet				1															
39	El 304	8		6	2															
40	Total	145	23	59	93	10	2	11	89	94	4	2	10	5	5	38	3	4	1	1
41	Watts	60	28	36	20	15	12	72	36	150	100	100	60	300	2000	3730	5000	500	10000	200
42	Total Watts	8700	644	2124	1860	150	24	792	3204	14100	400	200	600	1500	10000	1E+05	15000	2000	10000	200
43	Per day Hrs	7	7	7	7	7	7	7	7	7	1	1	7	12	7	2	2	2	2	2
44	Per MonthKWH	1462	108	357	312	25	4	133	538	2369	9.6	4.8	101	432	1680	6804	720	96	480	9.6

Table No .29: List of Electrical Equipments at Admin Building

Sr no.	Name of Lab	Fan 60 w	Tube light			LED	LED 15 w	LED 20 w	LED 12 w	CFL 1x18 w	LED 5 w	LED 9 w	CFL 36x2	CFL 18x2 w	PC	Printer	Projector	Monitor	Wall Fan	Table Fan	Water Cooler	RO	Exhaust Fan	AC Split	Zerox M/C	Ducting Cooler	Scaner	Freez	Table AC	TV
			T5	36	2x36	20																				2 HP				
1	AD 105		1																		1	1								
2	Principal Office	2	3				9	1							1	1								1						
3	AD 115					1				4					1	1														
4	AD 103	1							4										1											
5	AD 104	1	1	1																			1							
6	AD 102	1		4					6						2	1								1						
7	AD 101	1												6	1	1								1						
8	Passage	2	3			3	2				10	3																		
9	Porch					2						8																		
10	Information Res	4		9								4																		
11	Wankhede mad	1		2											2	1								1						
12	AD 120	16		5		34								11	41				2	1						4				
13	Library	14		8		24																								
14	AD 014	2		2		1																								
15	Thakre Sir	1				1									4	1											1			
16	AD 013	9		15		9													1				1		1					
17	AD 222	1												4	1	1								1						
18	Passage	2				2								4																
19	AD 212	1												4	1	1								1						
20	AD 213																		1											
21	AD 213 B																		1											
22	AD 214	1												4	1	1								1						
23	AD 215	1												4	1	1								1						
24	AD 216	1												4	1	1								1						
25	AD 217	1												4	1	1								1						
26	AD 218	1		1																								1		
27	Passage						1							5																
28	AD 211					2																	1							
29	AD 221	11		12																										
30	Stear Case Library			3																										
31	AD 118		1																											
32	Porch			2																										
33	AD 201	2											2		1	1								1						
34	Students Placen	2											2											1						
35	AD 202	4											6		3	1														
36	Electrical Engg I	9			12									11					4											
37	Inovetion Galler	6									63	15												4						
38	Passage			2										3					2											
39	Main Passage	2												9																
40	Admin Office	11				2	12							16	16	13			4	1						2				
41	Passage	3					1	3						4	1										1					
42	Toilet					2																	1							
43	A O Office	1												5	1	1								1				1		
44	AD 005	1				1								4				1												
45	Record Room	2				2																								
46	ERP 006	2		2		2									6	2								1						
47	Scholership Sec	2						1						2	2	1														
48	Admission Roo	4	9				1							6	4										1				2	1
49	Board Room	6					26											1						2						1
50	**Total**	132	18	68	12	88	52	5	10	4	73	30	10	110	92	31	1	1	16	2	1	1	4	20	3	6	1	2	2	2
51	**Watts**	60	28	36	72	20	15	20	12	18	5	9	72	36	150	100	100	100	60	60	1500	100	300	2000	500	1492	100	500	2000	200
52	**Total Watts**	7920	504	2448	864	1760	780	100	120	72	365	270	720	3960	13800	3100	100	100	960	120	1500	100	1200	40000	1500	8952	100	1000	4000	400
53	**Per day Hrs**	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1	1	24	2	2	7	7	12	7	7	4	1	7	4	2
54	**Per MonthKWH**	1331	85	411.3	145	296	131	17	20	12	61	45	121	665	2318	74.4	2.4	57.6	46.1	5.76	252	16.8	345.6	6720	252	859.4	2.4	168	384	19

Table No .30: Monthly utilization of Electricity

Sr. No.	Months /Year	Total Units	Amount
1	Jan-17	350	106220
2	Feb-17	350	106220
3	Mar-17	350	106220
4	Apr-17	350	116325
5	May-17	350	128250
6	Jun-17	350	101750
7	Jul-17	350	101750
8	Aug-17	350	101750
9	Sep-17	350	96250
10	Oct-17	350	96250
11	Nov-17	350	107000
12	Dec-17	350	96250
13	Jan-18	350	96250
14	Feb-18	350	96250
15	Mar-18	350	96250

Table No .31: Carbon Footprint based on Electrical Consumption

Sr. No.	Months /Year	Total Units	Amount (Rs)	CO_2 Emission kt
1	Jan-17	350	106220	280
2	Feb-17	350	106220	280
3	Mar-17	350	106220	280
4	Apr-17	350	116325	280
5	May-17	350	128250	280
6	Jun-17	350	101750	280
7	Jul-17	350	101750	280
8	Aug-17	350	101750	280
9	Sep-17	350	96250	280
10	Oct-17	350	96250	280
11	Nov-17	350	107000	280
12	Dec-17	350	96250	280
13	Jan-18	350	96250	280
14	Feb-18	350	96250	280
15	Mar-18	350	96250	280

VII] Energy Audit: B) Solar Audit

The sun is an incredible and renewable resource that has the power to fuel life on earth and provide clean, sustainable energy to all of its inhabitants. In fact, more energy from the sun reaches our planet in one hour than is used by the entire population of the world in one year. The potential for solar energy is enormous, since about 200,000 times the world's total daily electric-generating capacity is received by Earth every day in the form of solar energy. The college campus is having Solar panels installed on rooftop of each of the departmental building. The electricity generated is further directed to the adjacent polytechnic college premises where the required electric energy is utilized and the remaining unutilized is led to the powergrid. The data regarding Solar energy generation was measured to understand the solar energy potential at YCCE campus.

Table No .32: Solar Energy Potential and CO_2 Emission

Sr. No.	Bill Month	Roof top solar net metering capacity (kW)	Total Solar Energy Generation	Emission Factor	CO_2 Emission kt
1)	Oct-2018	400.00	60213.00	0.8	48170.4
2)	Sep-2018	400.00	210117.00	0.8	168094
3)	Aug-2018	400.00	49619.00	0.8	39695.2
4)	Jul-2018	400.00	51689.00	0.8	41351.2
5)	Jun-2018	400.00	86045.00	0.8	68836
6)	May-2018	400.00	85959.00	0.8	68767.2
7)	Apr-2018	400.00	92760.00	0.8	74208
8)	Mar-2018	400.00	60149.00	0.8	48119.2
9)	Feb-2018	400.00	45569.00	0.8	36455.2
10)	Jan-2018	400.00	43197.00	0.8	34557.6
11)	Dec-2017	400.00	37498.00	0.8	29998.4
12)	Nov-2017	400.00	39766.00	0.8	31812.8
13)	Oct-2017	400.00	41877.00	0.8	33501.6
14)	Sep-2017	400.00	42264.00	0.8	33811.2
15)	Aug-2017	400.00	43228.00	0.8	34582.4
16)	Jul-2017	400.00	6968.00	0.8	5574.4
17)	Jun-2017	400.00	0.00	0.8	0
18)	May-2017	400.00	0.00	0.8	0
19)	Apr-2017	400.00	0.00	0.8	0

VII] Energy Audit: C) Sound Audit

Sound is all around us and can be measured to inform and protect us, as some sounds are not safe. In fact, loud noise can be very damaging to hearing. The level of noise, where a person is in relation to the noise (distance to the noise), and the amount of time they listen to it can all result in risk for hearing loss. Sound can be measured with a device called a decibel meter. Sound is measured in units called decibels (dB). A Sound Level Meter (SLM) is an instrument (commonly hand-held) that is designed to measure sound levels in a standardized way.

The noise level was measured at different locations within the campus to understand the noise pollution level points and the calm zones. This help understand the sound level conforms to the prescribed range in daytime and night time in the educational institute.

Satellite Imagery No. 10: Sampling Locations of Sound Level Component

Table No .33: Sound Level Standard

CPCB Standards of Noise Levels					
Rural	**Sub-Urban**	**Residential (Urban)**	**Urban (Residential & Business)**	**City**	**Industrial**
25-35	30-40	35-45	40-50	45-50	50-60

Table No .34: Noise Quality Standards

Sr. No.	**Category of Area**	**Noise level in Leq dB (A)**	
		Day Time	**Night Time**
1)	Industrial Area	75	70
2)	Commercial Area	65	55
3)	Residential Area	55	45
4)	Silence Zone	50	40

Source: Notification of MoEF, dated 26-12-1989

Note:

1. Day time is reckoned between 6 a.m − 10 p.m
2. Night time is reckoned between 10 p.m − 6 a.m
3. Silence Zone is defined as areas upto 100 m around premises as hospitals, educational institutions and courts. The silence zones are to be declared by Competent Autority. Use of vehicular horns, loudspeakers and bursting of crackers shall be banned in these Zones.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the Corresponding standards shall apply.

Table No .35: WHO Guidelines for Sound Level

Specific Environment	Time Base (hours)	Standards limits as per WHO guidelines	
		LAeq (dB)	LAmax,fast (dB)
Outdoor living area	16	50-55	-
Dwelling , indoors, inside bedrooms	16	30	-
	8	35	45
Outside Bedrooms	8	45	60
School Classrooms and preschool , indoors	During class	35	-
Preschool bedrooms,indoors	Sleeping time	30	45
School playground, outdoors	During play	55	-
Hospital, ward rooms, indoors	8	30	40
	16	30	-
Hospital , Treatment rooms , indoors	-	As low as possible	-
Industrial Commercial, shopping and traffic areas, indoors and outdoors	24	70	110
Ceremonies, festivals and entertainment events	4	100	110
Public addresses, indoors and outdoors	1	85	110
Music through headphones and earphones	1	85 (under	110

		headphones, adapted to free-field valued)	
Impulse sounds from toys , fireworks and firearms	-	-	120-140 (peak sound pressure) not LAmax, fast), measured 100mm from the car)
Outdoor in parkland and conversation areas	-	Exiting quite outdoor areas should be preserved and the of intruding noise to natural background sound should be kept low	-

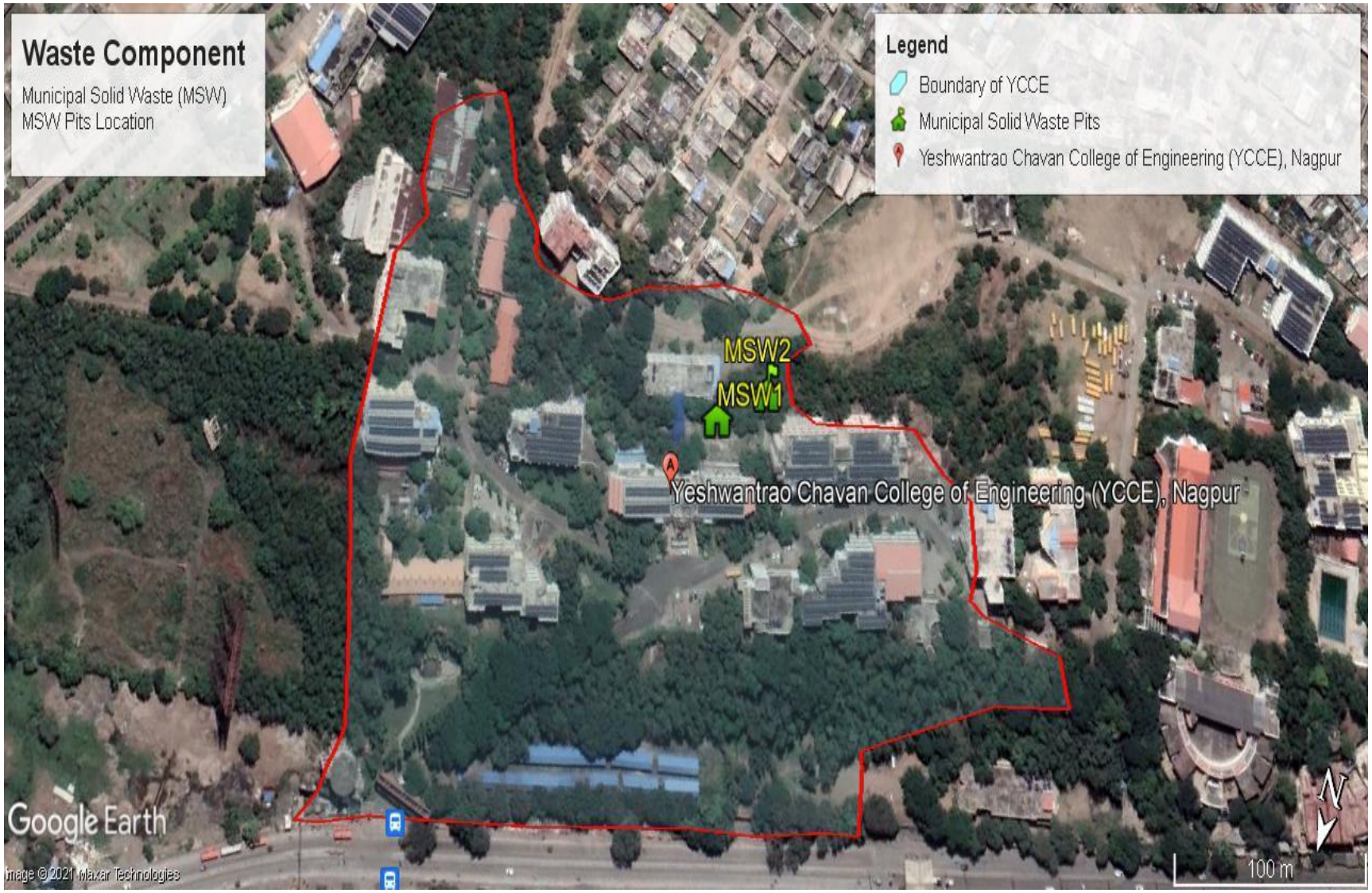
Source: http://cpcb.nic.in/who-guidelines-for-noise-quality

Table No .36: Quantitative Characteristics of Noise Level at YCCE

Sr. No.	Locations	Noise level (Day Time)	Noise level (Night Time)
1)	Location 1	63 dB	55 dB
2)	Location 2	60 dB	50 dB
3)	Location 3	67 dB	50 dB
4)	Location 4	68 dB	53dB
5)	Location 5	62 dB	57 dB
6)	Location 6	65 dB	52 dB
7)	Location 7	64 dB	51 dB

Solid waste refers to the range of garbage materials arising from animal and human activities that are discarded as unwanted and useless. Solid waste is generated from industrial, residential, and commercial activities in a given area, and may be handled in a variety of ways. As such, landfills are typically classified as sanitary, municipal, construction and demolition, or industrial waste sites. The Municipal Solid Waste data was generated with due consideration to the number of individuals per department and the duration of day they spend at each of the department.

Institutional Municipal Solid Waste (IMSW) Standard Unit =0.147 kg/per person/day



Satellite Imagery No. 11 : Municipal Solid Waste Pit

Institutional Municipal Solid Waste Generation at YCCE

Sr. No	Name of Department	Departmental sub-categories	Number of candidate				Teaching Faculty	Non-Teaching Staff	Total no. of Individuals	Solid waste generated per department (kg)/day
			BE Intake	Graduation Students	M.Tech Total	Ph.d				
1	Administrative Office							122	122	17.93
2	Library							18	18	2.65
3	Applied Science and Humanities					21	34	8	63	9.26
4	Computer Technology	M.Tech.Computer Science and Engineering	120	480	48	8	28	13	577	84.82
5	Electronics Engineering	M.Tech . Electronics Engineering	120	480	67	0	40	15	602	88.49
6	Electronics &Telecommunication Engineering	M.Tech .Communication Engineering M.tech .CAD-CAM	180	720	24	8	35	17	804	118.19
8	Electrical Engineering	M. Tech . Integrated Power Systems	180	720	18	5	42	15	800	117.60
9	Information Technology		60	240	18	9	23	16	306	44.98
10	Mechanical Engineering		180	720	43	10	49	22	844	124.07

11	Civil Engineering	M.Tech . Environmental Engineering M.Tech .Structural Engineering	180	720	43	5	49	14	831	122.16
12	**Total**									**730.15**

Henceforth,

Institutional Municipal Solid Waste generated per day = 730.15 kg

Waste generated for Session 2017-2018 (July2016 to July 20117) = 730.15 kg*365 days

= 266,504.38 kgs

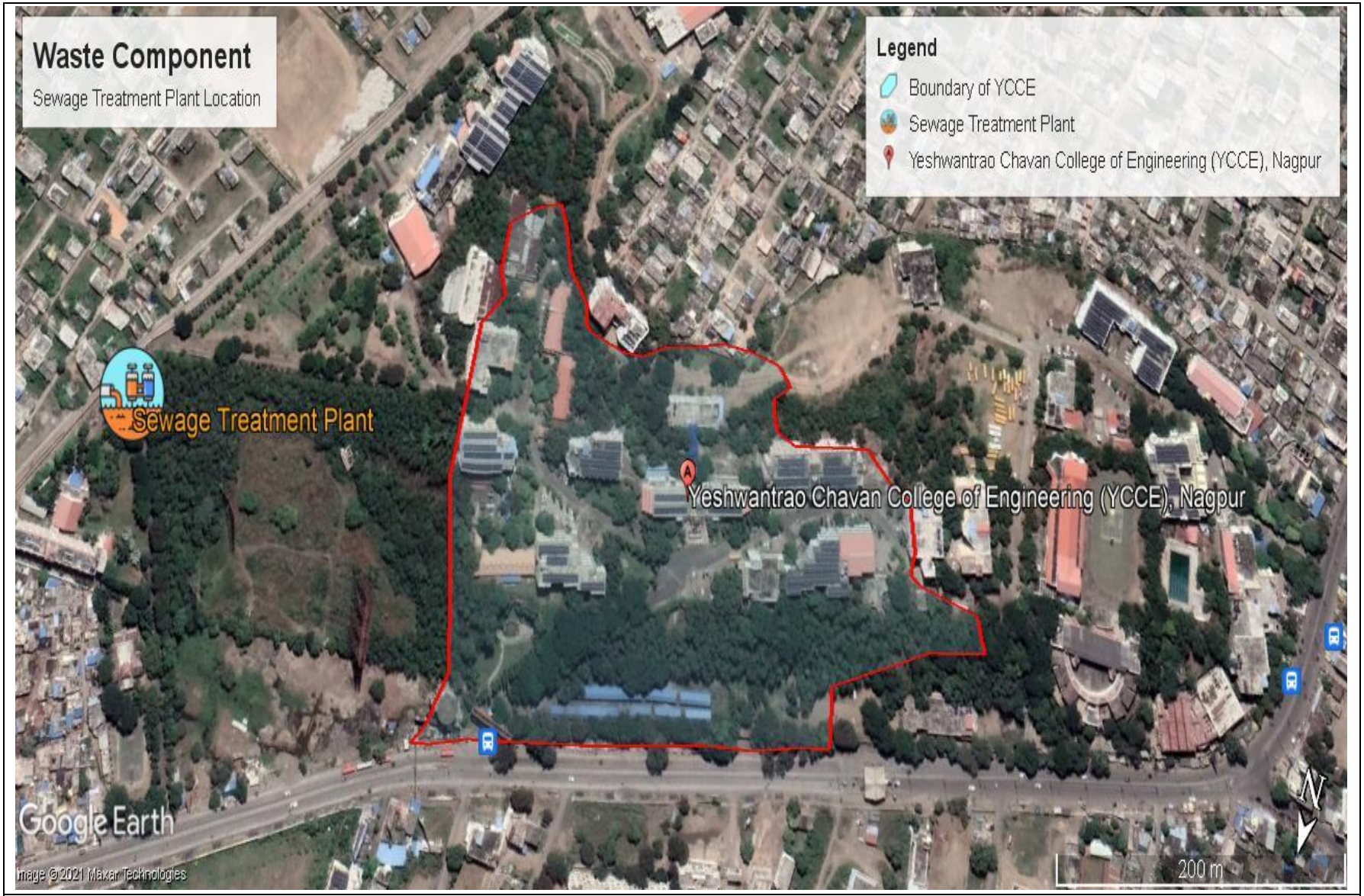
VIII] Waste Generation and Disposal Audit: A) Domestic Wastewater

Wastewater or sewage is the byproduct of many uses of water. There are the household uses such as showering, dishwashing, laundry and, of course, flushing the toilet. The sewer or collection system is designed so that it flows to a centralized treatment location. The collection system is comprised of smaller sewers with a diameter of about four inches.

The YCCE campus has a own Sewage Treatment Plant (STP) with 1,25000 lpd capacity with the regeneration of treated water further subjected to gardening and wahing as well as flushing activities.

The STP has inclusion of unit processes:

1) Primary Treatment
2) Secondary Treatment and
3) Tertiary Treatment



Satellite Imagery No. 12: Sewage Treatment Plant Location

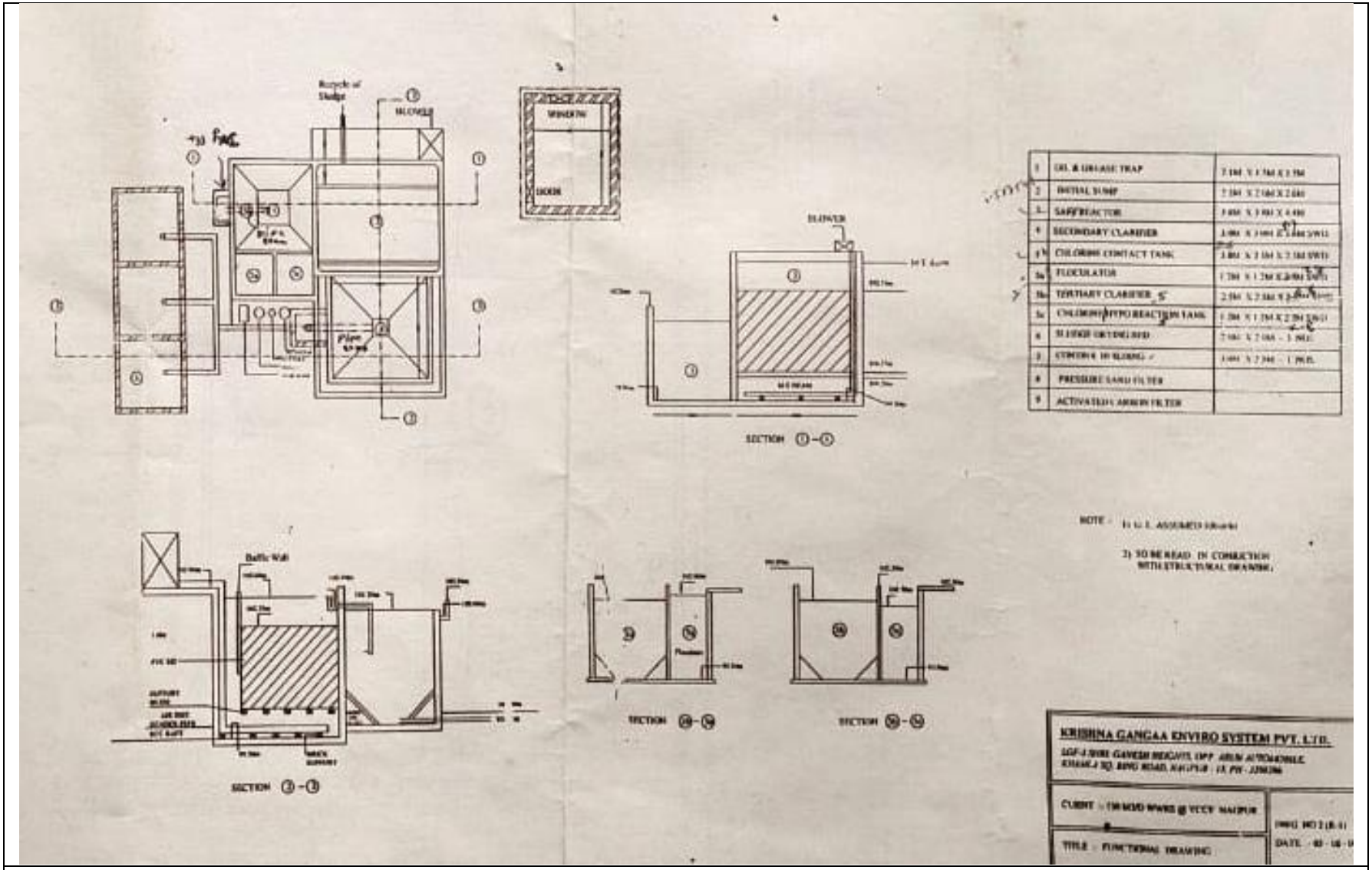


Image No. 2: Sewage Treatment Plant Design and Description

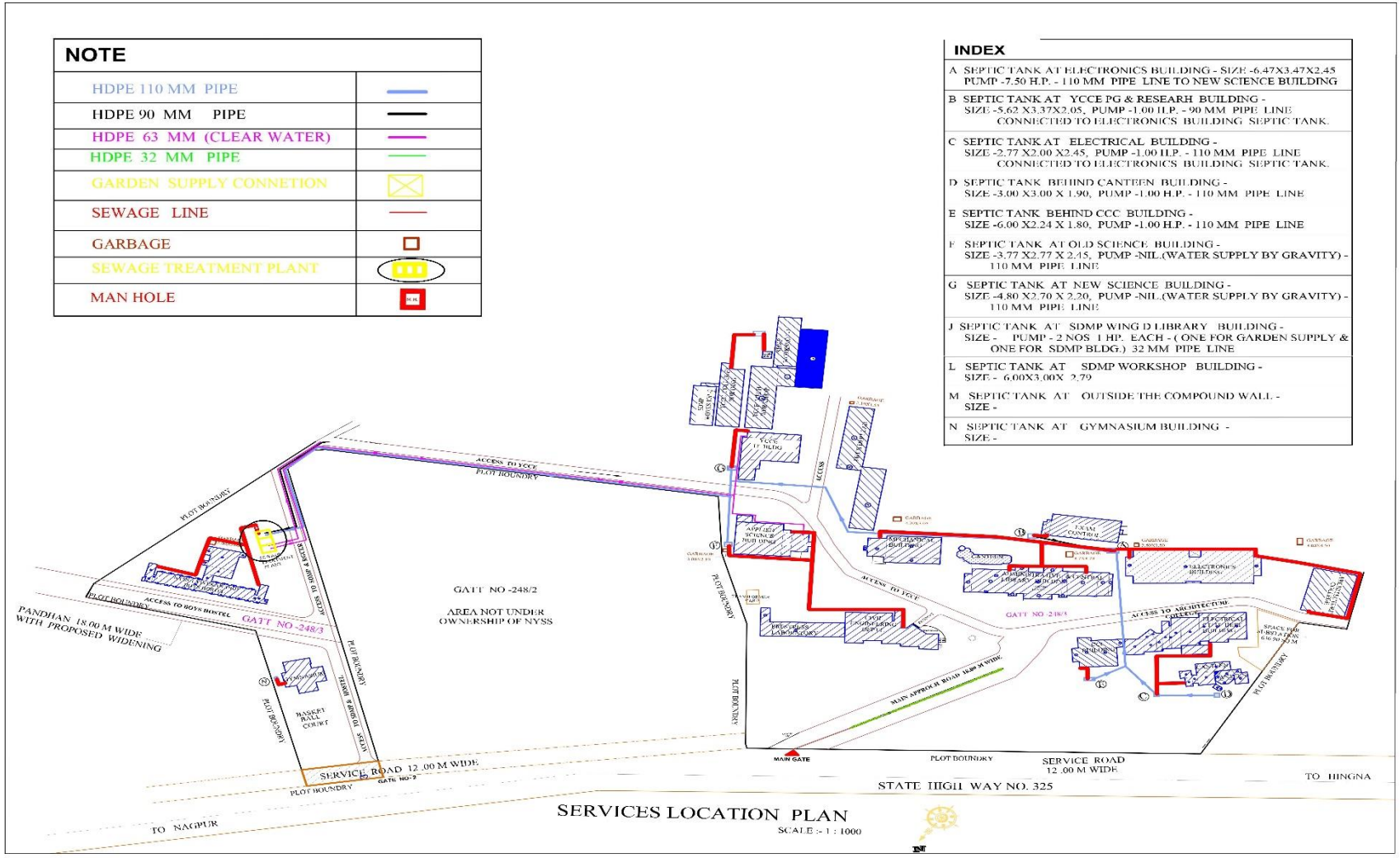


Image No. 3: Sewer Line Drainage Map

Table No .37: Sewage Standards

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE New Delhi, the 13th October, 2017				
Sr. No.		**Parameters**	**Standards** **Effluent discharge standards (applicable to all mode of disposal)** **Location**	**Concentration not to exceed**
			(a)	(b)
1)	Sewage Treatment Plant	pH	Anywhere in the country	6.5-9.0
2)		Bio-Chemical Oxygen Demand (BOD)	Metro Cities*, all State Capitals except in the State of Arunachal Pradesh, Assam, Manipur, Meghalaya Mizoram, Nagaland, Tripura Sikkim, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, and Union territory of Andaman and Nicobar Islands, Dadar and Nagar Haveli Daman and Diu and Lakshadweep	20-30
3)		Total Suspended Solids (TSS)	Same as above [(2)-BOD]	50-100
4)		Fecal Coliform (FC) (Most Probable Number per 100ml, MPN/100ml	Anywhere in the country	<1000

Table No .38: Qualitative and Quantitative Characteristics of Sewage at YCCE

Sr. No.	Parameters	Unit	Result		Limit	Method Reference
			STP Inlet	STP Outlet		
1	pH	–	7.3	7.5	–	APHA 23rd Ed. 2017, 4500-H^+- B, 4-95
2	Total Dissolve Solids	mg/L	328	297	–	IS 3025 (Part 16): 1984 Reaffirmed 2006, Ed.2.1 (1999-12)
3	Total Suspended Solids	mg/L	47	32	100 Max	APHA 23rd Ed. 2017, 2500-D, 2-70
4	Chlorides (as Cl^-)	mg/L	44	30	–	APHA 23rd Ed. 2017, 4500-Cl- B, 4-75
5	Sulphates (as SO_4)	mg/L	49.4	52.8	–	APHA 23rd Ed. 2017, 4500-SO4-E,4-199
6	Dissolved Oxygen	mg/L	4.9	5.6	–	APHA 23rd Ed. 2017, 4500-O,B,4-144&C,4-146
7	Bio-chemical Oxygen Demand	mg/L	11..3	4.2	100 Max	IS 3025 (Part 44): 1993, Reaffirmed 2009
8	Chemical Oxygen demand	mg/L	38	19	–	APHA 23rd Ed. 2017, 5220-B,5-18

Sewage Treatment Plant

Sedimentation Tank

Photograph No. : Sewage Treatment Plant

VIII] Waste Generation and Disposal Audit: B) Biogas Technology Audit

The college campus has two canteens, with their own individual mess, where daily generated kitchen waste is subjected for Biogas generation. For harnessing the maximum energy pre-digester tank in which any type of kitchen waste, manure etc. is fermented, has been installed. In order to maintain the temperature of biogas plant the solar water heater fully home made using copper coil and glass has also been used. Biodigester consist a plastic tank of capacity 1000 liters. The retention time period for production of gas is about 30-45 days depending upon season, temperature and many other environmental factors.

Digester tank

Biogas Plant

Use of food crusher helps in reducing the solid contents in the feedstock, which makes the anaerobic digestion process faster, resulting in increase in output of gas. In Biogas model by considering the size and capacity of the digester tank by 7 Kg of feedstock daily. The feedstock is fed daily and in 1:2 proportion with water and feedstock. Since bacteria in the digester have very limited reach to their food it is necessary that slurry is properly mixed and bacteria get their proper supply. The biogas generation process is highly depends upon the C/N ratio of the feedstock. Higher the C/N ratio higher will be the production. The temperature affects in large extent to the gas production. It is found that the production of gas is faster in summer days as compared to winter days.

Green Initiatives/ Activities in Campus

- ✓ Mass Plantation drive
- ✓ Plastic collection day in campus
- ✓ Interactive sessions for students to explore and channelize the young for environmental conservation
- ✓ Environment friendly and safe disposal of E-waste
- ✓ Conversion of Canteen waste to energy used in laboratory
- ✓ Sustainable construction of buildings
- ✓ Display board of conservation and prevention of resources within the campus for awareness
- ✓ Expert talks on Environmental Conservation practices
- ✓ Surface water run-off recharge to the well
- ✓ Solar Energy conversion

Suggestions

1) Plastic waste management needs to be practiced efficiently.
2) Regular check should be done at STP in regard of inlet and outlet wastewater characteristic parameters to maintain the work efficiency of STP.
3) Implementation of proper municipal solid waste management plan is essential.
4) Ecosystem of the college should be managed properly. Snails spreaded all over the garden, great concern for biodiversity.
5) Each of the trees and plants should be numbered and their scientific classification in regards of common name, genus and scientific name should be displayed.
6) Fallen twigs and leaves can be used for bio-composting and the manure can be produced by integrating students in these practices.
7) A piece of land could be dedicated for organic farming and the students could be motivate to take responsibility to maintain the same during their physical activity hours.