

GREEN AUDIT REPORT

of

Sahyadri Bahujan Vidya Prasarak Samaj,

Loknete Balasaheb Thorat Arts, Commerce & Science College,

Talegaon Dighe, Taluka: Sangamner, District: Ahmednagar



Year: 2020-21

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com



REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942


National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.


This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India 
Controller of Examination

Date : 10th August 2007

BEE ENERGY AUDITOR CERTIFICATE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY
As ISO 9001 : 2002 Reg. No. 9029114662


Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandry,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: gee@maharaja.com, Web: www.maharaja.com

ECN/2021-22/CR-14/1577 22nd April, 2021

**CERTIFICATE OF REGISTRATION
FOR CLASS 'A'**

We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Enrich Consultants
Yashastree, Plot No. 26, Nirmal Bag Society,
Near Muktagan English School, Parvati,
Pune - 411009.

Registration Category : Empanelled Consultant for Energy Conservation Programme for Class 'A'

Registration Number : MEDA/ECN/2021-22/Class A/EA-03

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **21st April, 2023** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.


General Manager (EC)

MEDA EMPANELMENT CERTIFICATE

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ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of Sahyadri Bahujan Vidya Prasarak Samaj, Loknete Balasaheb Thorat Arts, Commerce & Science College, Talegaon Dighe, Taluka: Sangamner, District: Ahmednagar, for awarding us the assignment of Green Audit of their College Campus for the Year: 2020-21.

We are thankful to all staff members for helping us during the field study.



EXECUTIVE SUMMARY

1. Sahyadri Bahujan Vidya Prasarak Samaj, Loknete Balasaheb Thorat Arts, Commerce & Science College, Talegaon Dighe, consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Energy Consumed and CO₂ Emission:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	296	0.27
2	Maximum	34	0.03
3	Minimum	3	0.00
4	Average	24.67	0.02

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings & Maximum Usage of Day Lighting

4. Usage of Renewable Energy Source:

- The College has yet to install Solar PV Plant.

5. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are kept at various points.

5.2 Liquid Waste Management:

The College has installed a Septic Tank and is cleaned periodically.

6. Rain Water Management:

The rain water falling on the terrace is collected in a Storage Tank and used for domestic purpose, after filtration.

7. Green & Sustainable Practices:

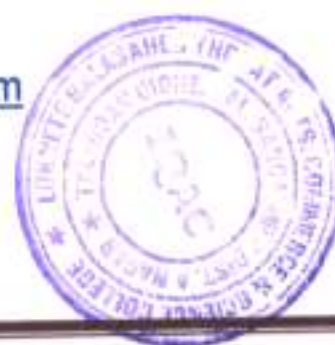
- Good Internal Road & Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness about 3 R's Reduce, Recycle & Reuse by Display of Posters

8. Assumption:

- 1 kWh (Unit) of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

9. Reference:

- For CO₂ calculations: www.tatapower.com



ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO ₂	:	Carbon Di Oxide



CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO₂ emissions
3. To study Usage of Renewable Energy
4. To study Waste Management practices
5. To study Green & Sustainable Practices

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Loknete Balasaheb Thorat Arts, Commerce & Science College,
2	Address	Talegaon Dighe, Taluka: Sangamner, District: Ahmednagar
3	Affiliation	Savitribai Phule Pune University

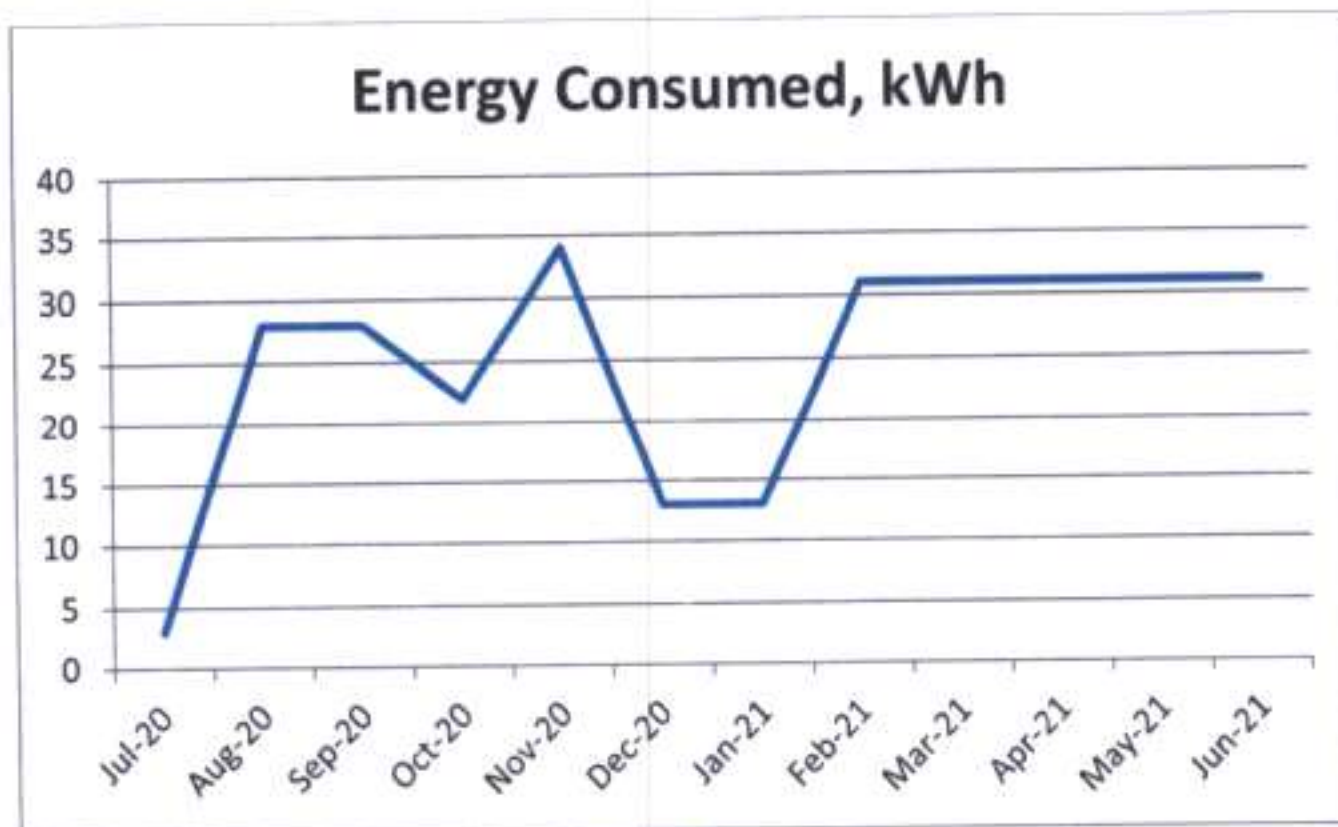


CHAPTER-II STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Energy Consumption
Table No 2: Electrical Energy Purchase Analysis- 20-21:

No	Month	Energy Consumed, kWh
1	Jul-20	3
2	Aug-20	28
3	Sep-20	28
4	Oct-20	22
5	Nov-20	34
6	Dec-20	13
7	Jan-21	13
8	Feb-21	31
9	Mar-21	31
10	Apr-21	31
11	May-21	31
12	Jun-21	31
13	Total	296
14	Maximum	34
15	Minimum	3
16	Average	24.67

Chart No 1: To study the variation of Month wise Energy Consumed, kWh:



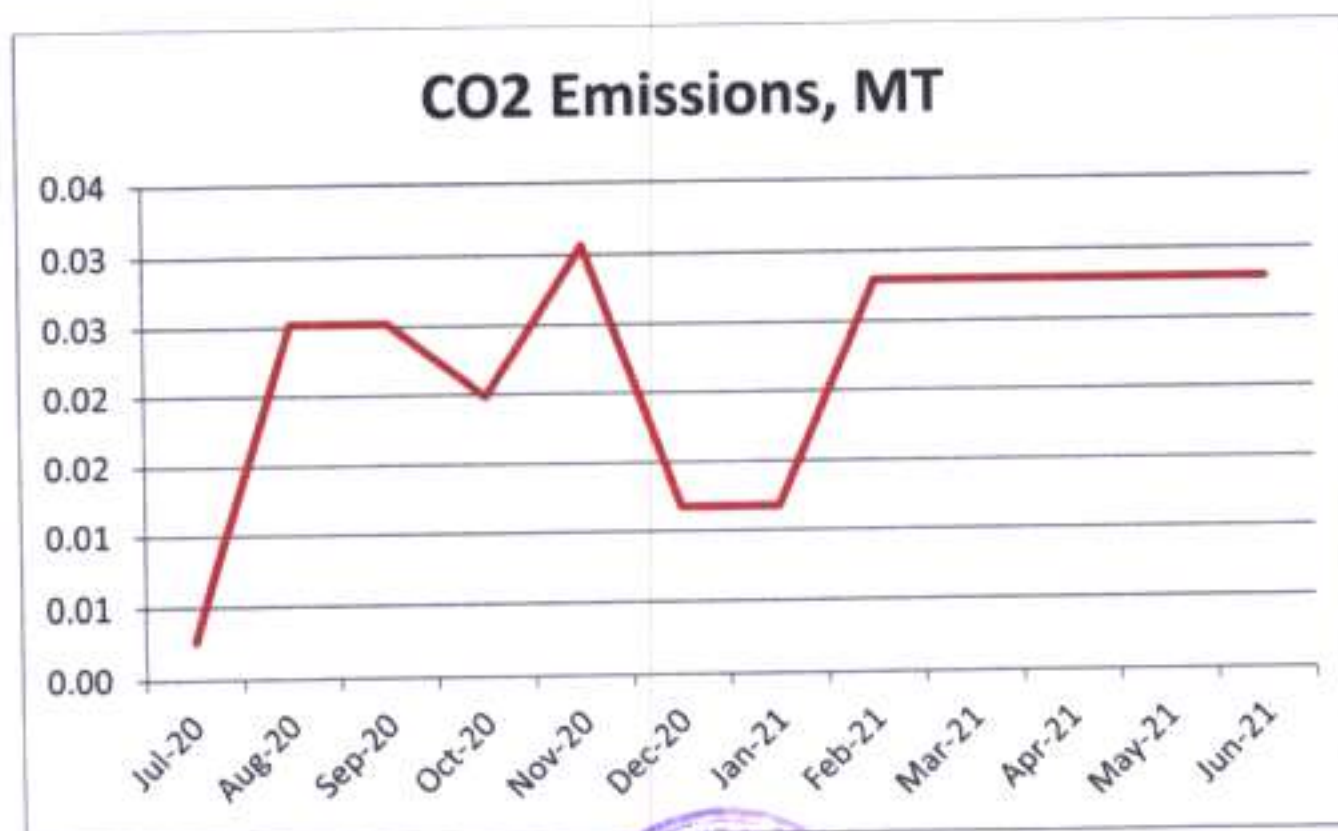
CHAPTER-III CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO₂ Emissions:** 1 Unit (kWh) of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere.

Table No 3: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jul-20	3	0.00
2	Aug-20	28	0.03
3	Sep-20	28	0.03
4	Oct-20	22	0.02
5	Nov-20	34	0.03
6	Dec-20	13	0.01
7	Jan-21	13	0.01
8	Feb-21	31	0.03
9	Mar-21	31	0.03
10	Apr-21	31	0.03
11	May-21	31	0.03
12	Jun-21	31	0.03
13	Total	296	0.27
14	Maximum	34	0.03
15	Minimum	3	0.00
16	Average	24.67	0.02

Chart No 2: Representation of Month wise CO₂ emissions:



CHAPTER-IV

STUDY OF USAGE OF RENEWABLE ENERGY

- The College has yet to install Solar PV Plant.



CHAPTER-V STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are located at various locations

Photograph of Separate Waste Collection Bin:



5.2 Liquid Waste Management:

The College has a Septic Tank, and is cleaned periodically.



CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The Rain water falling on the terrace is collected through Pipes and is collected in the Main Water Storage Tank. This Water is further used for domestic purpose after filtration

Photograph of Rain Water Carrying Pipe:



CHAPTER-VII

STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Road:

The College has well maintained pedestrian road as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus:



7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation.

Photograph of Tree Plantation:



7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for the Divyangajan.

Photograph of Ramp for Divyangajan:



7.4 Creation of Awareness about 3 R's Reduce, Recycle & Reuse:

The College has displayed posters emphasizing on importance of 3 R's Reduce, Recycle & Reuse

Photograph of Poster on 3 R's Reduce, Recycle & Reuse:



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AI-182 8001 8007 Reg. No. 902 91 0402


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No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	296	0.27
2	Maximum	34	0.03
3	Minimum	3	0.00
4	Average	24.67	0.02

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Alternate Energy Source:

- The College has yet to install Roof Top Solar PV Plant.

5. Usage of LED Lighting to Total Lighting Load:

- The LED Lighting Load is **0.22 kW**.
- The Total Lighting Load is **0.42 kW**.
- The percentage of LED Lighting Total Lighting load works out to be **52.38 %**

6. Assumption:

- 1 kWh (Unit) of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

7. Reference:

- For CO₂ Emission Calculations: www.tatapower.com



ABBREVIATIONS

AC	:	Air conditioner
BEE	:	Bureau of Energy Efficiency
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited



CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To Study CO₂ emissions
4. To study Scope for usage of Alternate / Renewable Energy
5. To study usage of LED Lighting

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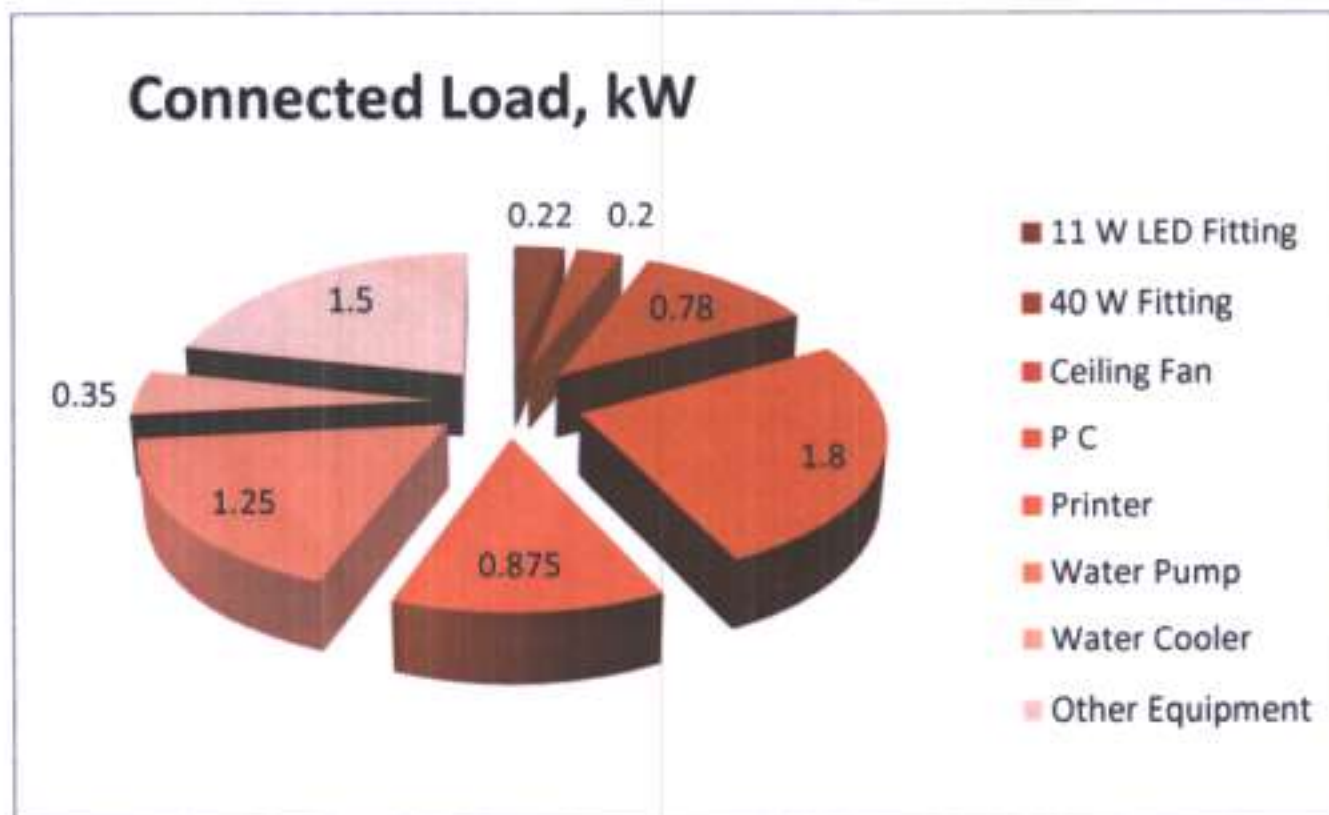
CHAPTER-II STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	11 W LED Fitting	20	11	0.22
2	40 W Fitting	5	40	0.2
3	Ceiling Fan	12	65	0.78
4	P C	12	150	1.8
5	Printer	5	175	0.875
6	Water Pump	1	1250	1.25
7	Water Cooler	1	350	0.35
8	Other Equipment	10	150	1.5
9	Total			6.975

Chart No 1: Details of Connected Load:

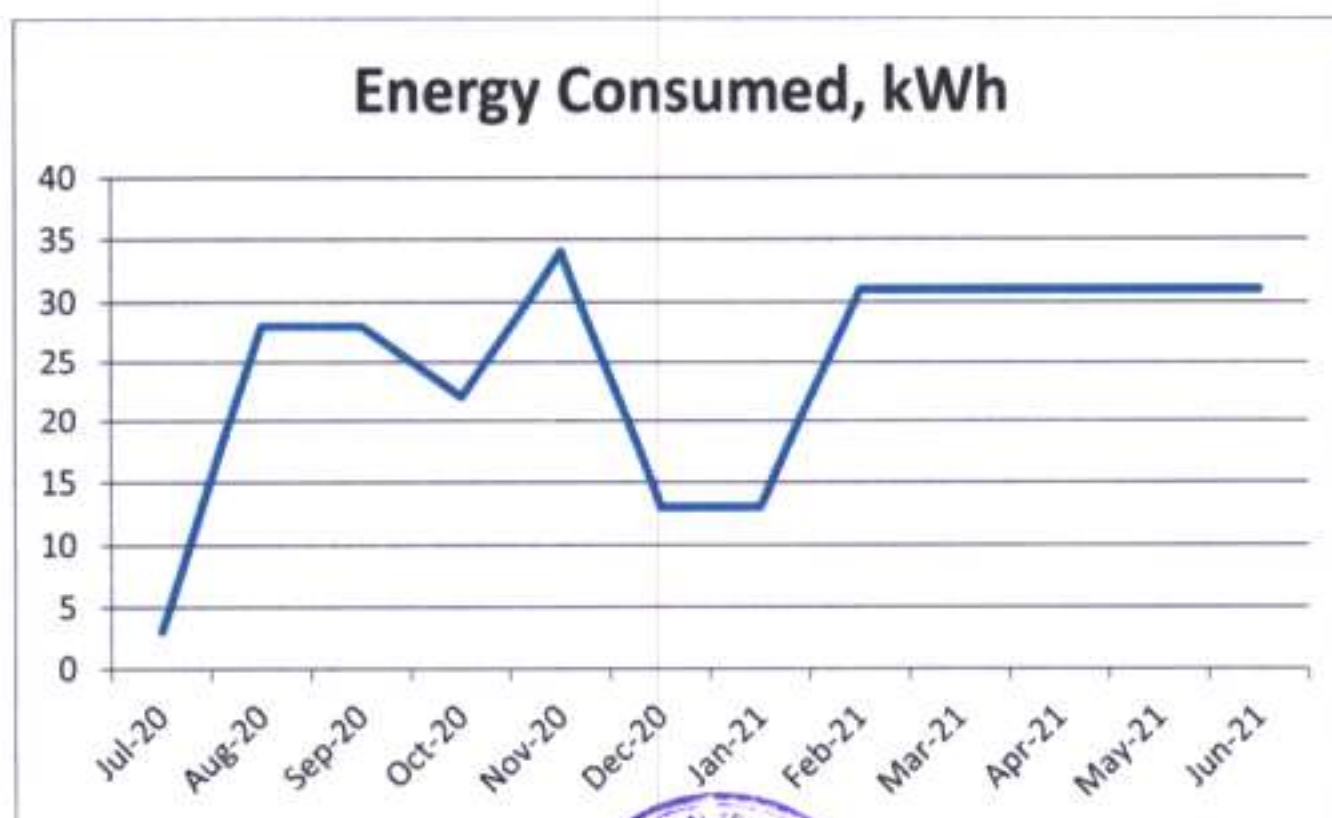


CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Energy Consumed
Table No 3: Electrical Energy Consumed: 2020-21:

No	Month	Energy Consumed, kWh
1	Jul-20	3
2	Aug-20	28
3	Sep-20	28
4	Oct-20	22
5	Nov-20	34
6	Dec-20	13
7	Jan-21	13
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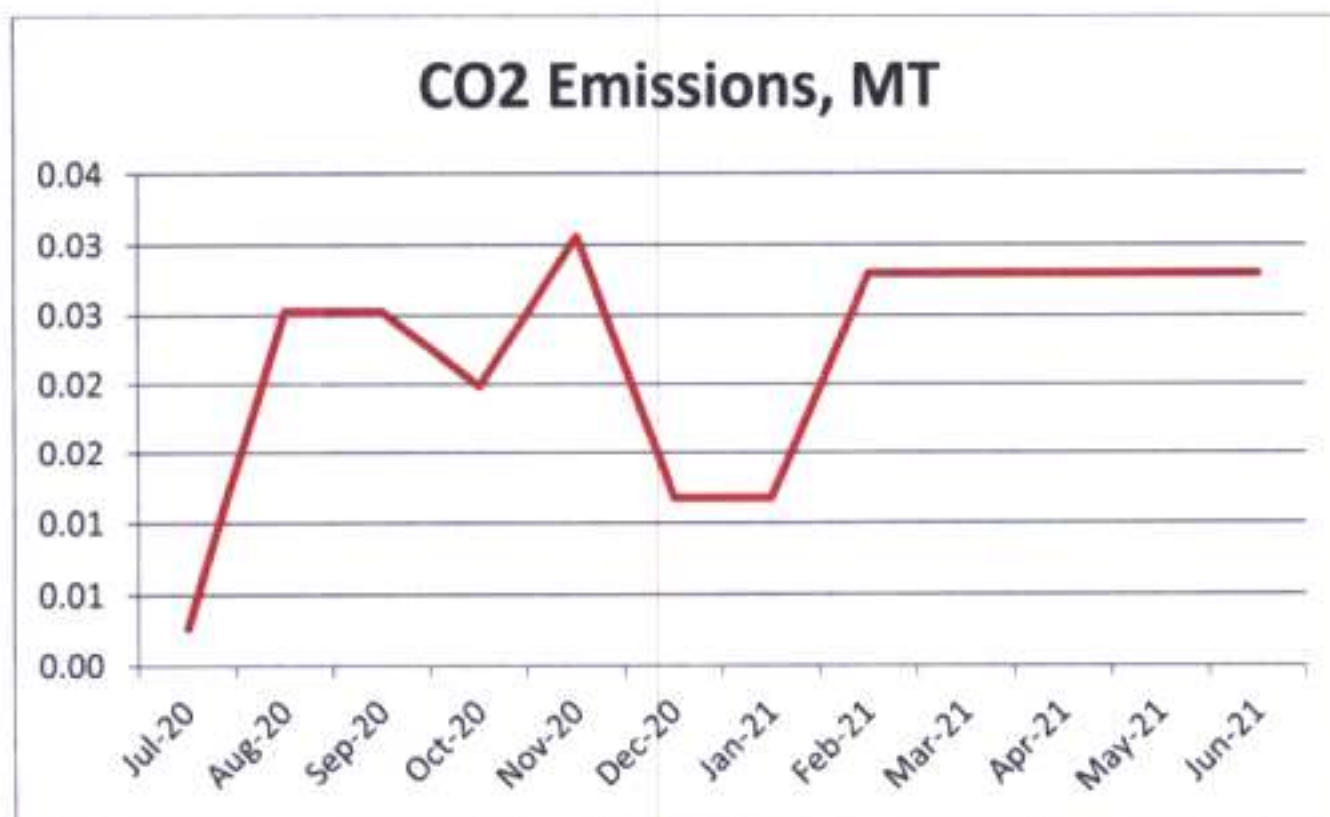
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A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO₂ Emissions:** 1 Unit (kWh) of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere.

Table No 4: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jul-20	3	0.00
2	Aug-20	28	0.03
3	Sep-20	28	0.03
4	Oct-20	22	0.02
5	Nov-20	34	0.03
6	Dec-20	13	0.01
7	Jan-21	13	0.01
8	Feb-21	31	0.03
9	Mar-21	31	0.03
10	Apr-21	31	0.03
11	May-21	31	0.03
12	Jun-21	31	0.03
13	Total	296	0.27
14	Maximum	34	0.03
15	Minimum	3	0.00
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Chart No 3: Representation of Month wise CO₂ Emissions:



CHAPTER-V

STUDY OF USAGE OF ALTERNATE ENERGY

The College has yet to install Roof top Solar PV Plant.



CHAPTER-VI

STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of usage of LED lights to Total Lighting Load.

Table No 5: Study of % LED Lighting Load to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 11 W LED Fitting	20	Nos
2	Load per unit of 11 W LED Fitting	11	W/unit
3	Total Load of 11 W LED Fittings	0.22	kW
4	No of 40 W Fitting	5	Nos
5	Load per unit of 40 W Fitting	40	W/unit
6	Total Load of 40 W Fittings	0.2	kW
7	Total LED Lighting Load= 3	0.22	kW
8	Total Lighting Load= 3+6	0.42	kW
9	% of LED to Total Lighting Load= $7*100/8$	52.38	%



ENVIRONMENTAL AUDIT REPORT

of

Sahyadri Bahujan Vidya Prasarak Samaj,
Loknete Balasaheb Thorat Arts, Commerce & Science College,

Talegaon Dighe, Taluka: Sangamner, District: Ahmednagar



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Registration Number	MEDA/ECN/2021-22/Class A/EA-83
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2. Pollution due to Day to Day Activities:

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Recyclable Waste and Human Waste
- **Liquid Waste:** Human Liquid waste

3. Energy Consumed & CO₂ Emission:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	296	0.27
2	Maximum	34	0.03
3	Minimum	3	0.00
4	Average	24.67	0.02

4. Various Measures Adopted for Environmental Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

5. Usage of Renewable Energy:

- The College has yet to install Solar PV Plant.

6. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	121	68	81
2	Minimum	106	62	79

7. Waste Management:

7.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are kept at various points.

7.2 Liquid Waste Management:

The College has installed a Septic Tank and is cleaned periodically.



8. Rain Water Management:

The rain water falling on the terrace is collected in a Storage Tank and used for domestic purpose, after filtration.

9. Eco Friendly Practices:

- Internal Tree Plantation
- Creation of Awareness about 3 R's Reduce, Recycle & Reuse by Display of Posters

10. Assumption:

- 1 kWh (Unit) of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

11. References:

1. For CO₂ calculations: www.tatapower.com
2. For AQI Standards: www.cpcb.com



ABBREVIATIONS

AQI	:	Air Quality Index
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO ₂	:	Carbon Di Oxide
CPCB	:	Central Pollution Control Board
NSS	:	National Service Scheme
PM	:	Particulate Matter



CHAPTER-I INTRODUCTION

1.1 Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment"

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules



2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency)
10.	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Objectives:

1. To study Recourse Consumption and CO₂ Emission
2. To Study CO₂ Emission Reduction
3. To Study Indoor Air Quality
4. To Study Waste Management & Rain Water Management
5. To study Environment Friendly Practices

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name	Loknete Balasaheb Thorat Arts, Commerce & Science College,
2	Address	Talegaon Dighe, Taluka: Sangamner, District: Ahmednagar
3	Affiliation	Savitribai Phule Pune University



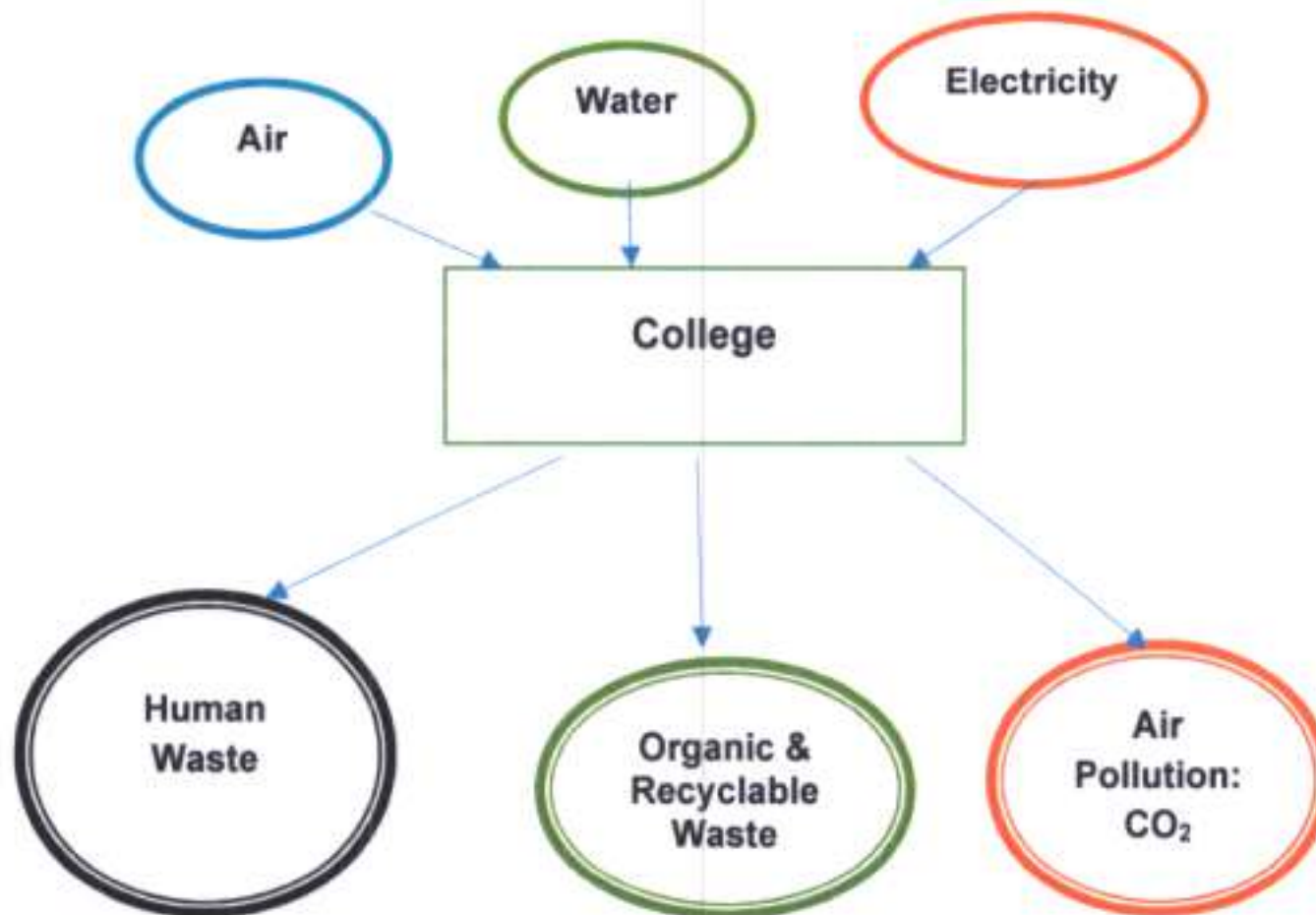
CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

Chart No: 1: Representation of College as System:



We compute the Generation of CO₂ on account of consumption of Electrical Energy as under. The basis of Calculation for CO₂ emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere.

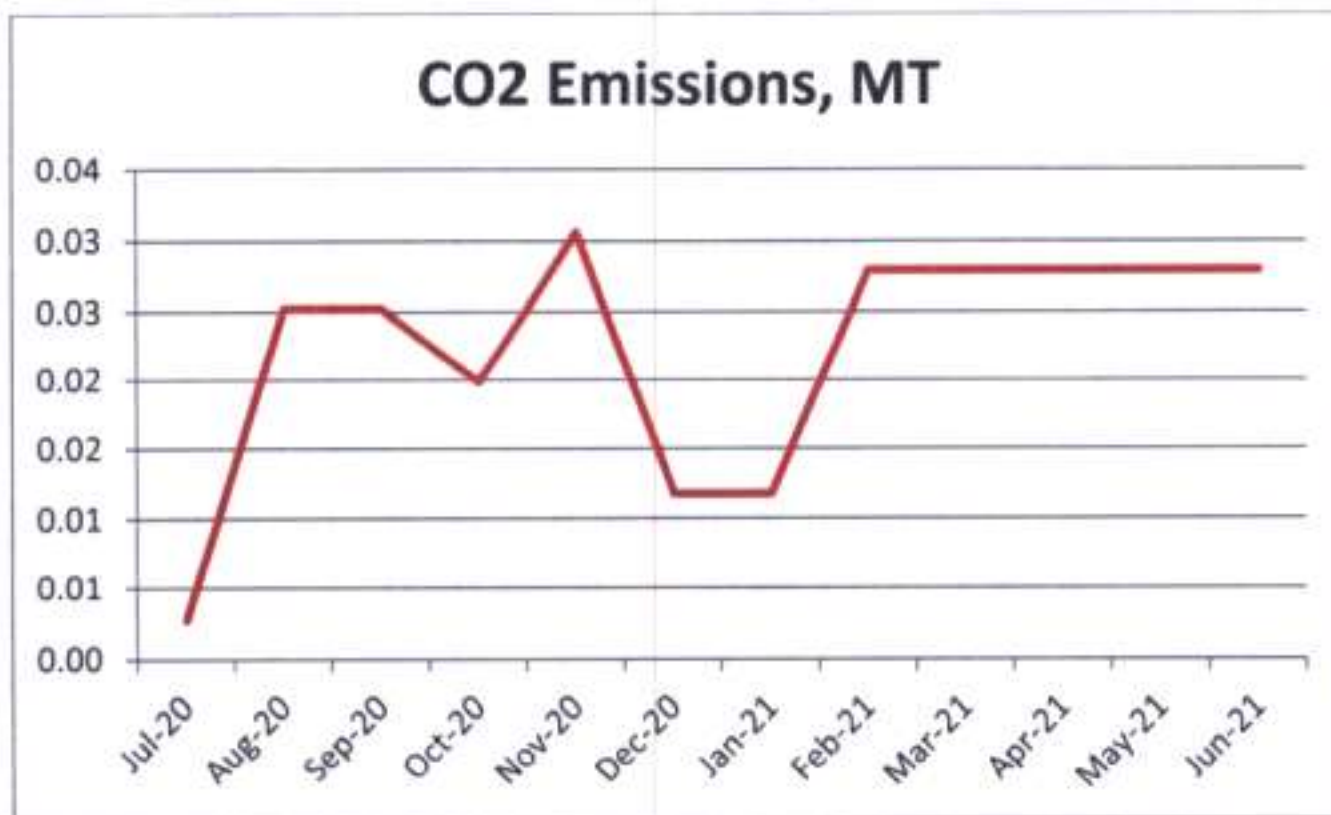
Table No 5: Electrical Energy Usage & CO₂ Emission: 2020-21:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jul-20	3	0.00
2	Aug-20	28	0.03
3	Sep-20	28	0.03
4	Oct-20	22	0.02
5	Nov-20	34	0.03
6	Dec-20	13	0.01



7	Jan-21	13	0.01
8	Feb-21	31	0.03
9	Mar-21	31	0.03
10	Apr-21	31	0.03
11	May-21	31	0.03
12	Jun-21	31	0.03
13	Total	296	0.27
14	Maximum	34	0.03
15	Minimum	3	0.00
16	Average	24.67	0.02

Chart No 2: To study CO₂ Emission:



CHAPTER-III

STUDY OF USAGE OF RENEWABLE ENERGY

- The College has yet to install Solar PV Plant.



CHAPTER-IV STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 'air pollution' has been defined as 'the presence in the atmosphere of any air pollutant.'

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 'air pollutant' has been defined as 'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM 2.5- Particulate Matter of Size 2.5 micron
3. PM 10- Particulate Matter of Size 10 micron

Table No 6: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Seminar hall	113	61	81
2	IQAC Room	120	66	81
3	T Y B Com Classroom	110	63	80
4	F Y B Sc Classroom	106	62	79
5	IQAC Room	114	64	79
6	T Y B A Classroom	121	68	81
	Maximum	121	68	81
	Minimum	106	62	79

CHAPTER-V

STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are located at various locations

Photograph of Separate Waste Collection Bin:



5.2 Liquid Waste Management:

The College has a Septic Tank, and is cleaned periodically.



CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The Rain water falling on the terrace is collected through Pipes and is collected in the Main Water Storage Tank. This Water is further used for domestic purpose after filtration

Photograph of Rain Water Carrying Pipe:



CHAPTER VII

STUDY OF ENVIRONMENT FRIENDLY PRACTICES

7.1 Internal Tree Plantation:

The College has well maintained Tree plantation.

Photograph of Tree Plantation:



7.2 Creation of Awareness about 3 R's Reduce, Recycle & Reuse:

The College has displayed posters emphasizing on importance of 3 R's Reduce, Recycle & Reuse

Photograph of Poster on 3 R's Reduce, Recycle & Reuse:



ANNEXURE-I: INDOOR AIR QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

