

ENVIRONMETAL AUDIT REPORT

Of

Shri Wagheshwar Gramvikas Pratishthan's,
LOKNETE SHRI DADA PATIL PHARATE
COLLEGE OF PHARMACY,
Mandavgan Pharata, Taluka: Shirur, District: Pune



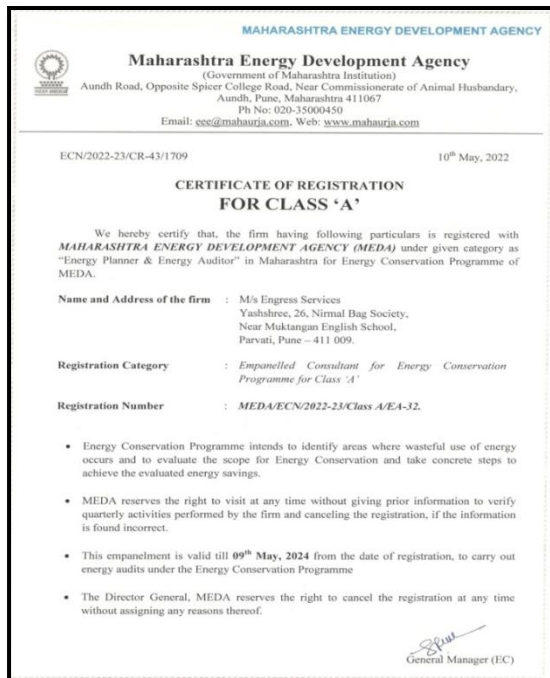
Year: 2022-23

Prepared by

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
Near Mukhtangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com

REGISTRATION CERTIFICATES



MEDA REGISTRATION CERTIFICATE



ISO: 9001-2015 CERTIFICATE

ASSOCHAM GEM CP CERTIFICATE



ISO: 14001-2015 CERTIFICATE

INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	4
II	Executive Summary	5
III	Abbreviations	7
1	Introduction	8
2	Study of Resource Consumption & CO ₂ Emission	10
3	Study of Usage of Renewable Energy	12
4	Study of Indoor Air Quality	13
5	Study of Indoor Comfort Condition Parameters	14
6	Study of Waste Management	15
7	Study of Rain water Harvesting	17
8	Study of Eco Friendly Initiatives	18
	Annexure	
I	Indoor Air Quality, Noise, & Indoor Comfort Standards	19

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shri Wagheshwar Gramvikas Pratishthan's Loknete Shri Dada Patil Pharate College Of Pharmacy, Mandavgan Pharate, Taluka: Shirur, District: Pune, for awarding us the assignment of Environmental Audit of their Mandavgan campus for the Year: 2022-23.

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

EXECUTIVE SUMMARY

1. Shri Wagheshwar Gramvikas Pratishthan's Loknete Shri Dada Patil Pharate College Of Pharmacy, Mandavgan Pharate, Taluka: Shirur, District: Pune consumes Energy in the form of **Electrical Energy**; used for various gadgets, Office & other facilities.

2. Pollution due to College Activities:

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumed	20675	kWh
2	Annual CO ₂ Emissions	18.61	MT

4. Usage of Renewable Energy:

- Installation of Solar Thermal Water Heating System at Hostel.
- The College has yet to install Roof Top Solar PV Plant

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	40	24	31
2	Minimum	36	22	24

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	28.6	52.1	165	45
2	Minimum	27	51.8	119	39

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Sanitary Waste	Installed Sanitary Waste Incinerator
3	Chemical Fumes	Provision of a Fumigation Chamber
4	Liquid Waste	Provision of Septic Tank

8. Rain Water Management:

The College has installed Pipes from the terrace and the Rain water falling on the terrace is used to increase the Underground Water Table.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Swachh Bharat by Display of Posters

10. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

11. References:

- For CO₂ Emissions: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Quality Standards: www.cpcb.com

ABBREVIATIONS

SWGP	: Shri Wagheshwar Gramvikas Pratishthan
AQI	: Air Quality Index
LED	: Light Emitting Diode
kWh	: kilo-Watt Hour
MT	: Metric Ton
CO ₂	: Carbon Di Oxide
ISHRAE	: The Indian Society of Heating, Refrigerating & Air conditioning Engineers
CPCB	: Central Pollution Control Board
LPD	: Liters Per Day
NSS	: National Service Scheme
PM	: Particulate Matter

CHAPTER-I INTRODUCTION

1. Important Definitions:

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

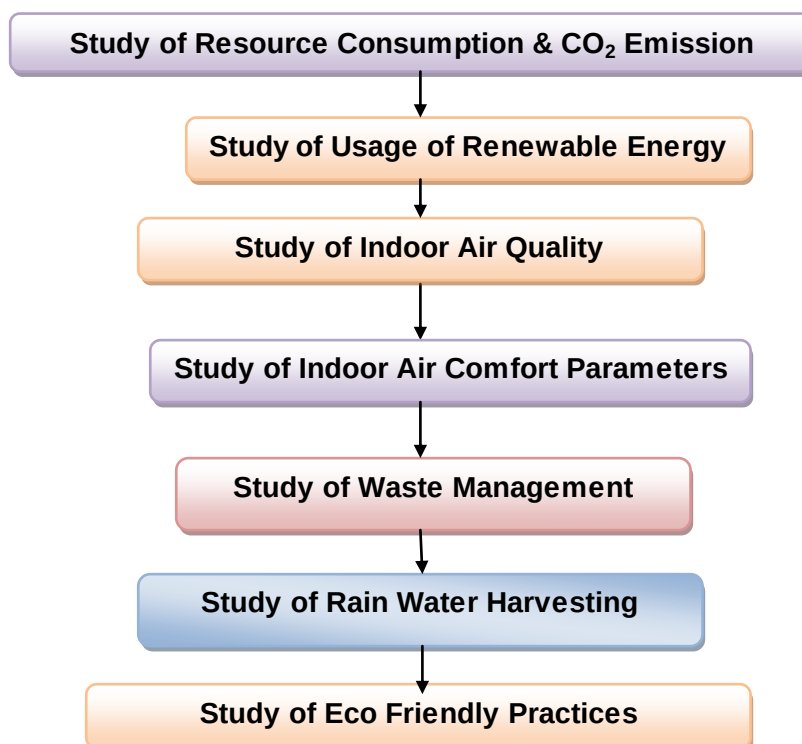
1.2. Environmental Audit: Definition:

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

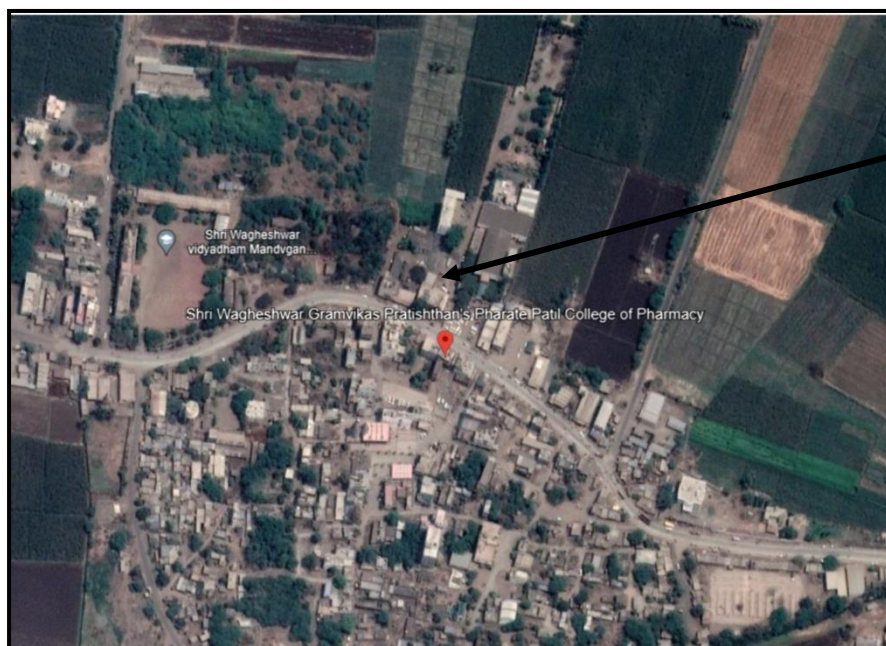
According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment"

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

1.4 Audit Procedural Steps:



1.5 Google Earth Image:



College
Campus

CHAPTER-II

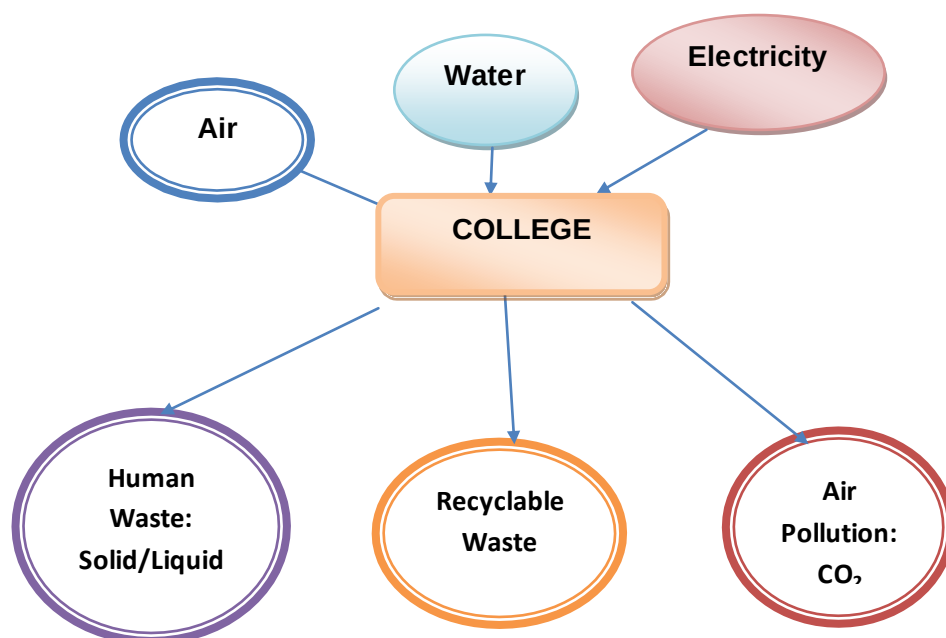
STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The College consumes following basic/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 & Study of Resources & Waste



Now we compute the Generation of CO₂ on account of consumption of Electrical Energy. The basis of Calculation for CO₂ emissions due to Electrical Energy is as under.

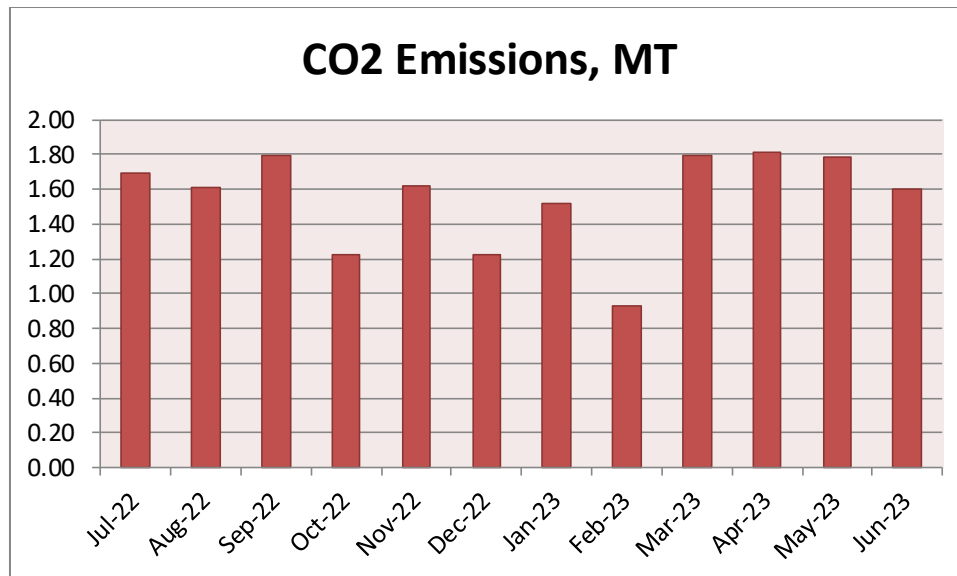
- **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

Table No 1: Study of Purchase of Energy & CO₂ Emissions: 22-23:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jul-22	1880	1.69
2	Aug-22	1785	1.61
3	Sep-22	1990	1.79
4	Oct-22	1365	1.23
5	Nov-22	1798	1.62

6	Dec-22	1365	1.23
7	Jan-23	1689	1.52
8	Feb-23	1036	0.93
9	Mar-23	1997	1.80
10	Apr-23	2015	1.81
11	May-23	1980	1.78
12	Jun-23	1775	1.60
13	Total	20675	18.61
14	Maximum	2015	1.81
15	Minimum	1036	0.93
16	Average	1722.92	1.55

Chart No 2: Month wise CO₂ Emissions:



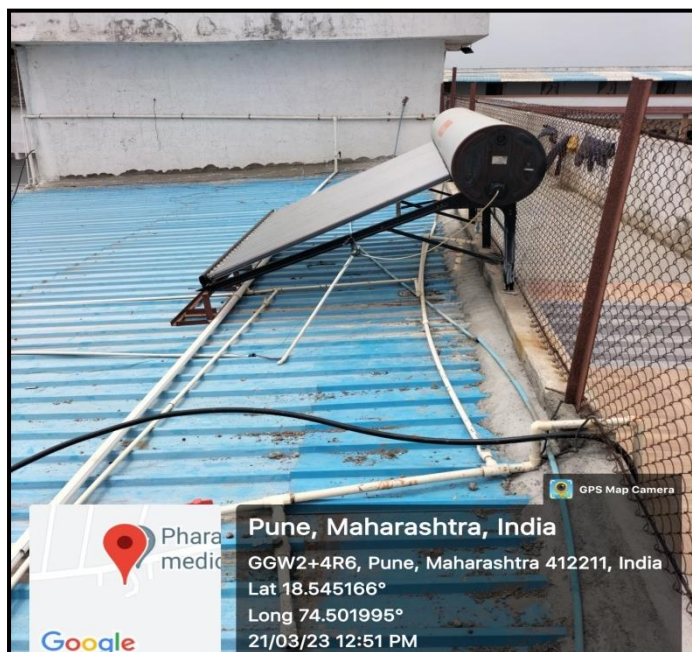
CHAPTER-III

STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Solar Thermal Water Heating System at the Hostel Block

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

Photograph of Roof Top Solar Thermal Water Heating System:



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 litres** 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 liveability.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

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.**'

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 2: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Principal Cabin	36	22	26
2	First Floor	40	24	29
3	Pharmacology Lab	36	22	24
4	Pharmaceutics Lab	40	24	31
5	Chem Lab	36	22	25
	Maximum	40	24	31
	Minimum	36	22	24

CHAPTER-V

STUDY OF INDOOR AIR CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 5: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Principal Cabin	27	52	127	39
2	First Floor	27.3	52.1	129	41
3	Pharmacology Lab	27.5	51.9	135	43
4	Pharmaceutics Lab	28	51.8	165	41
5	Chem Lab	28.6	51.9	119	45
	Maximum	28.6	52.1	165	45
	Minimum	27	51.8	119	39

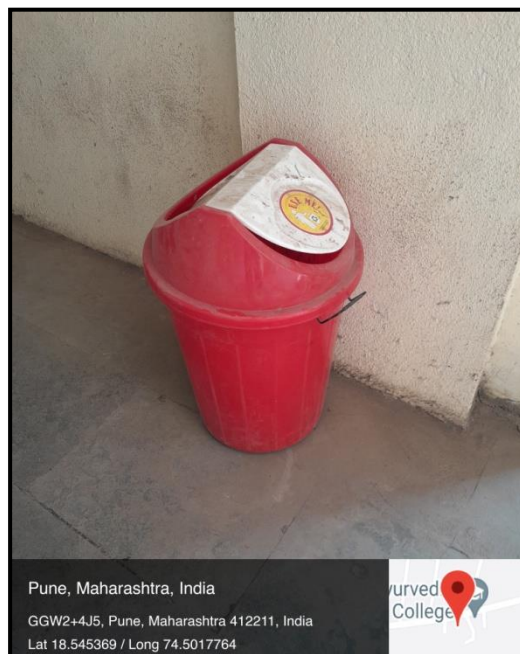
CHAPTER-VI

STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

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

Photograph of Separate Waste Collection Bin:



6.2 Sanitary Waste Management:

The College has installed Sanitary Waste Incinerator, for disposal of Sanitary Waste.

Photograph of Sanitary Waste Incinerator:



6.3 Chemicals' Storage & Fumes' Management:

Hazardous chemicals are kept away from the reach of students in the fumigation Chamber.

Photograph of Fumigation Chamber:



6.4 Liquid Waste Management:

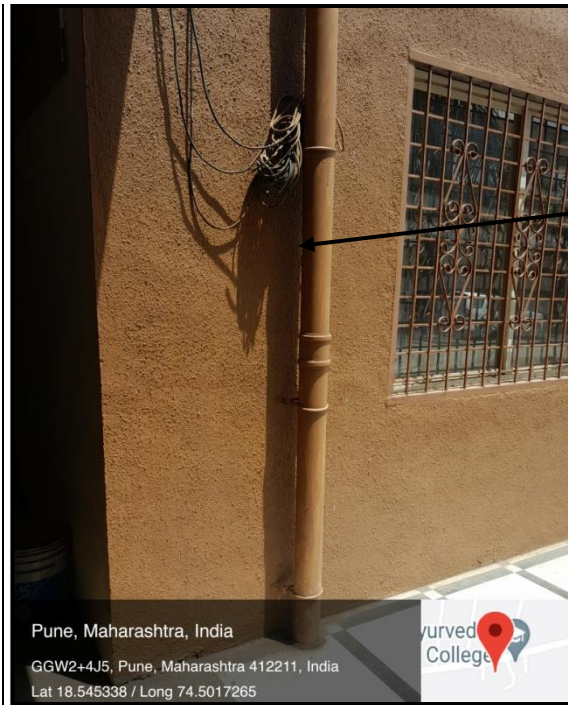
The College has a Septic Tank, for disposal of Liquid Waste and is cleaned periodically.

CHAPTER-VII

STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Carrying Pipe:



Rain Water
Carrying Pipe

CHAPTER VIII

STUDY OF ECO FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The College has well maintained Tree plantation.

Photograph of Tree Plantation:



8.2 Creation of Awareness on Swatch Bharat by Display of Posters:

The College has displayed posters on Swatch Bharat.

Photograph of Poster Display Board on Swatch Bharat:



ANNEXURE-I: VARIOUS AIR QUALITY, NOISE & COMFORT 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 +

2. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

3. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33 ⁰ C
2	Humidity	Less Than 70%