7.1: Institutional Values and Social Responsibilities

7.1.3: Quality audits on environment and energy regularly undertaken by the Institution.

Supporting documents as per SoP:

C. Green audit/environmental audit report

MHALSAKANT MOHANRAO SARDESHMUKH

Digitally signed by MHALSAKANT MOHANRAO SARDESHMUKH
DN: cn=MHALSAKANT MOHANRAO SARDESHMUKH, c=IN, st=MAHARASHTRA, o=Jayawant Shikshan Prasarak Mandal, ou=private, serialNumber=bb90192922d0b1b15bf350e83cadc947e2afdb655d886a9f3f21d9461161b63b
Date: 2024.05.14 17:06:57 +05'30'

Director

ENVIRONMENTAL AUDIT REPORT

Of

Jayawant Shikshan Prasarak Mandal's,

NARHE TECHNICAL CAMPUS, NARHE

Year: 2022-23

Prepared by:

ENGRESS SERVICES

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

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/JSPMNTC/22-23/02 **Date: 14/5/2023**

This is to certify that we have conducted Environmental Audit at Jayawant Shikshan Prasarak Mandal's Narhe Technical Campus, Narhe, Pune, in the Academic year 2022-23.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Light Fitting
- Usage of BEE STAR Rated Energy Efficient Equipment
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp.
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness about Energy Conservation by Display of Posters

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,

A Y Mehendale,
B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

REGISTRATION CERTIFICATES

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

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

ECN/2022-23/CR-43/1709 — 10th May, 2022

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 Engress Services, Yashshree, 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune – 411 009.

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Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

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- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

MEDA REGISTRATION CERTIFICATE

GEM Certificate

ASSOCHAM
Ideate · Innovate · Impact

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

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on
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He/she is now eligible to execute the GEM Sustainability Certification Projects.
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Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

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Quality Management System of

ENGRESS SERVICES

26, YASHASHREE, BLOCK 1, LOKMANYA NAGAR, NIRMAL BAUG SOC, PARVATI, PUNE- 411009, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope :

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT.

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mms EGAC Accredited QMS Certification CAB # 118005 — IAF

Director

Magnitude Management Services Pvt. Ltd.
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P, India

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EXECUTIVE SUMMARY

1. Jayawant Shikshan Prasarak Mandal's Narhe Technical Campus, Narhe, Pune consumes Energy in the form of **Electrical Energy;** used for various gadgets, office & other facilities

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**130220**	kWh
2	Annual CO_2 Emissions	**117.20**	MT

4. Renewable Energy & Reduction in CO_2 Emissions:

- The Institute has installed Roof Top Solar PV Plant of Capacity **10 kWp.**
- The Energy generated by Solar PV Plant in 22-23 is **12000 kWh**.
- Reduction in CO_2 Emissions in 22-23 is **10.8 MT**

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**64**	**37**	**46**
2	Minimum	**55**	**34**	**38**

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	**27.2**	**71**	**136**	**45**
2	Minimum	**26.9**	**69**	**105**	**41**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Liquid Waste	Installed Sewage Treatment Plant
3	E Waste	Recommended dispose of through Authorized Agency

8. Rain Water Management

The College has installed the Rainwater Management project; the rain water falling on the terrace is collected in a Water Storage Tank and then used further for domestic purpose, after treatment.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Energy Conservation Display of Posters

10. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere
2. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
3. Annual Solar Energy generation Days: **300 Nos**

11. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Quality Standards: www.cpcb.com

ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

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 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

1.3. 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:

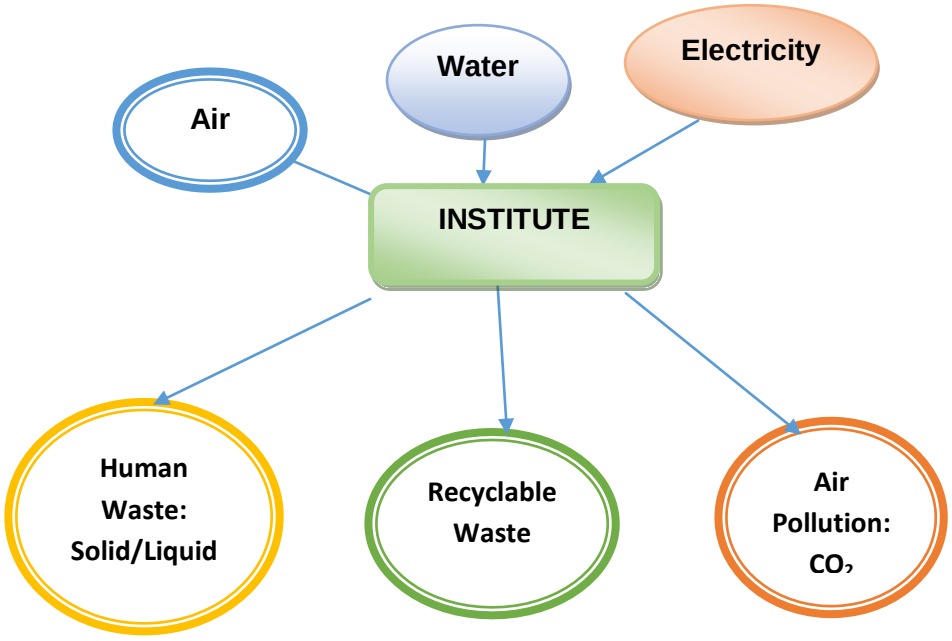
1.5 Google Earth Image:

CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.
Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

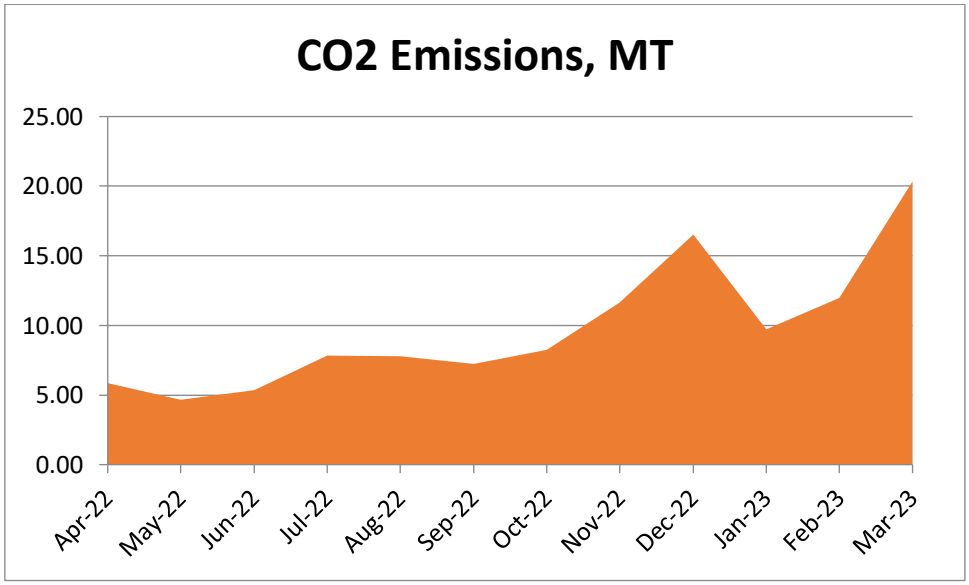
- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 1: Study of Purchase of Energy & CO_2 Emissions: 22-23:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-22	6493	5.84
2	May-22	5180	4.66
3	Jun-22	5948	5.35
4	Jul-22	8678	7.81
5	Aug-22	8641	7.78

6	Sep-22	8060	7.25
7	Oct-22	9146	8.23
8	Nov-22	12963	11.67
9	Dec-22	18382	16.54
10	Jan-23	10812	9.73
11	Feb-23	13317	11.99
12	Mar-23	22601	20.34
13	Total	130220	117.20
14	Maximum	22601	20.34
15	Minimum	5180	4.66
16	Average	10852	9.77

Chart No 2: Month wise CO_2 Emissions:



CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **10 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof TOP Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	10	kWp
2	Energy Generated in per kWp	4	kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 22-23	12000	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**10.8**	MT of CO_2

Photograph of Roof Top 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.

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. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects.

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 4: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Office	61	37	44
2	Staffroom	60	36	38
3	Lab	64	37	46
4	Classroom	60	34	39
5	HOD Cabin	55	34	38
	Maximum	**64**	**37**	**46**
	Minimum	**55**	**34**	**38**

CHAPTER V
STUDY OF INDOOR COMFORT 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, ^{0}C	Humidity, %	Lux Level	Noise Level, dB
1	Office	27.1	70	114	45
2	Staffroom	26.9	69	105	42
3	Lab	27.1	69	112	43.6
4	Classroom	27.1	71	126	44
5	HOD Cabin	27.2	70	136	41
	Maximum	**27.2**	**71**	**136**	**45**
	Minimum	**26.9**	**69**	**105**	**41**

CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste Bins are kept at various locations.

Photograph of Waste Collection Bin:

6.2 Liquid Waste Management:

The College has installed a Sewage Treatment Plant for treatment of the sewage. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

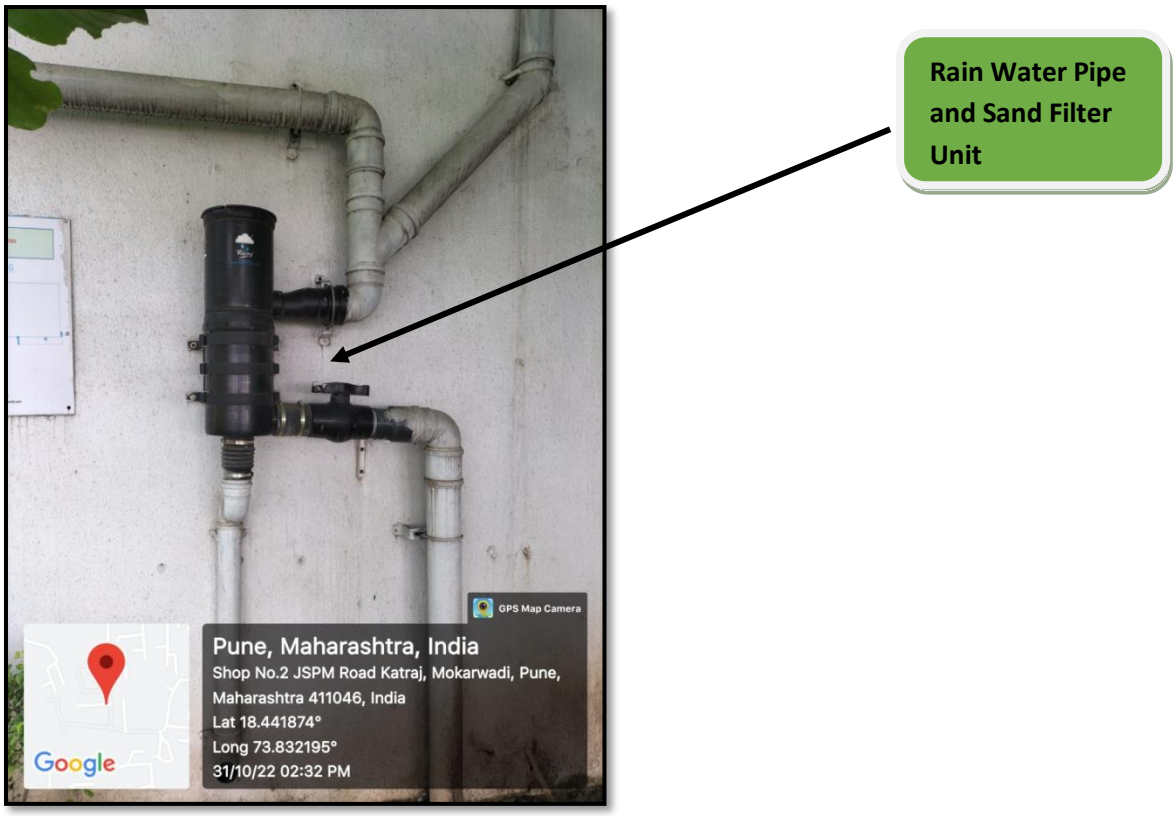
6.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rainwater Management project; the rain water falling on the terrace is collected in a Water Storage Tank and then used further for domestic purpose, after treatment.

Photograph of Rain water Carrying Pipe:

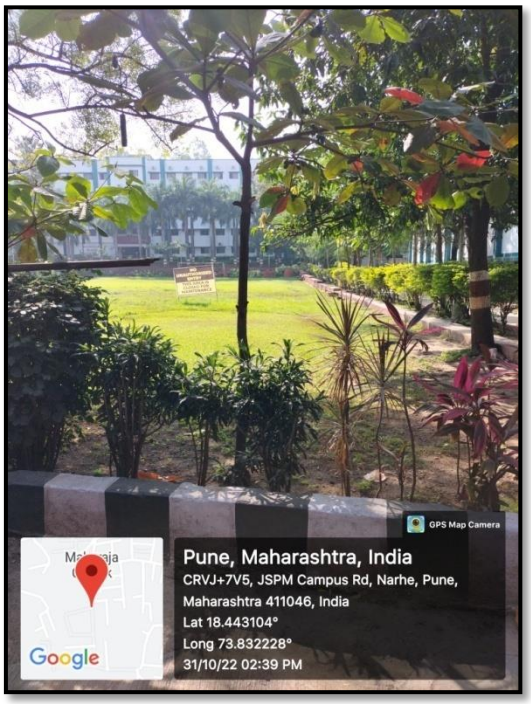


CHAPTER-VIII
STUDY OF ECO FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:



8.2 Creation of Awareness about Energy Conservation:

The College has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:

ANNEXURE-I:
AIR QUALITY, NOISE & INDOOR 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 33^0C
2	Humidity	Less Than 70%

GREEN AUDIT REPORT

Of

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NARHE TECHNICAL CAMPUS, NARHE

Year: 2022-23

Prepared by:

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ABBREVIATIONS

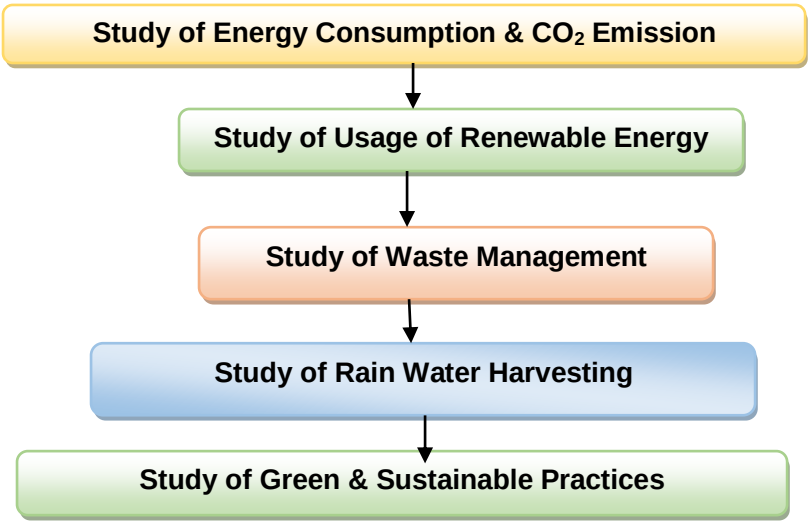
JSPM	Jayawant Shikshan Prasarak Mandal
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

CHAPTER-I
INTRODUCTION

1.1 Introduction:

A Green Audit is conducted at Jayawant Shikshan Prasarak Mandal's Narhe Technical Campus, Narhe, Pune

1.2 Audit Procedural Steps:



1.3 Institute Location Image:

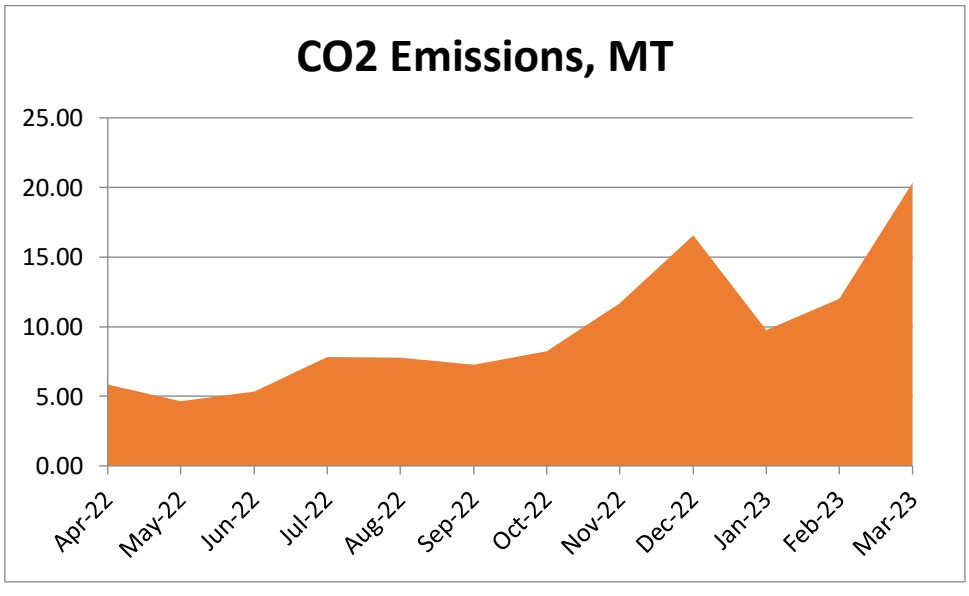
CHAPTER-II
STUDY OF ENERGY CONSUMPTION & CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions: 1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere.

Table No 1: Month wise Energy Consumption & CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-22	6493	5.84
2	May-22	5180	4.66
3	Jun-22	5948	5.35
4	Jul-22	8678	7.81
5	Aug-22	8641	7.78
6	Sep-22	8060	7.25
7	Oct-22	9146	8.23
8	Nov-22	12963	11.67
9	Dec-22	18382	16.54
10	Jan-23	10812	9.73
11	Feb-23	13317	11.99
12	Mar-23	22601	20.34
13	Total	130220	117.20
14	Maximum	22601	20.34
15	Minimum	5180	4.66
16	Average	10852	9.77

Chart No 1: Month wise CO_2Emissions:



CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **10 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 2: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	10	kWp
2	Energy Generated in per kWp	4	kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 22-23	12000	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**10.8**	MT of CO_2

Photograph of Roof Top Solar PV Plant:

CHAPTER IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste Bins are kept at various locations.

Photograph of Waste Collection Bin:

4.2 Liquid Waste Management:

The College has installed a Sewage Treatment Plant for treatment of the sewage. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

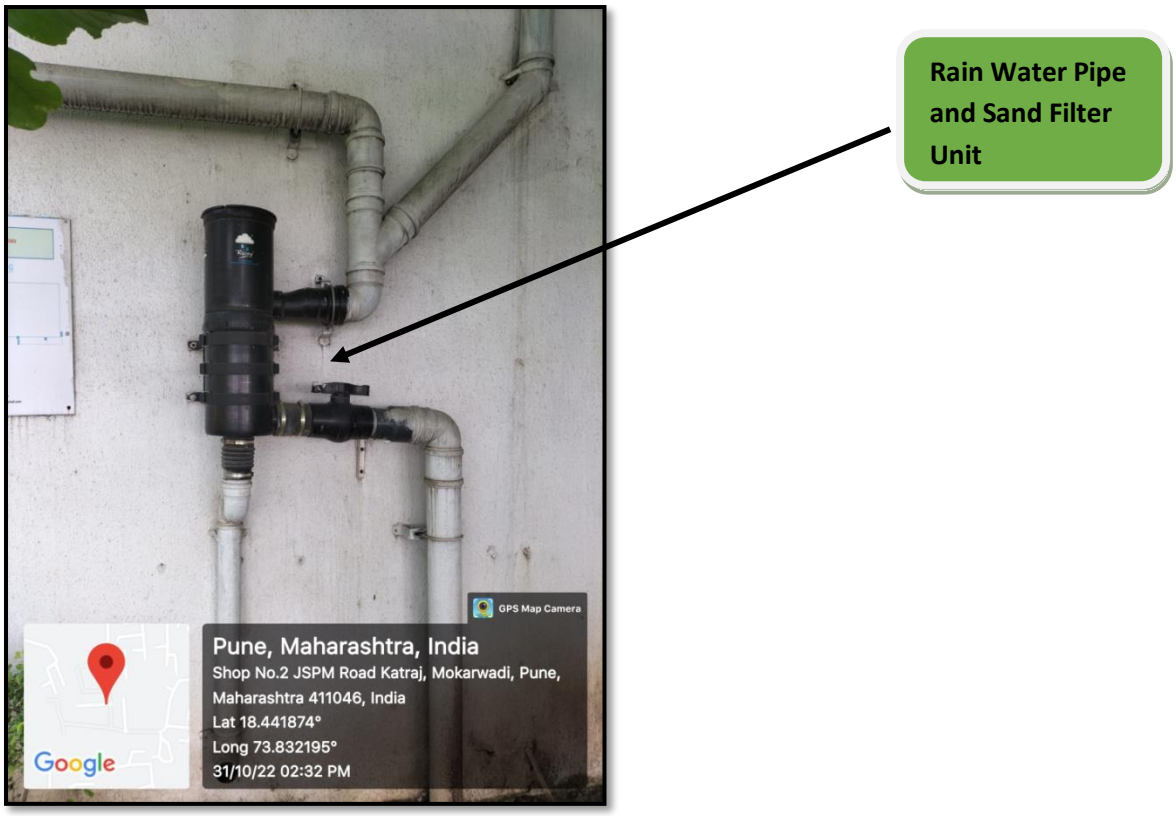
4.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rainwater Management project; the rain water falling on the terrace is collected in a Water Storage Tank and then used further for domestic purpose, after treatment.

Photograph of Rain water Carrying Pipe:



CHAPTER-VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

6.1 Pedestrian Friendly Road:
The College has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

6.2 Internal Tree Plantation:
The College has well maintained landscaped garden in the campus.

Photograph of Lawn and Tree plantation:

6.3 Provision of Ramp:

For easy movement of Divyangajan, the College has made provision of Ramp.

Photograph of Ramp:

6.4 Creation of Awareness about Energy Conservation:

The College has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:

ANNEXURE-1:
LIST OF TREES:

No	Common Name	Number
1	Poptree	75
2	Jackfruit	1
3	Guava	2
4	Almond	18
5	Umbar	2
6	Ashoka	11
7	Shevari	11
8	Mango	2
9	Kadunimb	8
10	Coconut	8
11	Vad	3
12	Peepal	3
13	Krishnazad	3
14	Chikoo	1
15	Khair	1
16	Shenga	6
17	Kaghalshevari	1
18	Nirgundi	4
19	Sitafal	1
20	Papaya	1
21	**Total**	**162**