



TATKARE CHARITABLE TRUST, KOLAD

DR. SHREE. NANASAHEB DHARMADHIKARI

Kolad - Gove, Tal - Roha, Dist - Raigad, Pin - 402304,

Register No E-536 (Raigad) Date - 19/8/2006.

Email ID - dr.snd.acsc.kolad288@gmail.com / Principal Mob. No. 8983512652

CHAIRMAN : AVADHUT ANIL TATKARE SECRETARY : SANDEEP ANIL TATKARE PRINCIPAL: Dr. MUNDE SHANKAR S.

Supporting Document

**7.1.3 Quality Audits On Environment and Energy Audit Regularly undertaken by the Institution.
(Policy Audit Report From Recognized Bodies)**

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PRINCIPAL
T.C.T.S.

Arts, Com & Science College
Kolad, Tal -Roha, Dist.-Raigad

ENVIRONMENTAL AUDIT REPORT

of

Tatkare Charitable Trust's,

DR. SHREE NANASAHEB DHARMADHIKARI

ARTS, COMMERCE & SCIENCE COLLEGE,

Gove Kolad, Tal: Roha, District: Raigad

Year: 2019-20

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,

Near Mukangan English School, Parvati, Pune 411009

Phone: 09890444795 Email: enrichcons@gmail.com



MAHARASHTRA ENERGY DEVELOPMENT AGENCY



Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)
2nd Floor, MILADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006,
Ph No: 020-26614393/266144403
Email: eee@mahaarja.com, Web: www.mahaarja.com

ECN/2018-19/CR-05/4174

19th September, 2018

**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 : **Enrich Consultants**
Yashashree, Plot No. 26, Nirmal Bag Society,
Near Muktaangan English School,
Parvati, Pune - 411009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme*

Registration Number : *MEDA/ECN/CR-05/2018-19/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 the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** 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.


(Smita Kudarikar)
General Manager (EC)



Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Mukangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/DSNDC/19-20/03

Date: 4/7/2020

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad in the year 2019-20.

The College has adopted following Environment Friendly Practices:

- Maximum Usage of Day Lighting
- Usage of LED Lighting at some locations
- Segregation of Waste at source
- Installation of Rain Water Management Project
- Tree Plantation in the Campus
- Creation of Awareness on 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 Enrich Consultants,



A Y Mehendale,
Certified Energy Auditor,
EA-8192



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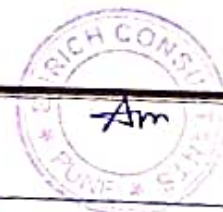
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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad, for awarding us the assignment of Environmental Audit of their Gove Kolad Campus for the Year: 19-20

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



EXECUTIVE SUMMARY

1. Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad consumes Energy in the form of Electrical Energy; used for various equipment.

2. Pollution caused due to College 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. Present Energy Consumption & CO₂ Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	5819	5.24
2	Maximum	679	0.61
3	Minimum	398	0.358
4	Average	484.92	0.44

4. Usage of Renewable Energy:

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

5. Waste Management:

5.1 Segregation of Waste at source:

The Waste is segregated at the source: Waste bins are kept at various locations.

5.2 Organic Waste Management:

It is recommended to convert organic waste into Bio compost, in a Bio Composting Bed.

6. Rain Water Management:

The Rain water is collected is collected through Pipes and is used to increase the underground water table

7. Eco Friendly Initiatives:

- Internal Tree Plantation
- Creation of Awareness on Energy Conservation by Display of Posters

8. Assumption:

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

8. Reference:

- For CO₂ Emission 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 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. Table No 1: Relevant Environmental Laws in India:

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

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

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 Institute)
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 Consumption of Resources and CO₂ Emission
2. To Study Usage of Renewable Energy
3. To Study Waste Management Practices
4. To Study Rain Water Management
5. To study Eco Friendly Initiatives

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name of Institution	Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College
2	Address	Gove Kolad, Tal: Roha, District: Raigad
3	Establishment	2009



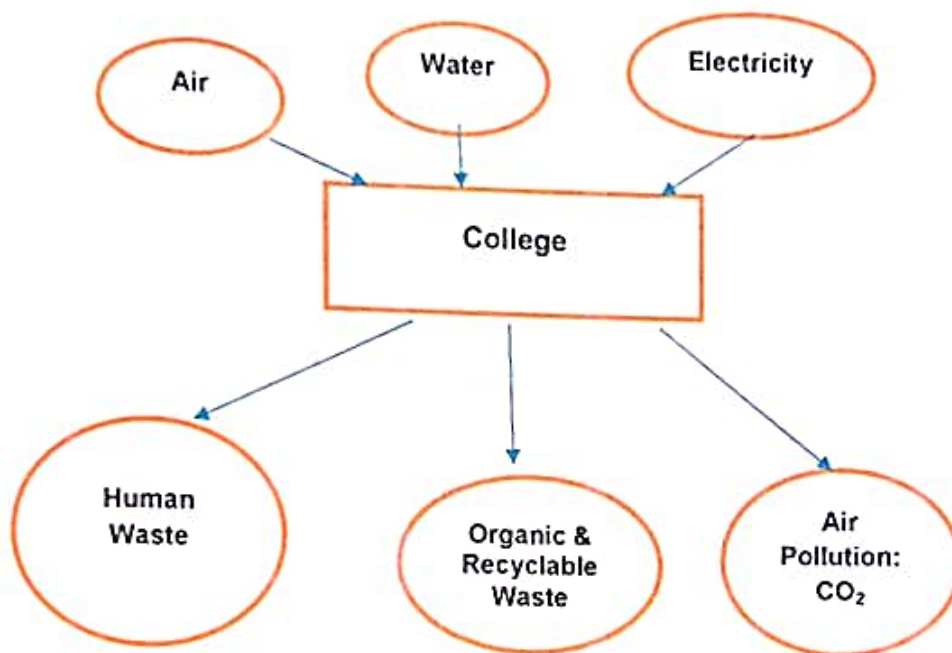
CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

2.1 The Institute consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

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

2.2 Chart No: 1: Representation of College as System:



We compute the Generation of CO₂ on account of consumption of Electrical Energy as under.

Table No 5: To study Energy Consumption and CO₂ Emission: 19-20:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-19	457	0.41
2	May-19	498	0.45
3	Jun-19	478	0.43
4	Jul-19	501	0.45
5	Aug-19	679	0.61
6	Sep-19	465	0.42
7	Oct-19	505	0.45

8	Nov-19	425	0.38
9	Dec-19	398	0.36
10	Jan-20	415	0.37
11	Feb-20	509	0.46
12	Mar-20	489	0.44
13	Total	5819	5.24
14	Maximum	679	0.61
15	Minimum	398	0.358
16	Average	484.92	0.44

Chart No 2: To study the variation in CO₂ Emissions, MT:

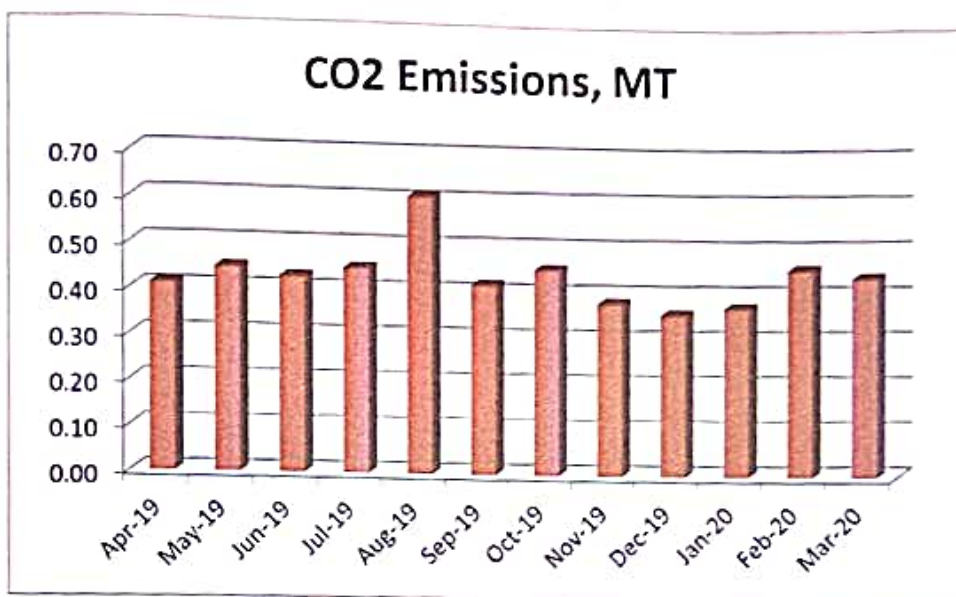


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy consumed, kWh	CO ₂ Emissions, MT
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CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

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



CHAPTER IV STUDY OF WASTE MANAGEMENT

4.1 Solid Waste Management:

The Waste is segregated at the source: Waste bins are kept at various locations.

Photograph of Waste Collection Bin:



4.2 Organic Waste Management:

It is recommended to convert organic waste into Bio compost, in a Bio Composting Bed.

CHAPTER V STUDY OF RAIN WATER MANAGEMENT

The Rain water from the terrace is collected is collected through Pipes and is used to increase the underground water table

Photograph of Rain Water Carrying Pipe from Terrace:



CHAPTER VI

STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

6.1 Tree Plantation:

The College has maintained plantation in the campus.

Photograph of Garden in the College campus:



6.2 Creation of Awareness on Energy Conservation:

The College has displayed poster on Energy Conservation, to create the awareness on Saving the Energy.

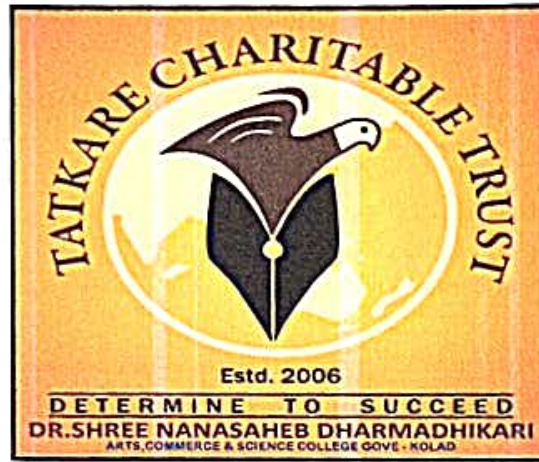
Photograph of Poster on Energy Conservation:



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Year: 2020-21

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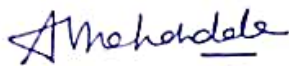
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- Creation of awareness on Water Conservation by Display of Posters

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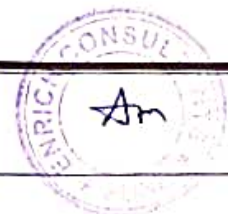
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- Liquid Waste: Human Liquid waste

3. Present Energy Consumption & CO₂ Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	4910	4.42
2	Maximum	1404	1.26
3	Minimum	0	0
4	Average	409.17	0.37

4. Usage of Renewable Energy:

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

5. Indoor Air Quality:

No	Parameter/Range	AQI	PM-2.5	PM-10
1	Maximum	93	55	69
2	Minimum	73	46	58

5. Waste Management:

5.1 Solid Waste Management:

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

5.2 Organic Waste Management:

The College has installed a Vermi Composting Unit, for conversion of Organic Waste.

6. Rain Water Management:

The Rain water is collected is collected through Pipe and is used to increase the underground water table

7. Eco Friendly Initiatives:

- Tree plantation in the campus
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1. 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

8. References:

- For CO₂ Emission Calculations: www.tatapower.com
- For Indoor Air Quality Parameters: www.cpcb.com



ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO ₂	:	Carbon Di Oxide
AQI	:	Air Quality Index
CPCB	:	Central Pollution Control Board



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1.1 Important Definitions:

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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

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1.2 Objectives:

1. To study Consumption of Resources and CO₂ Emission
2. To Study Usage of Renewable Energy
3. To study Indoor Air Quality
4. To Study Waste Management Practices
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3	Establishment	2009

CHAPTER-II

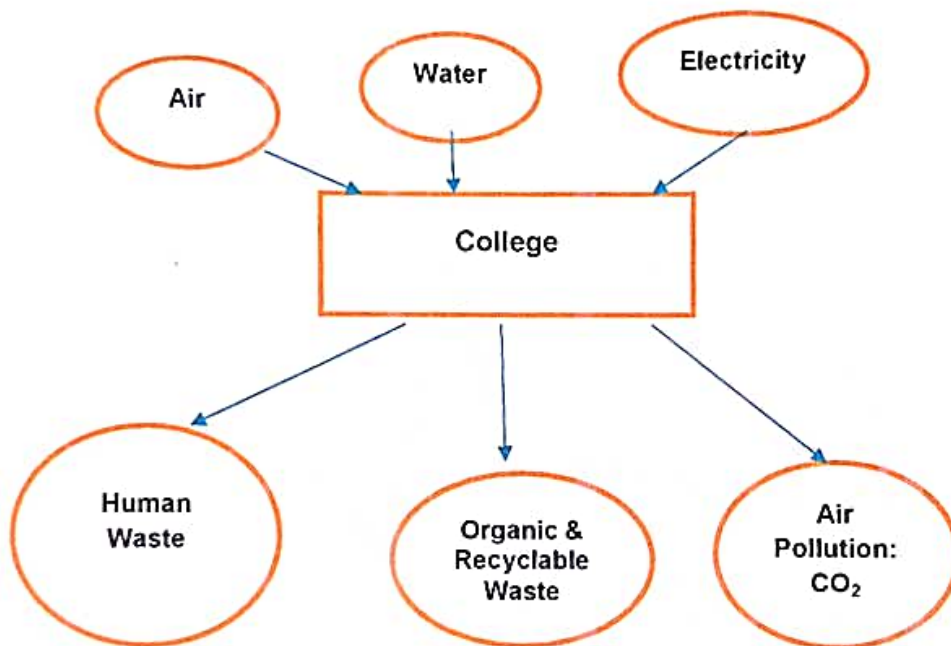
STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

2.1 The Institute consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

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

2.2 Chart No: 1: Representation of College as System:



We compute the Generation of CO₂ on account of consumption of Electrical Energy as under.

Table No 5: To study Energy Consumption and CO₂ Emission: 20-21:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-20	409	0.37
2	May-20	403	0.36
3	Jun-20	403	0.36
4	Jul-20	0	0.00
5	Aug-20	1404	1.26
6	Sep-20	301	0.27

7	Oct-20	415	0.37
8	Nov-20	385	0.35
9	Dec-20	281	0.25
10	Jan-21	311	0.28
11	Feb-21	304	0.27
12	Mar-21	294	0.26
13	Total	4910	4.42
14	Maximum	1404	1.26
15	Minimum	0	0
16	Average	409.17	0.37

Chart No 2: To study the variation in CO₂ Emissions, MT:

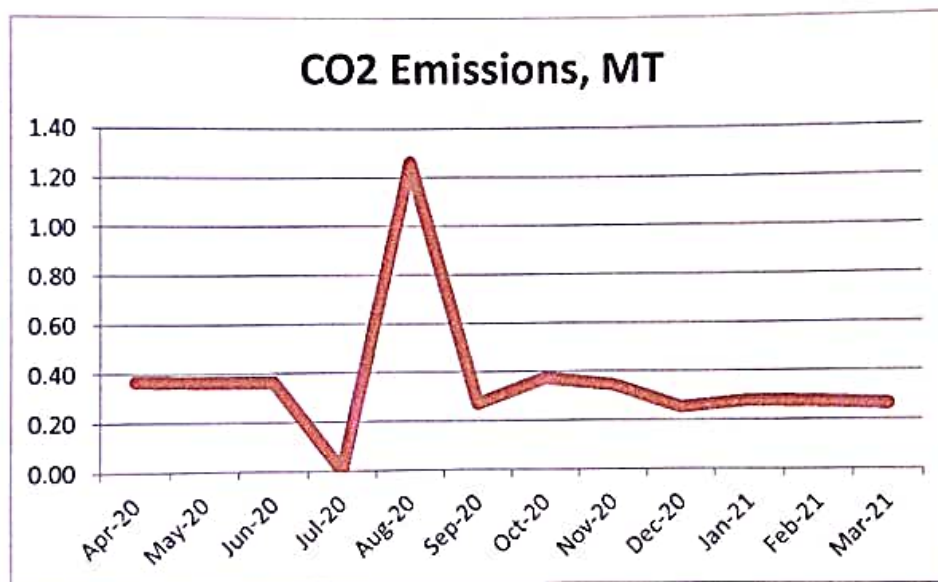


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy consumed, kWh	CO ₂ Emissions, MT
1	Total	4910	4.42
2	Maximum	1404	1.26
3	Minimum	0	0
4	Average	409.17	0.37

CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

The College has yet to install Solar PV Plant



CHAPTER IV STUDY OF INDOOR AIR QUALITY

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

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
3. PM 2.5- Particulate Matter of Size 2.5

Table No 7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	M-10
1	Admin Office	93	55	68
2	Staff Room	90	54	69
3	Botany Lab	85	51	62
4	Chemistry Lab	73	46	58
5	YCMOU Room	75	47	58
	Maximum	93	55	69
	Minimum	73	46	58

CHAPTER V STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

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

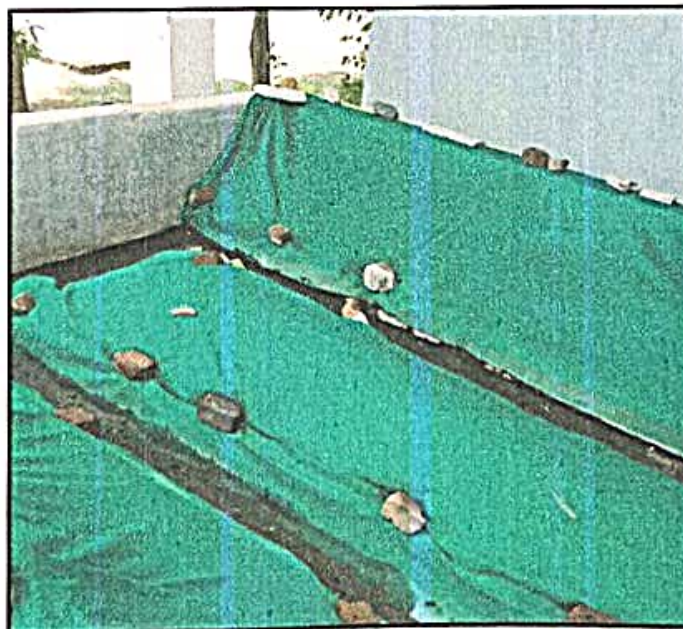
Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

The College has a Vermi Composting Unit, to convert the Organic Waste into Compost.

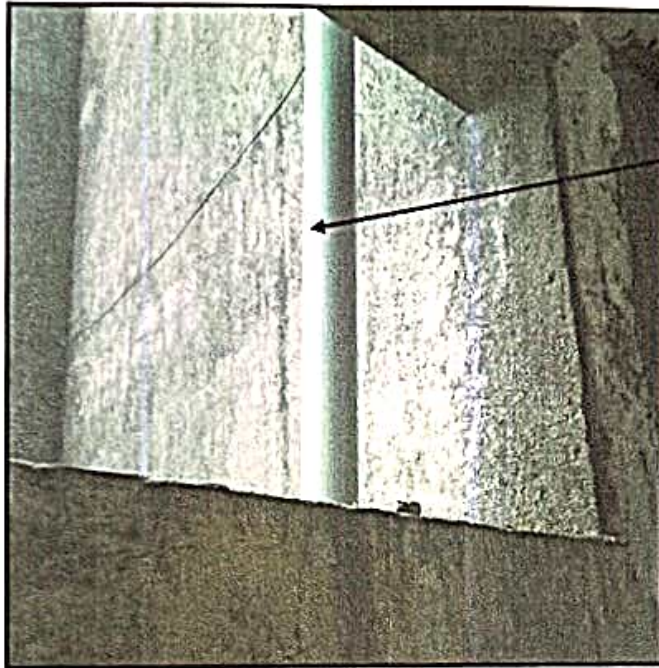
Photograph of Vermi Composting Unit:



CHAPTER VI STUDY OF RAIN WATER MANAGEMENT

The Rain water from the terrace is collected is collected through Pipe and is used to increase the underground water table.

Photograph of Rain Water Management Pipe from Terrace:



Rain Water
Pipe

CHAPTER VII

STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

7.1 Tree Plantation:

The College has well maintained Tree plantation in the campus.

Photograph of Tree Plantation In the Colloge campus:



7.2 Creation of Awareness on Water Conservation:

The College has displayed poster on Water Conservation at Water Cooler, to create the awareness on Saving the Water.

Photograph of Poster on Water Conservation:



ANNEXURE-I: VARIOUS AIR QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM-2.5 & PM-10:

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 +

ENVIRONMENTAL AUDIT REPORT

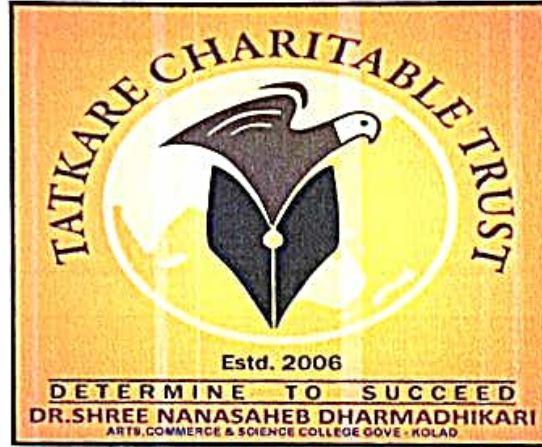
of

Tatkare Charitable Trust's,

DR. SHREE NANASAHEB DHARMADHIKARI

ARTS, COMMERCE & SCIENCE COLLEGE,

Gove Kolad, Tal: Roha, District: Raigad



Year: 2021-22

Prepared by

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktang English School, Parvati, Pune 411009

Phone: 09890444795 Email: engress123@gmail.com



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 411007
Ph No: 020 23004450
E-mail: evag.maharaja.com Web: www.maharaja.com

FCN/2022-23/CR-43/1709 10th May, 2022

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

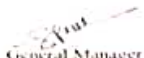
We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm M's Engress Services
Nashibore, 26, Narmal Bag Society,
Near Muktaang English School,
Parvati, Pune - 411009

Registration Category *Employed Consultant for Energy Conservation Programme for Class 'A'*

Registration Number **MEDA/FCN/2022-23/Class A/E1-12.**

- 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 **09th May, 2024** 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 (FC)

 **GEM Certificate** 

ASSOCHAM hereby certifies that
Mr. A Y Mehendale

has successfully passed the
Green and Eco-friendly Movement Certified Professional Test (GEM CP)
with
"Excellent Performance"
on
06 June, 2022

He/she is now eligible to execute the GEM Sustainability Certification Projects.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

 **Pankaj R. Dharkar**
Chairman GEM

GEM CP 22/785

 **Deepak Sood**
Secretary General ASSOCHAM

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Mukhtangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: EC/DSNDC/21-22/03

Date: 26/6/2022

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad in the year 2021-22.

The College has adopted following Environment Friendly Practices:

- Maximum Usage of Day Lighting
- Usage of LED Lighting
- Segregation of Waste at source
- Vermi Composting Arrangement for Organic Waste Conversion
- Installation of Rain Water Management Project
- Tree Plantation in the Campus
- Creation of Awareness on Plastic Free Campus 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,
Certified Energy Auditor,
EA-8192



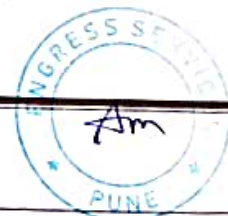
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I	Indoor Air Quality, Noise & Comfort Parameter Standards	21

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad, for awarding us the assignment of Environmental Audit of their Gove Kolad Campus for the Year: 21-22

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



EXECUTIVE SUMMARY

1. Tatkare Charitable Trust's Dr. Shree Nanasahab Dharmadhikari Arts, Commerce & Science College, Gove Kolad, Tal: Roha, District: Raigad consumes Energy in the form of Electrical Energy; used for various equipment.

2. Pollution caused due to College 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. Present Energy Consumption & CO₂ Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	3820	3.44
2	Maximum	487	0.44
3	Minimum	85	0.077
4	Average	318.33	0.29

4. Usage of Renewable Energy:

- The College has yet to install Solar PV Plant.

5. Indoor Air Quality Parameters:

No	Parameter/Range	AQI	PM-2.5	PM-10
1	Maximum	37	25	29
2	Minimum	33	20	22

6. Indoor Comfort Condition Parameters:

No	Parameter/ Range	Temperature, °C	Humidity, %	Lux Level	Noise Level Range, dB
1	Maximum	26.5	87	135	46
2	Minimum	25.3	86.2	99	39

7. Waste Management:

7.1 Solid Waste Management:

The Waste is segregated at the source. Waste bins are kept at various locations.

7.2 Organic Waste Management:

The College has installed a Vermi Composting Unit, for conversion of Organic Waste.

8. Rain Water Management:

The Rain water is collected is collected through Pipe and is used to increase the underground water table

9. Eco Friendly Initiatives:

- Internal tree plantation in the campus
- Creation of Awareness on Plastic Free Campus by Display of Posters

8. Assumption:

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

8. Reference:

- For CO₂ Emission 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 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. Table No 1: Relevant Environmental Laws in India:

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

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

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 Consumption of Resources and CO₂ Emission
2. To Study Usage of Renewable Energy
3. To study Indoor Air Quality
4. To study Indoor Comfort Condition Parameters
5. To Study Waste Management Practices
6. To Study Rain Water Management
7. To study Eco Friendly Initiatives

1.3 Google Earth Image:



College
Campus



1.4 Table No 4: General Details of College:

No	Head	Particulars
1	Name of Institution	Tatkare Charitable Trust's Dr. Shree Nanasaheb Dharmadhikari Arts, Commerce & Science College
2	Address	Gove Kolad, Tal: Roha, District: Raigad
3	Establishment	2009



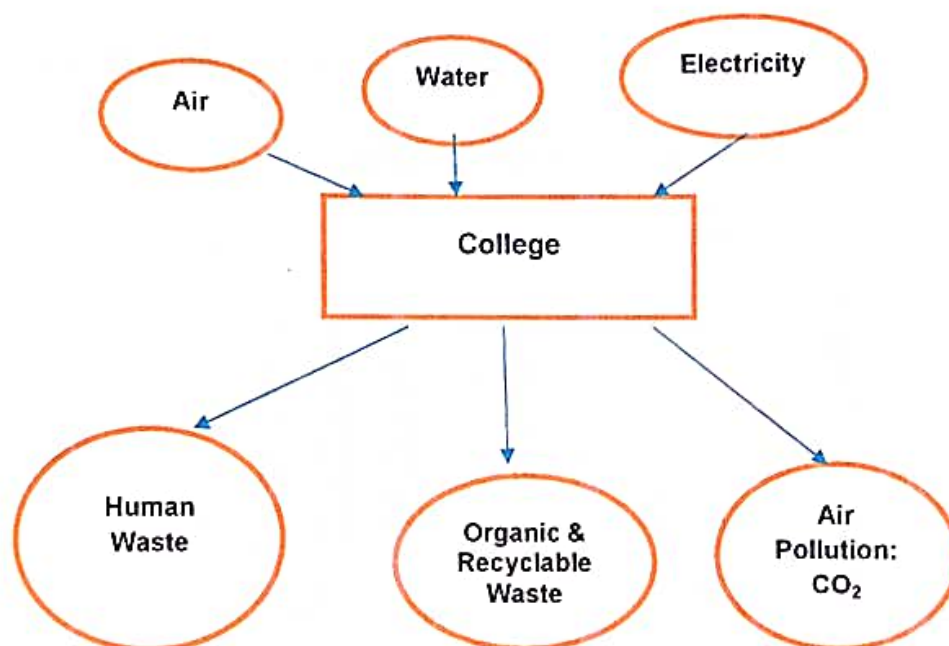
CHAPTER-II STUDY OF RESOURCES CONSUMPTION & CO₂ EMISSION

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.

Table No 5: To study Energy Consumption and CO₂ Emission: 21-22:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-21	487	0.44
2	May-21	359	0.32
3	Jun-21	309	0.28
4	Jul-21	310	0.28
5	Aug-21	85	0.08
6	Sep-21	373	0.34

7	Oct-21	293	0.26
8	Nov-21	381	0.34
9	Dec-21	256	0.23
10	Jan-22	267	0.24
11	Feb-22	331	0.30
12	Mar-22	369	0.33
13	Total	3820	3.44
14	Maximum	487	0.44
15	Minimum	85	0.077
16	Average	318.33	0.29

Chart No 2: To study the variation in CO₂ Emissions, MT:

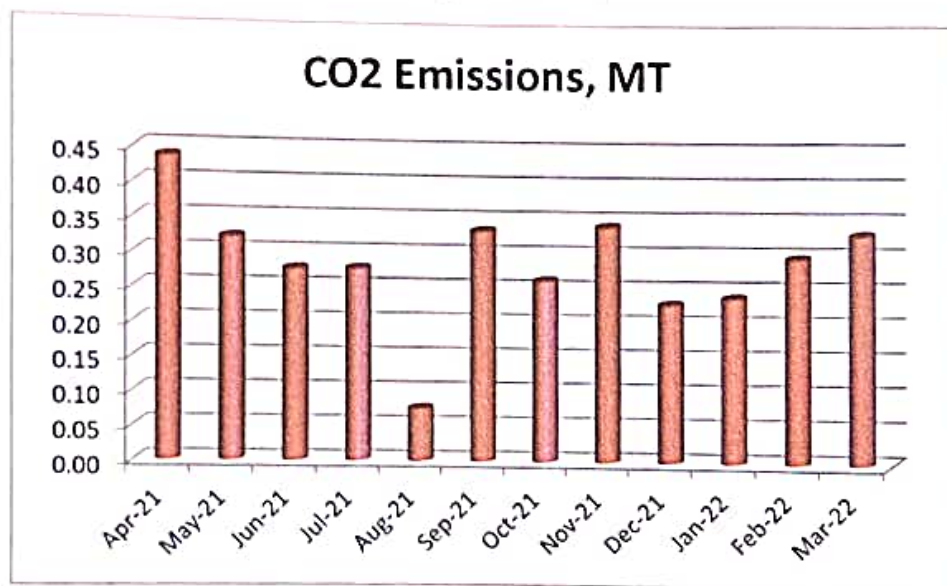


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy consumed, kWh	CO ₂ Emissions, MT
1	Total	3820	3.44
2	Maximum	487	0.44
3	Minimum	85	0.077
4	Average	318.33	0.29

CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

The College has yet to install 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.

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.'

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. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the AQI requires an air monitor and an air pollutant concentration over a specified averaging period.

We present herewith following important Parameters.

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

Table No 7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	M-10
1	Principal Sir Cabin	37	24	29
2	Staff Room	33	20	28

3	Admin Office	35	21	22
4	F Y B Sc Class Room	36	22	24
5	S Y B Sc Class Room	37	25	29
6	S Y B A Class Room	36	22	26
	Maximum	37	25	29
	Minimum	33	20	22



CHAPTER V

STUDY OF INDOOR COMFORT CONDITION

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 8: Study of Indoor Comfort Parameters:

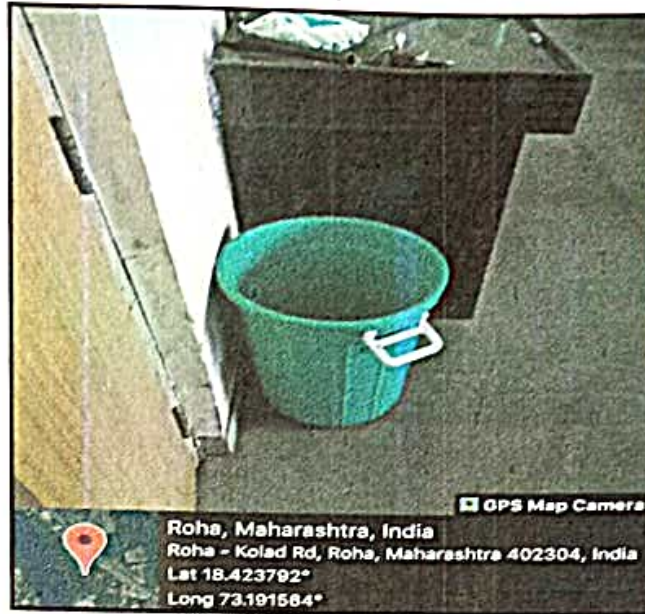
No	Location	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Principal Sir Cabin	25.3	87	135	39
2	Staff Room	25.5	86.5	129	40
3	Admin Office	26	86.6	112	42
4	F Y B Sc Class Room	26.1	86.7	109	45
5	S Y B Sc Class Room	26.2	86.5	124	46
6	S Y B A Class Room	26.5	86.2	99	41
	Maximum	26.5	87	135	46
	Minimum	25.3	86.2	99	39

CHAPTER VI STUDY OF WASTE MANAGEMENT

6.1 Solid Waste Management:

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

Photograph of Waste Collection Bin:



6.2 Organic Waste Management:

The College has a Vermi Composting Unit, to convert the Organic Waste into Compost.

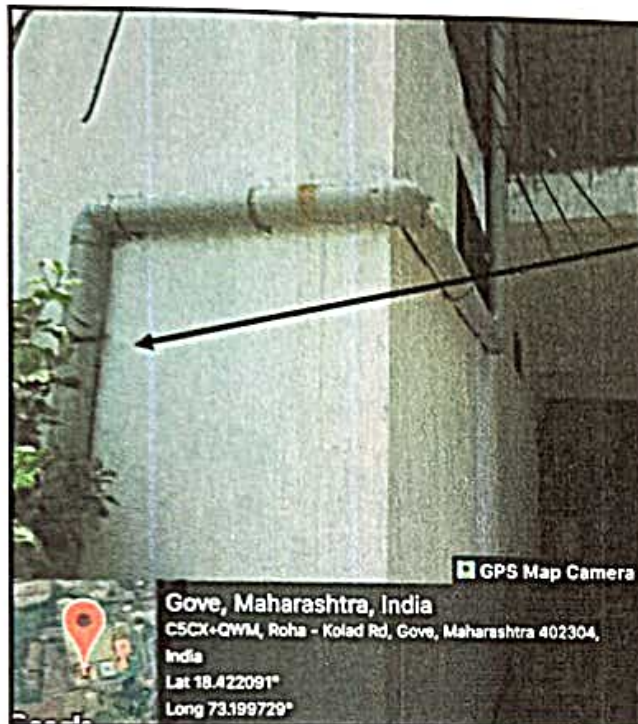
Photograph of Vermi Composting Unit:



CHAPTER VII STUDY OF RAIN WATER MANAGEMENT

The Rain water from the terrace is collected is collected through Pipe and is used to increase the underground water table.

Photograph of Rain Water Management Pipe from Terrace:



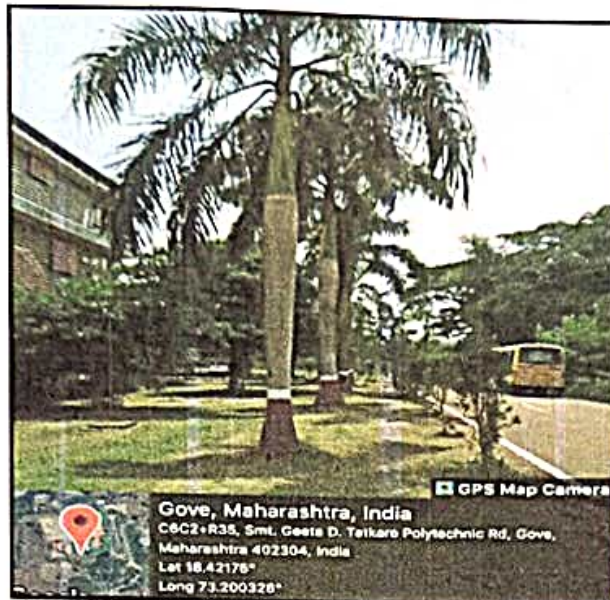
Rain Water
Collecting Pipe

CHAPTER VIII STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

8.1 Tree Plantation:

The College has maintained plantation in the campus.

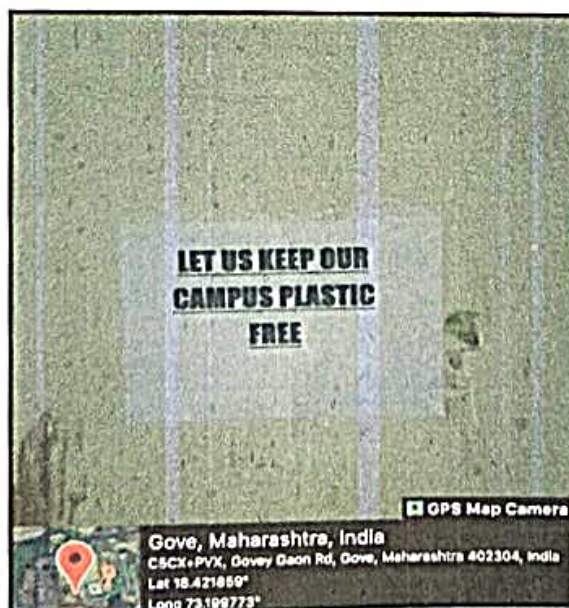
Photograph of Garden in the College campus:



8.2 Creation of Awareness on Plastic Free Campus:

In order to create awareness on Plastic Free Campus, the College has displayed Poster on the same.

Photograph of Poster on Plastic Free Campus:



ANNEXURE-I: VARIOUS AIR QUALITY, WATER QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM-2.5 & PM-10:

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°C
2	Humidity	Less Than 70%