

# ENVIRONMENTAL AUDIT REPORT

of

## RAHUL COLLEGE OF EDUCATION

Navghar Raod, Bhayander (East), Thane 401 105

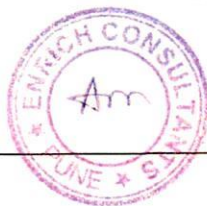


Year: 2020-21

Prepared by:

### ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,  
Near Muktagan English School, Parvati, Pune 411009  
Phone: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)



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Mira Road (East), Thane - 401107.

### 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 : 10<sup>th</sup> August 2007

### BEE AUDITOR CERTIFICATE

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**  
An ISO 9001:2000 Reg. No. ISO 91-2482

**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@mahauria.com, Web: www.mahauria.com

ECN/2021-22/CR-14/1577 22<sup>nd</sup> 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  
Yashashree, 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-63

- 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 21<sup>st</sup> 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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Enrich Consultants, Pune

  
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## ENRICH CONSULTANTS

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Near Mukhtangan English School, Parvati, Pune 411 009  
Tel: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)

Ref: EC/RCOE/20-21/03

Date: 12/7/2021

### CERTIFICATE

This is to certify that we have conducted Environmental Audit at Rahul College of Education, Bhayander (East) Thane 401 105, in the Academic year 2020-21.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Segregation of Waste at source
- Implementation of Rain Water Management Project
- Creation of Awareness on Ban on Single Use Plastic 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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## **ACKNOWLEDGEMENT**

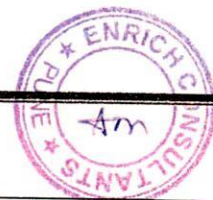
We Enrich Consultants, Pune, express our sincere gratitude to the management of Rahul College of Education, Bhayander (East) Thane 401 105, for awarding us the assignment of Environmental Audit of their Campus for the Year: 2020-21.

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

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## EXECUTIVE SUMMARY

1. Rahul College of Education, Bhayander, consumes Energy in the form of Electrical Energy; used for various Electrical Equipment..

### 2. Pollution caused due to College Activities:

- **Air pollution:** Mainly CO<sub>2</sub> 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 & CO<sub>2</sub> Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Total	15338	13.80
2	Maximum	2778	2.50
3	Minimum	878	0.79
4	Average	1278.17	1.15

### 4. Usage of Renewable Energy:

- 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	123	71	82
2	Minimum	110	60	76

### 6. Waste Management:

#### 6.1 Segregation of Waste at Source:

The Dry and Wet waste is segregated at the source. Waste collection Bins are kept at various points.

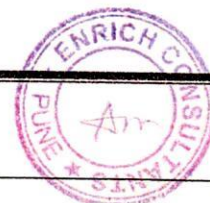
### 7. Rain Water Management:

The Rain water falling on terrace is used to increase the Underground Water Table.

### 8. Eco Friendly Initiatives:

- Creation of awareness on Ban on Single Use Plastic by Display of Posters

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**9. Assumption:**

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO<sub>2</sub>** into atmosphere

**10. References:**

1. For AQI Standards: [www.cpcb.com](http://www.cpcb.com)
2. For CO<sub>2</sub> calculations: [www.tatapower.com](http://www.tatapower.com)

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## ABBREVIATIONS

Kg	:	Kilo Gram
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

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## 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 Resource Consumption & CO<sub>2</sub> Emissions
2. To Study Usage of Renewable Energy
3. To study Indoor Air Quality Parameters
4. To Study of Waste Management
5. To Study of Rain Water Management
6. To Study of Eco Friendly Initiatives

**1.4 Table No 4: General Details of College:**

No	Head	Particulars
1	Name of College	Rahul College of Education
2	Address	Navghar Road, Bhayander (East) Thane 401 105
3	Affiliation	University of Mumbai

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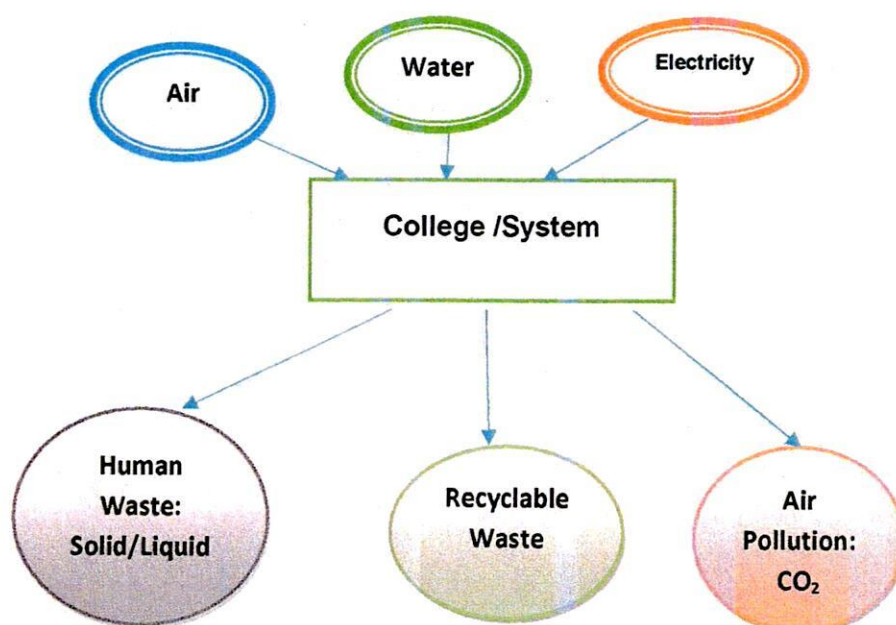
## CHAPTER-II STUDY OF CONSUMPTION OF RECOURCES & CO<sub>2</sub> EMISSION

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 in System & Environment Pattern:



Now we compute the Generation of CO<sub>2</sub> on account of consumption of Electrical Energy. The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy are as under

- 1 Unit (kWh) of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

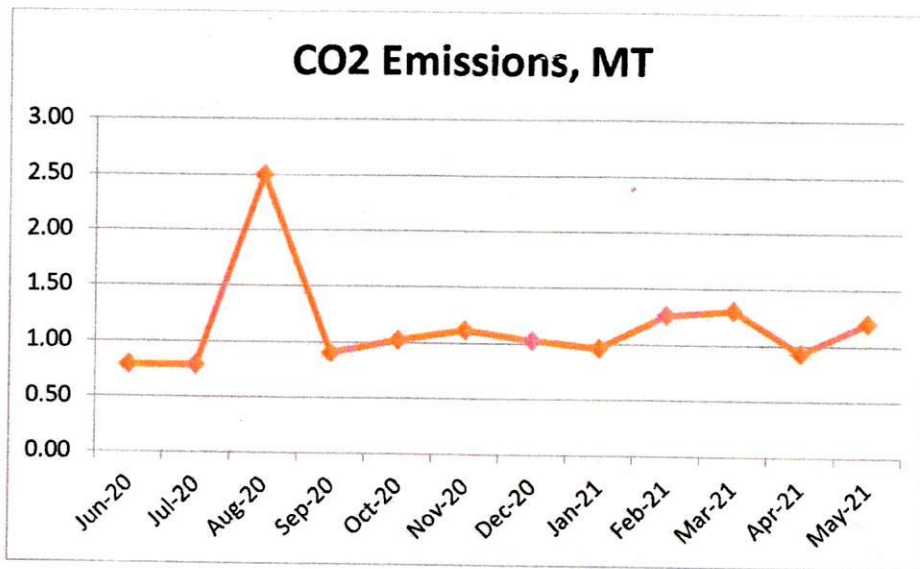
Table No 5: Study of Consumption of Electrical Energy & CO<sub>2</sub> Emissions: 20-21:

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jun-20	878	0.79
2	Jul-20	878	0.79
3	Aug-20	2778	2.50
4	Sep-20	1005	0.90
5	Oct-20	1136	1.02
6	Nov-20	1237	1.11
7	Dec-20	1139	1.03
8	Jan-21	1069	0.96

Environmental Audit Report: Rahul College of Education, Bhayander (East): 2020-21

9	Feb-21	1398	1.26
10	Mar-21	1448	1.30
11	Apr-21	1036	0.93
12	May-21	1336	1.20
13	Total	15338	13.80
14	Maximum	2778	2.50
15	Minimum	878	0.79
16	Average	1278.17	1.15

Chart No 2: Month wise CO<sub>2</sub> Emissions:



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**CHAPTER III**  
**STUDY OF USAGE OF RENEWABLE ENERGY**

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

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## 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.

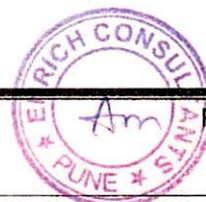
We present herewith following important Parameters.

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	110	60	76
2	Language Room	115	63	78
3	Staff Room	123	71	82
4	Classroom	116	64	78
5	Library	120	68	80
	Maximum	123	71	82
	Minimum	110	60	76

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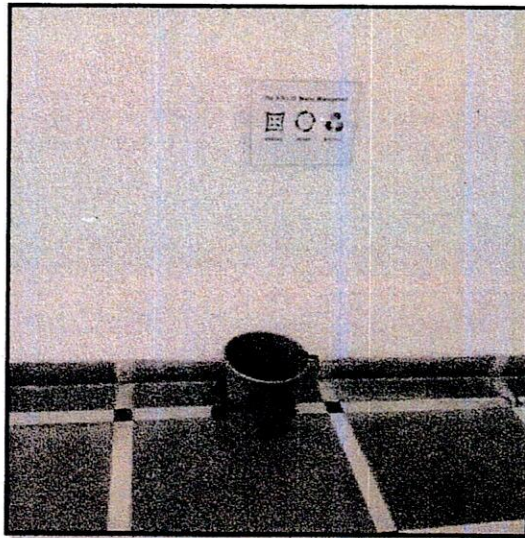
## **CHAPTER V**

### **STUDY OF WASTE MANAGEMENT**

#### **5.1 Segregation of Waste at Source:**

The Dry and Wet waste is segregated at the source. Waste collection Bins are kept at various points.

#### **Photograph of Waste Collection Bin:**



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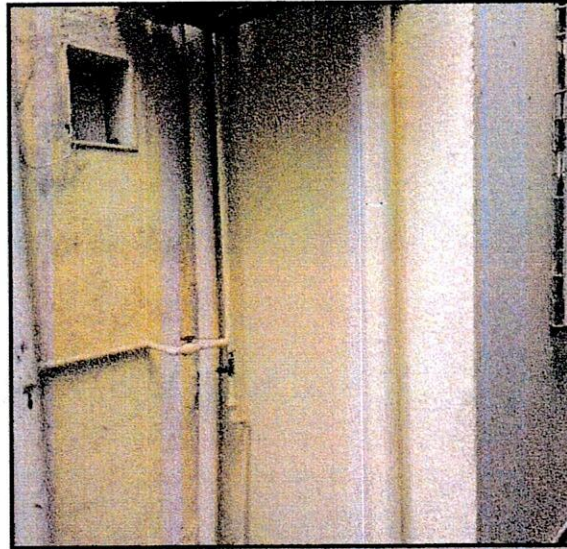
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## **CHAPTER-VI STUDY OF RAIN WATER MANAGEMENT**

The Rain water falling on terrace is used to increase the Underground Water Table.

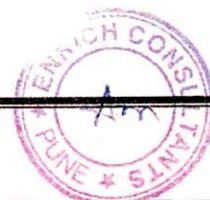
**Photograph of Rain Water Collecting Pipe:**



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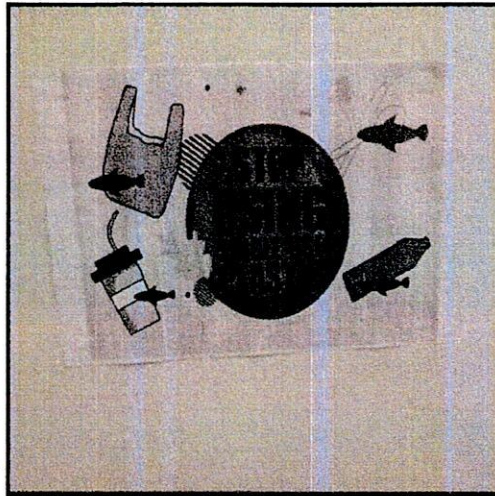


## **CHAPTER-VII STUDY OF ECO FRIENDLY PRACTICES**

### **7.1 Creation of Awareness about Ban on Single Use Plastic:**

The College has displayed posters emphasizing on importance of Ban on Single Use Plastic.

**Photograph of Ban on Single Use Plastic:**



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**ANNEXURE-I:  
INDOOR 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 +

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**ANNEXURE-I:  
INDOOR AIR QUALITY STANDARDS:**

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