

**ENVIRONMENTAL AUDIT REPORT**  
Of  
**SIPNA SHIKSHAN PRASARAK MANDAL AMRAVATI'S**  
**Arts Science & Commerce College**  
**Chikhaldara**



Year: 2020-21

Prepared by:

**Enrich Consultants**

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**

An ISO 9001 : 2000 Reg. no. : RQ 91 / 2462



**Maharashtra Energy Development Agency**

(Government of Maharashtra Institution)

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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.

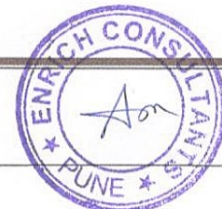
**Name and Address of the firm** : **M/s Enrich Consultants**  
Yashashree, Plot No. 26, Nirmal Bag Society,  
Near Muktangan English School, Parvati,  
Pune - 411009.

**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 **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)



# Enrich Consultants

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Tel: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)

Ref: EC/SSPMAASCCC/20-21/03

Date: 12/8/2021

## CERTIFICATE

This is to certify that we have conducted Environmental Audit at Sipna Shikshan Prasarak Mandal Amravati's Arts, Science & Commerce College, Upper Plateau Chikhaldara 444807, in the Academic year 2020-21.

The College has adopted following Green Initiatives:

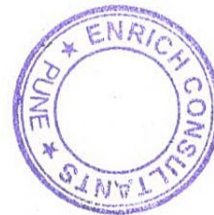
- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Segregation of Waste at source
- Provision of Bio Composting Pit
- Implementation of Rain Water Harvesting Project
- Tree Plantation in the campus
- Display of Poster on Plastic Ban
- Tree Plantation Drive in the campus
- Cleanliness Drive in the campus

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 Sipna Shikshan Prasarak Mandal Amravati's Arts, Science & commerce college, Upper Plateau Chikhaldara 444807, for awarding us the assignment of Environmental Audit of their Chikhaldara campus for the Year: 2020-21.

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





### 7.3 Liquid Waste Management:

For treatment of laboratory chemicals, the College has a soak tank wherein the laboratory liquid waste is first mixed with water and then drained to the soak Tank which contains layers of sand and activated carbon.

### 7.4 E-Waste Management:

It is recommended to handover the E Waste through Authorized E-Waste collecting agency.

### 8. Rain Water Harvesting:

The College has installed Rain Water Harvesting Project, wherein the Rain Water falling on the terrace is collected and is stored in a separate Water Storage Tank. The Water is further used for domestic purpose.

### 9. Environment Friendly Initiatives:

- Maintenance of Internal Garden
- Display of Poster on Plastic Ban
- Tree Plantation Drive in the campus
- Cleanliness Drive in the campus

### 10. Notes & Assumptions:

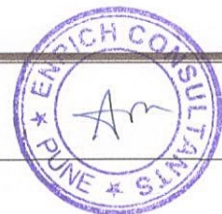
- 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

### 11. References:

- For CO<sub>2</sub> Emissions: [www.tatapower.com](http://www.tatapower.com)
- For Various Indoor Air Parameters: [www.ishrae.com](http://www.ishrae.com)

## **ABBREVIATIONS**

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LED	:	Light Emitting Diode
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers





## 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 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 Resource Consumption & CO<sub>2</sub> Emissions
2. To Study CO<sub>2</sub> Emission Reduction
3. To study Indoor Comfort Condition Parameters
4. To Study of Waste Management
5. To Study of Rain Water Harvesting
6. To Study of Sustainable Initiatives

### 1.3 Aerial View of the College:



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

No	Head	Particulars
1	Name of Institution	Sipna Shikshan Prasarak Mandal Amravati's Arts Science & Commerce College
2	Address	Upper Plateau, Chikhaldara 444807
3	Affiliation	Sant Gadgebaba Amravati University

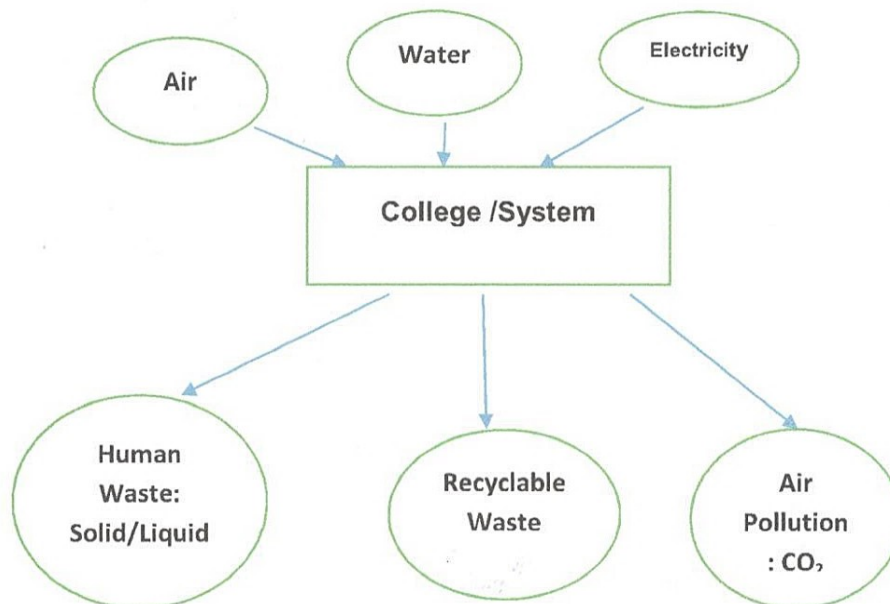


## CHAPTER-II STUDY OF CONSUMPTION OF RESOURCES & CO<sub>2</sub> EMISSION

The Institute 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.



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

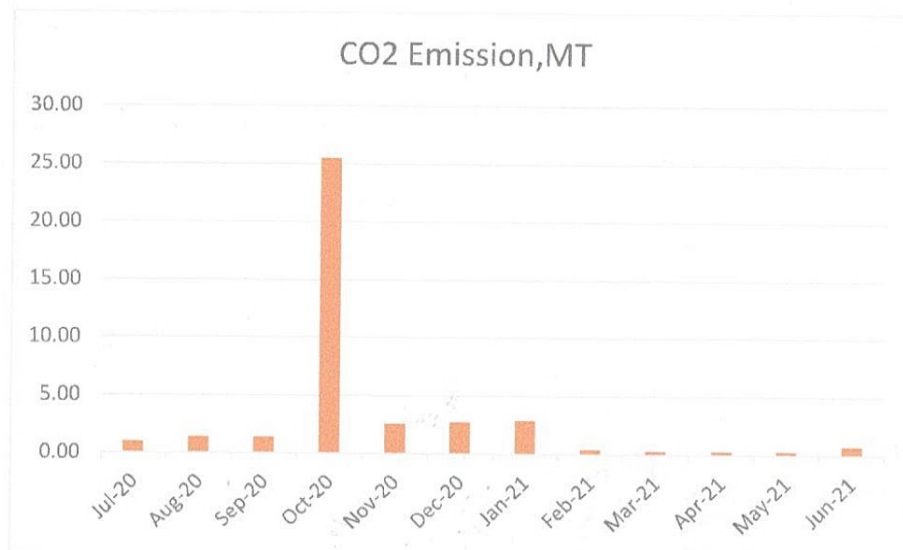
- 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

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

No	Month	Energy Purchased-Meter-1, kWh	Energy Purchased-Meter-2, kWh	Total Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-20	1000	58	1058	0.95
2	Aug-20	1000	576	1576	1.42
3	Sep-20	1000	576	1576	1.42
4	Oct-20	22824	5475	28299	25.47
5	Nov-20	2636	223	2859	2.57
6	Dec-20	2636	378	3014	2.71

7	Jan-21	2636	535	3171	2.85
8	Feb-21	79	349	428	0.39
9	Mar-21	19	294	313	0.28
10	Apr-21	0	309	309	0.28
11	May-21	3	308	311	0.28
12	Jun-21	511	333	844	0.76
13	Total	34344	9414	43758	39.38
14	Maximum	22824	5475	28299	25.47
15	Minimum	0	58	309	0.28
16	Average	2862	784.5	3646.5	3.28

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



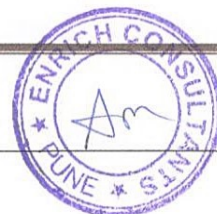
**Table No 6: Important Parameters:**

No	Parameter/ Value	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Total	43758	39.38
2	Maximum	28299	25.47
3	Minimum	309	0.28
4	Average	3646.5	3.28

### **CHAPTER III**

## **STUDY OF CO<sub>2</sub> EMISSION REDUCTION**

The College has yet to install Roof Top Solar PV Plant. Therefore as on the Date, the usage of Alternate Energy is nil.



## CHAPTER IV 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 7: Study of Indoor Comfort Condition Parameters:**

No	Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	226	83	1332	67
2	Minimum	21.2	69	204	51

## **CHAPTER V STUDY OF WASTE MANAGEMENT**

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

The recyclable waste, like paper, plastic waste is segregated at source and is handed over to Authorized waste collecting agent for further recycling.

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



### **5.2 Organic Waste Management:**

The Bio degradable waste like leafy waste is composted in a Bio Composting Pit.

#### **Photograph of Vermi Composting Pit:**





### 5.3 Liquid Waste Management:

For treatment of laboratory chemicals, the College has a soak tank wherein the laboratory liquid waste is first mixed with water and then drained to the soak Tank which contains layers of sand and activated carbon.

#### Photograph of Liquid Waste Soak Tank arrangement:



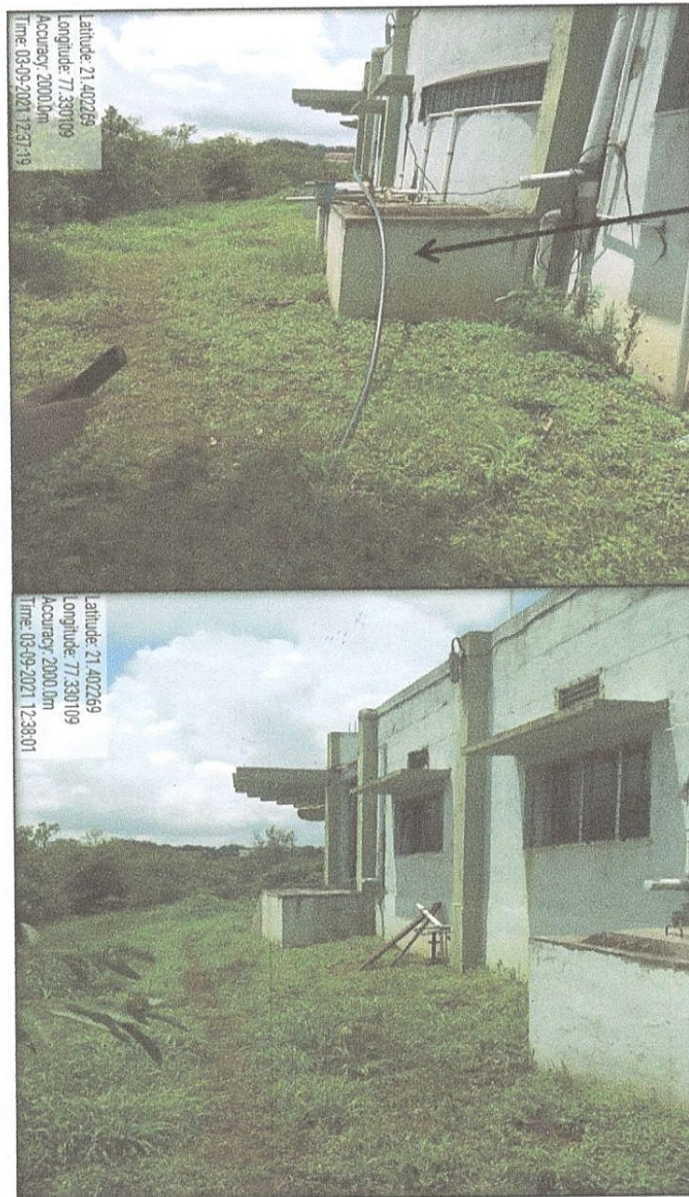
### 5.4 E-Waste Management:

It is recommended to handover the E Waste through Authorized E-Waste collecting agency.

## CHAPTER-VI STUDY OF RAIN WATER HARVESTING

The College has installed Rain Water Harvesting Project, wherein the Rain Water falling on the terrace is collected and is stored in a separate Water Storage Tank. The Water is further used for domestic purpose.

### Photograph of Rain Water Storage Tank Facility:

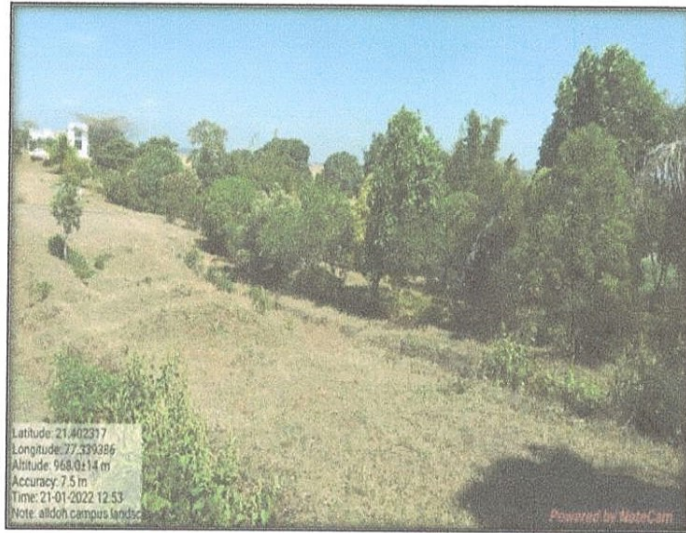


## CHAPTER-VII STUDY OF GREEN & SUSTAINABLE PRACTICES

### 7.1 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

#### Photograph of Tree plantation:



### 7.2 Creation of Awareness on Plastic Free Campus:

The College is creating awareness on Plastic Ban by Display of Posters.

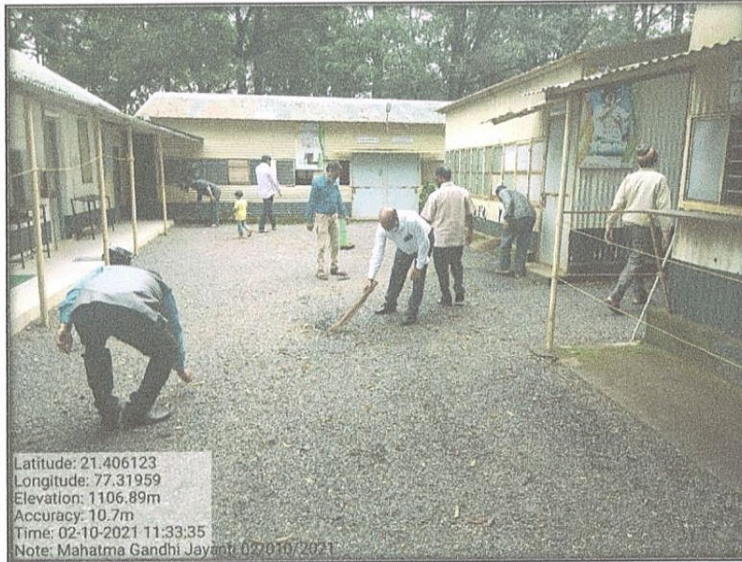
#### Photograph of Poster on Plastic Ban:



### 7.3 Cleanliness Drive:

The College arranged Cleanliness Drive in the Campus under National Service Scheme.

#### Photograph of Cleanliness Drive:



### 7.4 Tree Plantation Drive:

The College arranged Tree Plantation Drive in the Campus under National Service Scheme.

#### Photograph of Cleanliness Drive:



**ANNEXURE-I:  
RECOMMENDED NOISE & INDOOR COMFORT STANDARDS:**

**1. 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

**2. Thermal Comfort Conditions: For Non-conditioned Buildings:**

No	Parameter	Value
1	Temperature	Less Than 33 <sup>0</sup> C
2	Humidity	Less Than 70%