Report

On

Green Audit

At

Shri Shivaji Education Society, Amravati's

Jijamata Mahavidyalaya Buldana

(Year 2023-24)

Prepared by

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Contents

Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya, Buldhana for awarding us the assignment of Green Audit of their college premises.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures and green practices. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.

Executive Summary

Green Audit of Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya, Buldhana is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

1. Present Energy Consumption

Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya Buldhana uses Electrical Energy as the source of Energy for various equipments in the college campus. In the following Table, we present the details of Energy Consumption.

Table No. 1: Details of energy consumption

Sr. No.	Parameter	Energy consumed, (Units)	CO_2 Emission (MT)
1	Maximum	1,455	**1.2**
2	Minimum	298	**0.2**
3	Average	919	**0.7**
4	**Total**	**11,029**	**8.8**

2. Various Measures Adopted for Energy Conservation

1. Usage of STAR Rated ACs at new installations
2. Usage of LED lights at some indoor locations
3. Usage of LED Lights for outdoor lighting.

3. Usage of Renewable Energy

The college has installed solar PV panel of 20 kW capacity.

4. Rain Water Harvesting

The College has installed the Rain water harvesting project,to reduce dependency on municipal corporation water supply.

5. Waste Management

The College has already installed a Biocomposting Plant, wherein,the bio-degradable waste is composted & is used as fertilizer for the garden.

The internal communication is through emails and hence there is hardly any generation of e-Waste in the premises.

6. Notes and Assumptions

1. Daily working hours-10Nos
2. Annual working Days-250 Nos
3. Average Rate of Electrical Energy: **Rs 11/-per kWh**

Abbreviations

CFL	:	Compact Fluorescent Lamp
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
V	:	Voltage
I	:	Current
kW	:	Kilo-Watt
kWh	:	kilo-Watt Hour
kVA	:	Active Power

1. Introduction

Jijamata Mahavidyalaya Buldhana is run by Shri Shivaji Education Society, Amravati founded by a great visionary, Educationist and first Agricultural Minister of India, Late Dr. Panjabrao alias Bhausaheb Deshmukh in 1956. The college started with Arts faculty later commerce faculty was added in1964. Faculty of science is started in 1984. Since then, the college is imparting education in the faculty of Arts, Commerce and Science, Junior College, MCVC to Graduation, Post-Graduation and Doctoral Research Programs. College has competent staff. College has well equipped Laboratories, Botanical Garden, rich central & departmental library, beautiful campus, hostel and a vast playground. University Grants Commission, New Delhi has awarded the status of "College with Potential for Excellence" in 2010.

Objectives

1. To study present level of Energy Consumption
2. To Study the present CO_2 emissions
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To measure various Electrical parameters
5. To study Scope for usage of Renewable Energy
6. To study various measures to reduce the Energy Consumption

Audit methodology

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with pay back analysis

2. Study of Electrical Energy Consumption

In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

Table No. 2. 1: Summary of electricity bills

Sr. No.	Month	Energy (kWh)	Bill Amount (Rs)
1	Jun-24	442	11720
2	May-24	298	3252
3	Apr-24	500	5149
4	Mar-24	400	3967
5	Feb-24	631	6052
6	Jan-24	1161	10739
7	Dec-23	1039	9550
8	Nov-23	1156	10442
9	Oct-23	1306	11488
10	Sep-23	1455	12743
11	Aug-23	1424	12241
12	Jul-23	1217	10528
	Total	11,029	**1,07,871**

Variation in energy consumption is as follows,

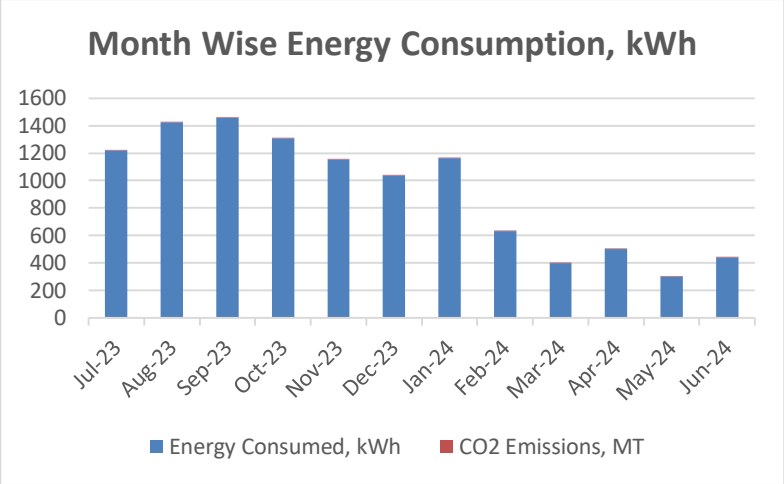


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

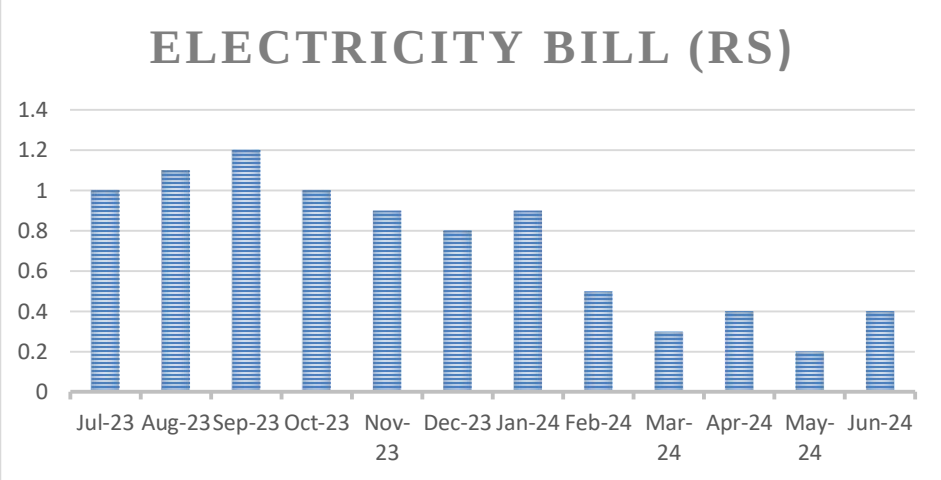


Figure 2.2: Month wise electricity bill

Key observations of electricity bill area follow,

Table No. 2.2: Key Observations

Sr. No.	Parameter	Energy consumed, (Units)	CO_2 Emission (MT)
1	Maximum	1,455	1.8
2	Minimum	298	0.0
3	Average	919	0.7
4	**Total**	**11,029**	**7.8**

3. Carbon Foot printing

1. A Carbon Foot print is defined as the Total Greenhouse Gas emissions (CO_2 emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day-to-day activities

2. Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- 1Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere.

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day-to-Day operations

We here with furnish the details of various forms of Energy consumption as under

Table 3.1: Month wise Consumption of Electrical Energy & CO_2 Emissions

Sr. No.	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jun-24	442	0.4
2	May-24	298	0.2
3	Apr-24	500	0.4
4	Mar-24	400	0.3
5	Feb-24	631	0.5
6	Jan-24	1,161	0.9
7	Dec-23	1,039	0.8
8	Nov-23	1,156	0.9
9	Oct-23	1,306	1.0
10	Sep-23	1,455	1.2
11	Aug-23	1,424	1.1
12	Jul-23	1,217	1.0
	Total	11,029	8.8

In the following Chart we present the CO_2 emissions due to usage of Electrical Energy.

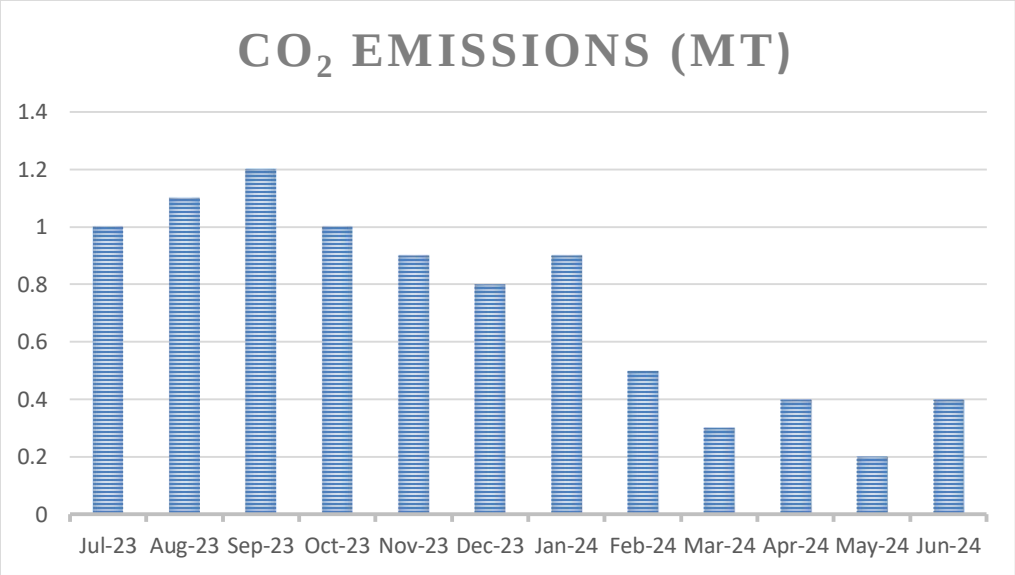


Figure 3.1: Month wise CO_2 Emission

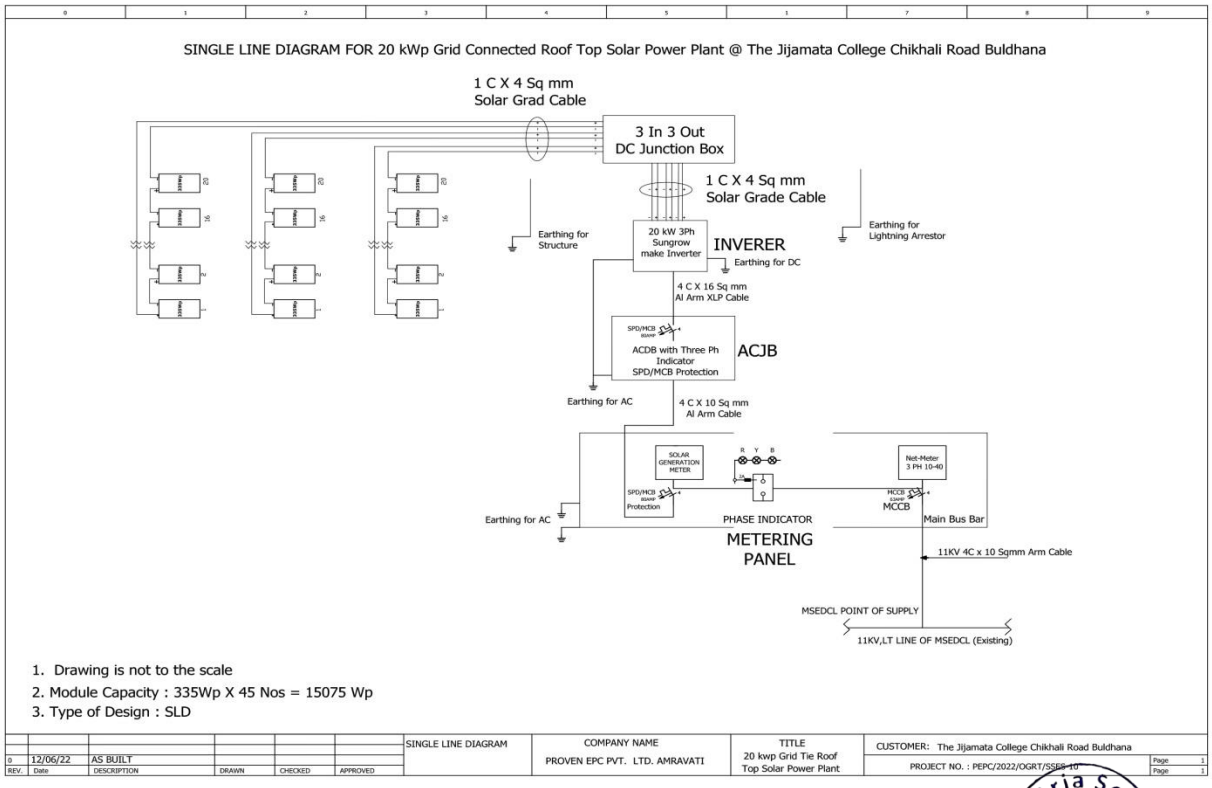
4. Study of Usage of Alternate Energy

In this Chapter, we compute the percentage of Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College. The College has installed Roof Top Solar PV System. The Installed Capacity of Solar PV Plant is **20 k Wp**.

Table 4.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	9,767	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	30,000	kWh/Annum
3	Total Energy Requirement of College	39,767	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	75	%

Photograph of Solar PV plant



5. Study of Rain water conservation system

The College already has Rain water conservation system, wherein the rain waterfalling on the terrace and other ground area of campus is collected and through natural slope/pipes it is fed to water storage pond. The open well is recharged by this pond. This stored water is then reused for domestic purpose.

Photograph of water conservation system

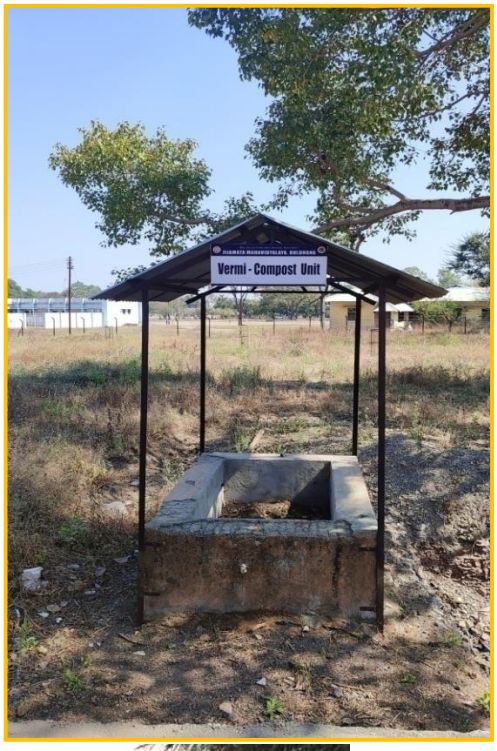
Open well Recharge by
CONSTRUCTION OF POND

6. Study of Waste Management

Solid Waste Management

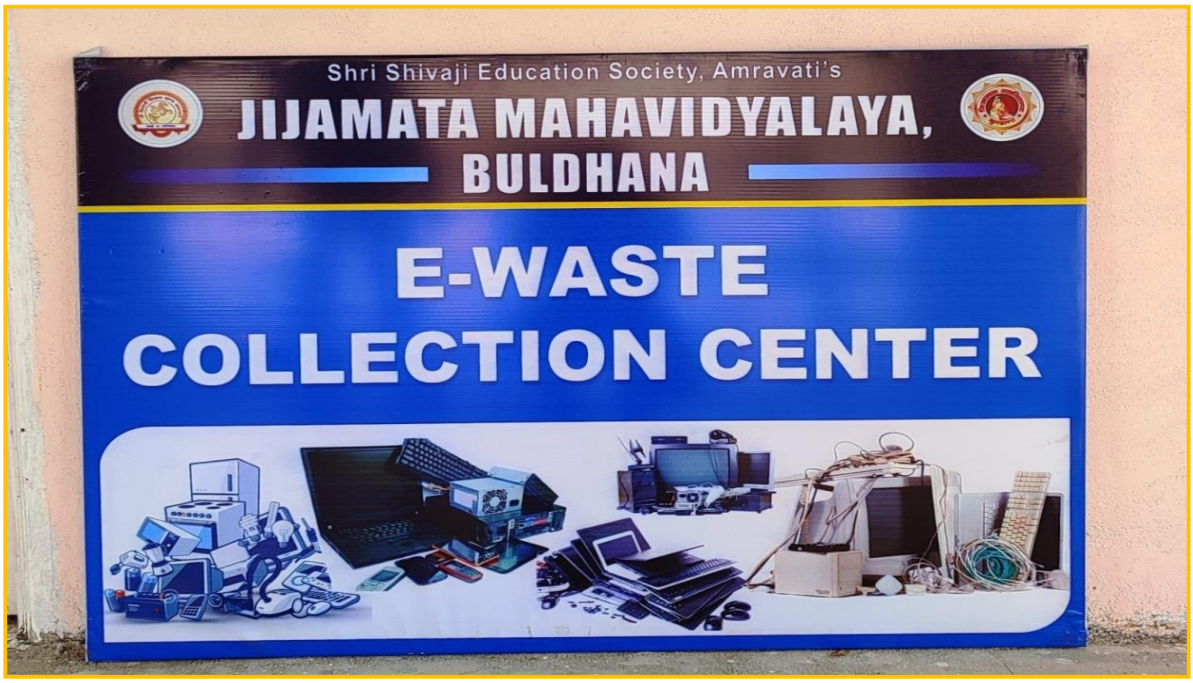
The College has already installed a Bio-composting Plant, where in, the bio-degradable waste is composted & issued as fertilizer for the garden.

Photographs of Bio-Composting Storage Tanks:



e-Waste Management

The internal communication is through emails and there is hardly any generation of e- Waste in the premises. The E-waste materials are collected from departments by the committee and with the approval of CDC and Principal are sold as scrap to recycling agencies.



Form-6
[SEE E WASTE (MANAGEMENT) RULES, 2016)- RULE 19]
E WASTE MANIFEST

1	Sender's name and mailing address (Including Phone No.)	Jijamata Arts, Commerce & Science Mahavidyalaya, Buldhana
2	Sender's Authorization No., if applicable.	
3	Manifest Document No.	JM/ E WASTE / 23-24/01
4	Transporter's Name & Address (Including Phone No.)	
5	Type of Vehicle	(Truck / Tanker / Special Vehicle)
6	Transporter's Registration No.	
7	Vehicle Registration No.	
8	Receiver's Name & Mailing Address (Including Phone No)	Suritex Private Ltd Works , B - 111 , MIDC , Butibori, Office: 5-6Zal Complex, Residency Road Sadar, Nagpur – 440001, Mobile No. :- 09049981347
9	Receiver's Authorization No. if applicable	MPCB/RO(HQ)/HSMD/Autho/2021/EW-28
10	Description of E-Waste (Item, Weight/ Numbers)	E Waste
11	Name and stamp of Sender* (Manufacturer or Producer or Bulk Consumer or Collection Centre or Refurbisher or Dismantler): Jijamata Arts, Commerce & Science Mahavidyalaya, Buldhana Typed Name & Stamps: Principal Jijamata Mahavidyalaya, Buldana (Maharashtra) Signature Month Day Year: 10/12/2023	
12	Transporter Acknowledgement of Receipt of E Waste Typed Name & Stamps: Principal Jijamata Mahavidyalaya, Buldana (Maharashtra) Signature Month Day Year: 10/12/2023	
13	Receiver* (Collection Centre or Refurbisher or Dismantler or Recycler)certification of receipt of E-waste) Suritex Private Ltd Works , B - 111 , MIDC , Butibori, Office: 5-6Zal Complex, Residency Road Sadar, Nagpur – 440001, Mobile No. :- 09049981347 Typed Name & Stamps: Signature SURITEX PRIVATE LIMITED NAGPUR Month Day Year: 10/12/2023	

*** As applicable**

COPY 1 (YELLOW)	TO BE RETAINED BY THE SENDER AFTER TAKING SIGNATURE ON IT FROM THE TRANSPORTER AND OTHER THREE COPIES WILLBE CARRIED BY TRANSPORTER.
COPY 2 (PINK)	TO BE RETAINED BY THE RECEIVER AFTER SIGNATURE OF THE TRANSPORTER.
COPY 3 (ORANGE)	TO BE RETAINED BY THE TRANSPORTER AFTER TAKING SIGNATURE OF THE RECEIVER.
COPY 4 (GREEN)	TO BE RETURNED BY THE RECEIVER WITH HIS/HER SIGNATURE TO THE SENDER

Nutan Urja Solutions

Form-6

[SEE E WASTE (MANAGEMENT) RULES, 2016)- RULE 19]

E WASTE MANIFEST

1	Sender's name and mailing address (Including Phone No.)	**Jijamata Arts, Commerce & Science Mahavidyalaya, Buldhana**
2	Sender's Authorization No., if applicable.	
3	Manifest Document No.	**JM/ E WASTE / 23-24/01**
4	Transporter's Name & Address (Including Phone No.)	
5	Type of Vehicle	**(Truck / Tanker / Special Vehicle)**
6	Transporter's Registration No.	
7	Vehicle Registration No.	
8	Receiver's Name & Mailing Address (Including Phone No)	**Suritex Private Ltd Works , B - 111 , MIDC , Butibori, Office: 5-6Zal Complex, Residency Road Sadar, Nagpur – 440001, Mobile No. :- 09049981347**
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10	Description of E-Waste (Item, Weight/ Numbers)	**E Waste**
11	Name and stamp of Sender* (Manufacturer or Producer or Bulk Consumer or Collection Centre or Refurbisher or Dismantler): **Jijamata Arts, Commerce & Science Mahavidyalaya, Buldhana** **Typed Name & Stamps:** Principal Jijamata Mahavidyalaya, Buldana (Maharashtra) Signature	Month 10 Day 12 Year 2023
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Nutan Urja Solutions

श्री शिवाजी शिक्षण संस्था, अमरावती द्वारा संचालित

श्री शिवाजी विज्ञान महाविद्यालय

शिवाजी नगर, मोर्शी रोड, अमरावती-४४४ ६०३ (महा.)

NAAC Accredited by Grade "A" with CGPA of 3.42 (IV Cycle)
UGC Awarded Status of CPE (II Phase)
Identified by DST, Government of India for FIST, SGRAU Host College
ISO 9001 : 2015 Certified College & ref 2022 Rank Band : 151 - 200

श्री. हर्षवर्धन प्र. देशमुख
अध्यक्ष

डॉ. ग. वि. कोरपे
प्राचार्य

डॉ. पंजाबराव उपाख्य
भाऊसाहेब देशमुख

Ref. No. SC/ 8381/2023

Date 26/9/2023

प्रती,
प्राचार्य
जिजामाता महाविद्यालय,
बुलढाणा

संदर्भ:- पत्र क्र.जा.क्र.शि/अधी /५ /३२२३/२०२३ दि. २०.०९.२०२३

विषय:- आंतरराष्ट्रीय ई-कचरा दिनानिमीत्त "Electronic Waste Dump & Donate Drive" उपक्रमा अंतर्गत आपल्या महाविद्यालयामध्ये ई कचरा संकलन करण्याबाबत.

आदरणीय महोदय,

उपरोक्त विश्यांकित व संदर्भीय पत्राच्या अनुषंगाने कळविण्यात येते कि भाऊसाहेबांच्या १२५व्या जयंती निमित्त पर्यावरणशास्त्र विभाग श्री शिवाजी विज्ञान महाविद्यालय, अमरावती व सुरिटेक्स प्रायवेट लिमिटेड, नागपूर यांच्या मार्फत १४ ऑक्टोबर 2023 शनिवार रोजी आंतरराष्ट्रीय ई-कचरा दिनानिमीत्त श्री शिवाजी शिक्षण संस्था, अमरावती अंतर्गत येणाऱ्या सर्व शाळा व महाविद्यालय करिता "Electronic Waste Dump & Donate Drive" चे आयोजन केलेले आहे. याकरिता श्री शिवाजी शिक्षण संस्था, अमरावती च्या पत्रा नुसार आपल्या जिल्ह्यामधील शाळा व महाविद्यालय करिता आपले महाविद्यालय संकलन केंद्र म्हणून ठरविलेले आहे.

तरी आपणास नम्र विनंती आहे कि आपल्या कडे आलेला ई कचरा १३ ऑक्टोबर 2023 पर्यंत संकलित करावा. आपण संकलित केलेला ई कचरा श्री शिवाजी विज्ञान महाविद्यालय, अमरावतीला आणण्याची जबाबदारी मे. सुरिटेक्स प्रायवेट लिमिटेड नागपूर व श्री शिवाजी विज्ञान महाविद्यालय, अमरावती यांची राहील.

प्राचार्य

Dr. G. V. Korpe
Principal
Shri Shivaji Science College,
Amravati

7. Study of Green Practices

No of students who don't use own Vehicle for coming to Institute

Out of total students coming to Institute, about 60%students use own Automobile.

Usage of Public Transport

During the Students transport study, it was revealed that the local students who are residing near areas make use of Public Transport like Municipal Transport local buses, local sharing type auto rickshaws. Some students use bicycles.

Pedestrian Friendly Roads

The Institute has well defined pedestrian foot paths as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus

Plastic Free Campus

The Institute is an active participant in the Government of India's most prestigious project of SWATCHH BHART ABHIYAN. The Institute has displayed boards in the Campus, to make the campus plastic free. Various measures adopted for this purpose areas follow

- Installation of Separate waste bins for Dry waste & wet waste
- Usage of paper tea cups in the Institute canteen

- Display of boards in the campus for Plastic Free campus

Paperless Office

The internal communication of the Institute is through the Internet. There are hardly any day-to-day operations, where printing is required.

8. Green Land scaping with Trees and Plants

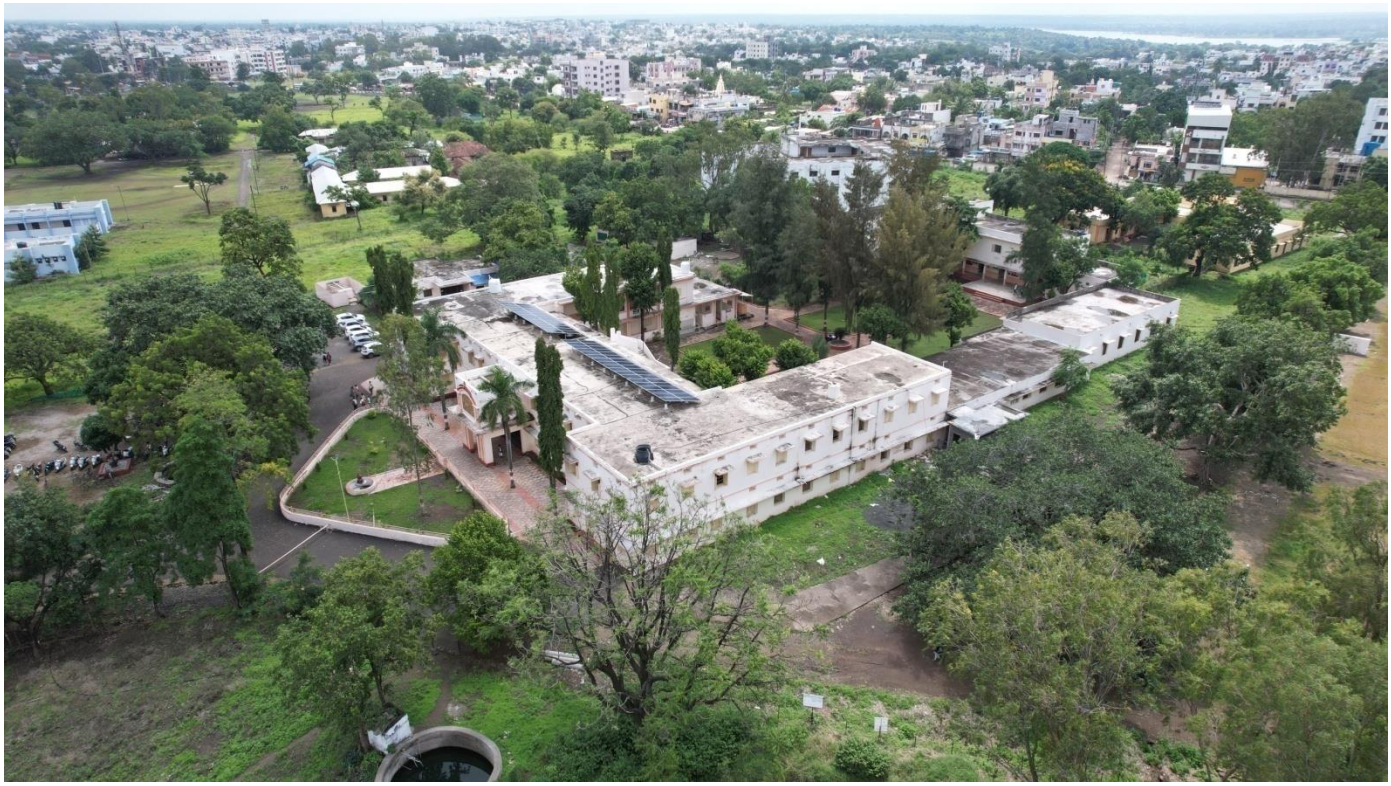
To understand the plant biodiversity of the campus, the college has been conducting census of tree, herbs and shrubs. The college campus has rich plant biodiversity including 25 tree species. The college has developed green house in botanical garden. Drip irrigation is used to water tree so garden.

List of trees is given in following table.

Table 8.1 List of trees in college campus

Sr. No.	Common Name	Botanical Name
1	Shisam	*Dalbergia sissoo*
2	Charoli	*Buchanania lanzan*
3	Palas	*Butea monosperma*
4	Hivar	*Vachellia leucophloea*
5	Kadulimb	*Azadirachta indica*
6	Ashoka	*Saraca asoca*
7	Pimple	*Ficus religiosa*
8	Behada	*Terminalia bellirica*
9	Jambhul	*Syzgium cumini*
10	Subabhul	*Leucaena leucocephala*
11	Maharukh	*Ailanthus excelsa*
12	Gulmohar	*Delonix regia*
13	Chinch	*Tomarindus indica*
14	Botal brush	*Callistemon viminalis*
15	Kanchan	*Bauhinia variegata*
16	Nilgiri	*Eucalyptus globulas*
17	Vad	*Ficus benghalensis*
18	Bamboo	*Bambusa vulgaris*
19	Karanj	*Milletia pinnata*
20	Botal pam	*Hyophorbe lagenicaulis*
21	Saru	*Casuarina equisetifolia*
22	Badam	*Terminalia catappa*
23	Sag	*Tectona grandis*
24	Ambha	*Mangifera indica*
25	Saptparni	*Alstonia scholaris*

Photographs of Green Landscaping with Trees and Plants



Photograph of Botanical Garden Develop by College

Green House