



PowerTech Energy Solutions
Conserve to Consume

Energy, Green & Environment Audit Report of

Loknete Dr. Balasaheb Vikhe Patil
(Padma Bhushan Awardee) Pravara Rural
Education Society

**Arts, Science & Commerce College,
Kolhar**

Submitted By

PowerTech Energy Solutions

Reg. Office: - 6, Vaikuntha Apt, Hire Nagar, Nashik-Pune Road, Nashik.422 011
Mumbai Office: Shop No.39, Gokul Nagri 1, Thakur Complex, 90 Feet Road, Kandivali (E), Mumbai. 400101
Pune Office: - 4th Floor, Devki Heights, Opp.Regent Hotel, Shivajinagar. 411 005
Mob. +91 9226936163, Email: info@ptesolutions.in

ENERGY, GREEN & ENVIRONMENT AUDIT COMPLETION CERTIFICATE

This is to certify that following utility has carried out Energy, Green & Environment Audit as per guidelines laid down in The Energy Conservation Act, 2001 in the month of July 2020

Name of the Institute	Loknete Dr. Balasaheb Vikhe Patil (Padma Bhushan Awardee) Pravara Rural Education Society Arts, Science & Commerce College, Kolhar
Details of Facilities Audited	All departments, Laboratories, Library , Etc
Date of Energy, Green & Environment Audit	06 July 2020
Name of Certified Energy Auditor	Mr. Swapnil Gaikwad
Certification No.	EA 20121
Validity of the Certificate	05 July 2021

Authorised Signatory

(Atul Kakad)

Executive Summary – Energy Audit

Sr. No	Area	Proposed Action	Expected Result	Saving Potential, kWh	Monetary Saving (Rs.)	Investment (Rs.)	Simple Payback Period (Months)
1	Fan system (Ceiling Fan)	Replace present ceiling fan consuming 78W with energy efficient fans consuming 40W. In the campus where usage is high this conservation measure will produce good savings	<ul style="list-style-type: none"> • Total number of fans in the campus =105 Nos. • Total number of fans used in the campus (considering Usage factor) = 105 Nos. • Number of fans to be replace = 105 Nos. • The Total Current Consumption =511 kWh • The Expected fan Consumption =272 kWh • Total kWh saved per month = 239 kWh 	239	2564	178500	70
	Total			239	2102	178500	85

Executive Summary – Green & Environment Audit

Sr.No	Area	Observations	Remark
1	Green Initiative	College has planted medical plant in botanical garden which is helpful for awareness regarding various species of trees	Good initiative taken by college toward green campus
2	E waste Management	At present, E -waste generated by college is sent to their Head office	College shall ensure that e-waste generated by them is channelised through collection centre or dealer of authorised producer or dismantler or recycler
3	Avoiding Use of Plastic & Paper in Campus	College is encouraging the use of digital assets such as digital library, notices ,etc	Good initiative taken by college
4	Liquid Waste Management	Rain water harvesting system is used to recharge the ground level water	Good initiative taken by college towards water conservation

Scope for Improvements

It is recommended that below initiatives can be taken by college management toward energy conservation and sustainable environment

1. Use of renewable energy source (Solar PV system with net metering facility)
2. Solid waste management – Proper functioning and maintenance of vermicopost which is available in college campus
3. Training & Seminars on “ Energy Conservation” , “ Climate Change”, Benefits of Renewable Energy” , etc. by external faculty

Table of Contents

Executive Summary – Energy Audit	3
Executive Summary – Green & Environment Audit	4
Scope for Improvements	4
1 About College	6
1.1 Our Vision	6
1.2 Our Mission	6
2 Energy Audit	7
2.1 Electricity Bill Analysis	7
2.2 Observations	9
3 Connected Load List	10
4 Performance Assessment of Lighting System	12
4.1 Observations	13
4.2 Type Wise Lighting Distribution.....	14
5 Performance of Fan System	15
5.1 Observations	17
6 Energy Saving Measures	18
6.1 Energy Saving Measure 1 – Replace present ceiling fan consuming 75W with energy efficient fans consuming 40W.....	18
7 Requirement of NAAC	21
7.1 Alternative Energy Initiative	21
7.2 Percentage of lighting power requirement met through LED bulbs	21
8 Green Audit	22
8.1 Goals of Green Audit	22
8.2 Benefits of Green Audit.....	23
9 Initiatives by College towards Sustainable Environment	24
9.1 Plantation of Medicinally important Plant in Botanical Garden	24
9.2 E- Waste Management Program	31
9.3 Initiative Taken to Avoid Use of Paper / Plastic, Etc. In College Campus	31
9.4 Rain Water Harvesting	32

1 About College

Arts, Science, and Commerce College, Kolhar is a NAAC accredited institution that began in 1999 with 10 teachers imparting education to 57 students in 2 departments. In 2019-20, the institute boasts of 33 teachers and 698 students spread across 15 departments. The college runs 7 undergraduate, 2 postgraduate, and 6 skill based courses.

With one well furnished library and 8 well equipped laboratories, our students have all the facilities to quench their thirst for knowledge and execute their creativity. We look forward to them launching the name of our institute to great heights.

Spread over 9 acres that includes 5 acres sports ground and 2000 square feet gymnasium, the college focuses on sports and co-curricular activities in equal measure for overall development of students.

1.1 Our Vision

To enable prosperity by providing quality education in emerging fields to produce knowledgeable and cultured human resource for the upliftment of the rural masses who contribute to the process of national development.

1.2 Our Mission

To empower the socially, economically and educationally marginalized sections of the society through quality education and transform them into excellent human beings who are aware that being sensitive, modest and humane is the hall mark of being educated, self-disciplined and civilized.

2 Energy Audit

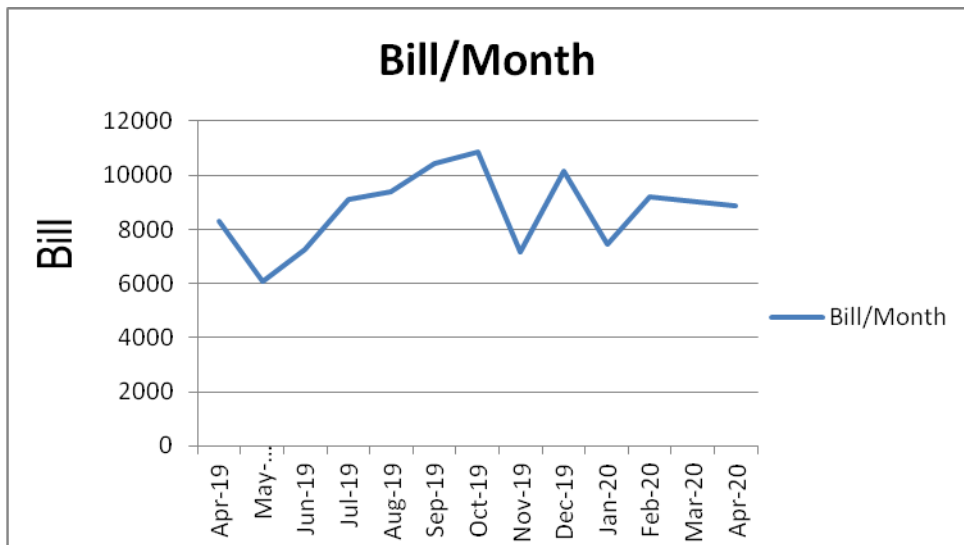
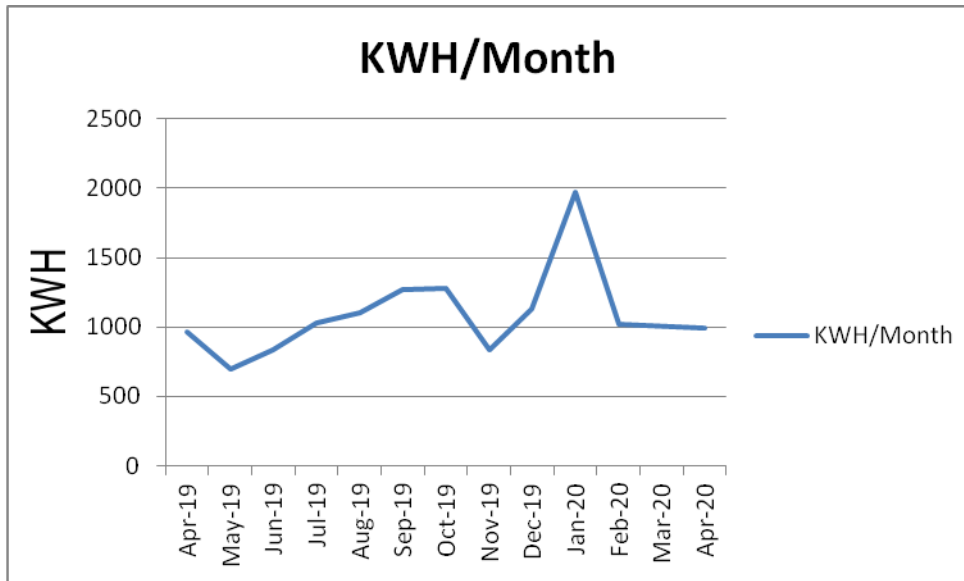
An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints.

2.1 Electricity Bill Analysis

College Electricity Bill No. 1

Electricity Bill	: Maharashtra State Electricity Distribution Co. Ltd		
CONSUMER	: THE PRIN.ART,SCIN & COMM COLL KOLHAR		
CONSUMER NO.	: 850280014773		
UTILITY	: MSEDCL		
TARIFF	: 073 /LT X		
CONNECTED LOAD (KW)	: 20 KW		
CONTRACT DEMAND (KVA)	:2.5 KW		
Month	kWh/Month	Bill/Month	Unit Rate
Apr-19	963	8310	8.6
May-19	701	6060	8.6
Jun-19	833	7250	8.7
Jul-19	1030	9110	8.8
Aug-19	1105	9370	8.5
Sep-19	1271	10410	8.2
Oct-19	1282	10840	8.5
Nov-19	840	7180	8.5
Dec-19	1131	10150	9.0
Jan-20	1970	7450	3.8
Feb-20	1019	9210	9.0
Apr-20	991	8860	8.9
Total	13,136	104200	
Average	1,095	8683	8.3

Below charts shows the graphical presentation of monthly energy consumption and bill



College Electricity Bill No. 2

Electricity Bill	: Maharashtra State Electricity Distribution Co. Ltd		
CONSUMER	: THE PRIN.ART,SCIN & COMM COLL KOLHAR		
CONSUMER NO.	: 850280056603		
UTILITY	: MSEDCL		
TARIFF	: 081 /LT IV		
CONNECTED LOAD (HP)	: 5HP		
CONTRACT DEMAND (HP)	: 5HP		
MONTH	KWH/Month	Bill/Month	Unit Rate
Mar-19	0	1220	-
Jun-19	0	3880	-
Sep-19	0	4400	-
Dec-19	0	3400	-
Mar-20	0	3290	-
Jun-20	0	3030	-
Sep-20	0	3580	-
Dec-20	0	1980	-
Total	0	24780	-
Average	0	3097	-

2.2 Observations

- Total monthly avg. energy consumption of the college campus is 1095 units
- Total annual energy consumption of the college is 13,136 units
- Total monthly avg. billing is Rs. 11780/-
- Average unit rate is 10.75 Rs.

3 Connected Load List

Below is the connected load of college

Sr. No.	Name of Department	Computer	Printer	Xerox Machine	CCTV Camera	Inverter	battery	Projector	Projector Screen	Projector Stand	UPS	Barcode Scanner	Bell	Sound/Speaker	Fire Extinguisher	Blor Drill	Auto Bell	Rack	Switch	Wifi/Router	DVR	Biometrics
1	Principal Office	1	1						1	1	1											
2	Waiting Room																					
3	Administrative Office	4	2		1						3											
4	Store Room	1																2			2	
5	Computer Lab	18	1	1	1	2	3	2	1		1			1				1	1	2		1
6	Ground Floor Passage				1										1							
7	Porch				3																	
8	NAAC Room	2	0					1	1	1	2											
9	Power House															1						
10	Student Section	4	1		1	1	2				3								1			
11	Chemistry Lab	1			1										2							
12	Canteen																					
13	VLC Hall				1			1	1	1				3								
14	Geography							1	0											1		
15	Botany Lab	1			1																	
16	Library	8	1		2	1	2					2		1			1	1			1	
17	Zoology Lab	1																				
18	Physics Lab	1			1																	
19	Block No. 9 & 10	0			1								1									

Energy ,Green & Environment Audit Report – Loknete Dr. Balasaheb Vikhe Patil (Padma Bhushan Awardee) Pravara Rural Education Society
Arts, Science & Commerce College, Kolhar

Sr. No.	Name of Department	Computer	Printer	Xerox Machine	CCTV Camera	Inverter	battery	Projector	Projector Screen	Projector Stand	UPS	Barcode Scanner	Bell	Sound/Speaker	Fire Extinguisher	Blor Drill	Auto Bell	Rack	Switch	Wifi/Router	DVR	Biometrics	
20	NSS Office													1									
21	Second Floor				1																		
22	Commerce Dept	1	1		1																		
23	Exam Section	2	1	1	2						1								1				
24	Staff Room		1		1																		
25	English Dept.		2					1	1	1								1	1	1			
26	Block No. 1 & 2				1																		
27	Block No. 3				1																		
28	Third Floor Passage				1																		
29	Block No. 4				1																		
30	Block No. 5				1																		
31	Block No. 06				1																		
32	Block No. 7 & 8				1																		
33	Tower																						
34	Security Dept.				2																		
35	Gymkhana				1																	1	
36	Ladies Hostel																						
37	Open space				3																		
38	Women Emp. Cell																						
39	Economics Dept		1																				
	Total	45	12	2	32	4	7	6	5	4	11	2	1	5	4	1	1	5	4	4	4	4	1

4 Performance Assessment of Lighting System

Lighting load of the college is shown in below table. All lights are changed into energy efficient LED system

Sr. No	Name of Department	Type of Fitting	Wattage	Total Quantity	Load in kW	Daily Working Hrs	Monthly Working Days	Monthly kWh
1	Principal Office	LED Tube	20	4	0.08	6	24	11.52
2	Waiting Room	LED Tube	20	1	0.02	6	24	2.88
3	Administrative Office	LED Tube	20	3	0.06	6	24	8.64
4	Store Room	LED Tube	20	1	0.02	6	24	2.88
5	Computer Lab	LED Tube	20	4	0.08	6	24	11.52
6	Ground Floor Passage	LED Tube	20	5	0.1	6	24	14.4
7	Porch	LED Tube	20	1	0.02	6	24	2.88
8	NAAC Room	LED Tube	20	4	0.08	6	24	11.52
9	Power House	LED Tube	20	13	0.26	6	24	37.44
10	Student Section	LED Tube	20	3	0.06	6	24	8.64
11	Chemistry Lab	LED Tube	20	10	0.2	6	24	28.8
12	Canteen	LED Tube	20	4	0.08	6	24	11.52
13	VLC Hall	LED Tube	20	6	0.12	6	24	17.28
14	Geography	LED Tube	20	4	0.08	6	24	11.52
15	Botany Lab	LED Tube	20	6	0.12	6	24	17.28
16	Library	LED Tube	20	11	0.22	6	24	31.68
17	Zoology Lab	LED Tube	20	7	0.14	6	24	20.16
18	Physics Lab	LED Tube	20	5	0.1	6	24	14.4
19	Block No. 9 & 10	LED Tube	20	4	0.08	6	24	11.52
20	NSS Office	LED Tube	20	1	0.02	6	24	2.88
21	Second Floor	LED Tube	20	3	0.06	6	24	8.64
22	Commerce Dept	LED Tube	20	3	0.06	6	24	8.64
23	Exam Section	LED	20	1	0.02	6	24	2.88

Sr. No	Name of Department	Type of Fitting	Wattage	Total Quantity	Load in kW	Daily Working Hrs	Monthly Working Days	Monthly kWh
		Tube						
24	Staff Room	LED Tube	20	2	0.04	6	24	5.76
25	English Dept.	LED Tube	20	3	0.06	6	24	8.64
26	Block No. 1 & 2	LED Tube	20	2	0.04	6	24	5.76
27	Block No. 3	LED Tube	20	1	0.02	6	24	2.88
28	Third Floor Passage	LED Tube	20	1	0.02	6	24	2.88
29	Block No. 4	LED Tube	20	1	0.02	6	24	2.88
30	Block No. 5	LED Tube	20	1	0.02	6	24	2.88
31	Block No. 06	LED Tube	20	1	0.02	6	24	2.88
32	Block No. 7 & 8	LED Tube	20	1	0.02	6	24	2.88
33	Tower	LED Tube	20	3	0.06	6	24	8.64
34	Security Dept.	LED Tube	20	1	0.02	6	24	2.88
35	Gymkhana	LED Tube	20	10	0.2	6	24	28.8
36	Women Emp. Cell	LED Tube	20	1	0.02	6	24	2.88
37	Toilet	LED Tube	20	4	0.08	6	24	11.52
Total				136	2.72			392

4.1 Observations

- There are total 136 LED lights in campus
- Total lighting load is 2.72 kW
- Monthly lighting energy consumption is 392 units

4.2 Type Wise Lighting Distribution

Type	Qty	kW Load	% Load
LED Lights	136	2.71	100
Conventional Lights	0	0	0
Total	136	2.71	

5 Performance of Fan System

Below table shows the assessment of ceiling fans

Sr. No	Location	Type of Fitting	Wattage	Total Quantity	Load in kW	Daily Working Hrs	Monthly Working Days	Monthly kWh
1	Principal Office	Ceiling Fan	75	3	0.225	4	24	21.6
2	Waiting Room	Ceiling Fan	75	1	0.075	1	24	1.8
3	Administrative Office	Ceiling Fan	75	3	0.225	4	24	21.6
4	Store Room	Ceiling Fan	75	1	0.075	4	24	7.2
5	Computer Lab	Ceiling Fan	75	6	0.45	4	24	43.2
6	Ground Floor Passage	Ceiling Fan	75		0	1	24	0
7	Porch	Ceiling Fan	75		0	1	24	0
8	NAAC Room	Ceiling Fan	75	6	0.45	2	24	21.6
9	Power House	Ceiling Fan	75	2	0.15	2	24	7.2
10	Student Section	Ceiling Fan	75	2	0.15	4	24	14.4
11	Chemistry Lab	Ceiling Fan	75	8	0.6	2	24	28.8
12	Canteen	Ceiling Fan	75	4	0.3	4	24	28.8
13	VLC Hall	Ceiling Fan	75	5	0.375	4	24	36
14	Geography	Ceiling Fan	75	3	0.225	2	24	10.8
15	Botany Lab	Ceiling Fan	75	4	0.3	2	24	14.4
16	Library	Ceiling Fan	75	6	0.45	4	24	43.2
17	Zoology Lab	Ceiling Fan	75	3	0.225	2	24	10.8
18	Physics Lab	Ceiling Fan	75	5	0.375	2	24	18
19	Block No. 9 & 10	Ceiling Fan	75	6	0.45	2	24	21.6
20	NSS Office	Ceiling Fan	75		0	2	24	0
21	Second Floor	Ceiling Fan	75		0	1	24	0
22	Commerce Dept	Ceiling Fan	75	4	0.3	2	24	14.4
23	Exam Section	Ceiling Fan	75	2	0.15	2	24	7.2
24	Staff Room	Ceiling Fan	75	3	0.225	3	24	16.2
25	English Dept.	Ceiling Fan	75	4	0.3	2	24	14.4
26	Block No. 1 & 2	Ceiling Fan	75	4	0.3	2	24	14.4

Energy ,Green & Environment Audit Report – Loknete Dr. Balasaheb Vikhe Patil (Padma Bhushan Awardee) Pravara Rural Education Society
Arts, Science & Commerce College, Kolhar

Sr. No	Location	Type of Fitting	Wattage	Total Quantity	Load in kW	Daily Working Hrs	Monthly Working Days	Monthly kWh
27	Block No. 3	Ceiling Fan	75	2	0.15	2	24	7.2
28	Third Floor Passage	Ceiling Fan	75		0	1	24	0
29	Block No. 4	Ceiling Fan	75	2	0.15	2	24	7.2
30	Block No. 5	Ceiling Fan	75	2	0.15	2	24	7.2
31	Block No. 06	Ceiling Fan	75	2	0.15	2	24	7.2
32	Block No. 7 & 8	Ceiling Fan	75	4	0.3	2	24	14.4
33	Tower	Ceiling Fan	75		0	2	24	0
34	Security Dept.	Ceiling Fan	75	2	0.15	4	24	14.4
35	Gymkhana	Ceiling Fan	75	4	0.3	4	24	28.8
36	Women Emp. Cell	Ceiling Fan	75	2	0.15	2	24	7.2
37	Toilet	Ceiling Fan	75		0	1	24	0
Total				105	7.875			511.2

5.1 Observations

- There are total 105 ceiling fans in college
- Total ceiling load is 7.85 kW
- Monthly fan energy consumption is 511 units which is almost 62% of total consumption

6 Energy Saving Measures

6.1 Energy Saving Measure 1 – Replace present ceiling fan consuming 75W with energy efficient fans consuming 40W

Sr. No	Location	Qty	Wattage	Fan Type	Op Hr	Mthly kWh	Change	New Wattage	New kWh	Saving kWh	Saving (Rs)	Unit Price (Rs)	Investment (Rs)	Payback (Months)
1	Principal Office	3	75	Ceiling Fan	4	21.6	40W EE Fan	40	11.52	10.08	89	1700	5100	57
2	Waiting Room	1	75	Ceiling Fan	1	1.8	40W EE Fan	40	0.96	0.84	7	1700	1700	230
3	Administrative Office	3	75	Ceiling Fan	4	21.6	40W EE Fan	40	11.52	10.08	89	1700	5100	57
4	Store Room	1	75	Ceiling Fan	4	7.2	40W EE Fan	40	3.84	3.36	30	1700	1700	57
5	Computer Lab	6	75	Ceiling Fan	4	43.2	40W EE Fan	40	23.04	20.16	178	1700	10200	57
6	Ground Floor Passage	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
7	Porch	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
8	NAAC Room	6	75	Ceiling Fan	2	21.6	40W EE Fan	40	11.52	10.08	89	1700	10200	115
9	Power House	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
10	Student Section	2	75	Ceiling Fan	4	14.4	40W EE Fan	40	7.68	6.72	59	1700	3400	57
11	Chemistry Lab	8	75	Ceiling Fan	2	28.8	40W EE Fan	40	15.36	13.44	118	1700	13600	115
12	Canteen	4	75	Ceiling Fan	4	28.8	40W	40	15.36	13.44	118	1700	6800	57

Energy ,Green & Environment Audit Report – Loknete Dr. Balasaheb Vikhe Patil (Padma Bhushan Awardee) Pravara Rural Education Society
Arts, Science & Commerce College, Kolhar

Sr. No	Location	Qty	Wattage	Fan Type	Op Hr	Mthly kWh	Change	New Wattage	New kWh	Saving kWh	Saving (Rs)	Unit Price (Rs)	Investment (Rs)	Payback (Months)
				Fan			EE Fan							
13	VLC Hall	5	75	Ceiling Fan	4	36	40W EE Fan	40	19.2	16.8	148	1700	8500	57
14	Geography	3	75	Ceiling Fan	2	10.8	40W EE Fan	40	5.76	5.04	44	1700	5100	115
15	Botany Lab	4	75	Ceiling Fan	2	14.4	40W EE Fan	40	7.68	6.72	59	1700	6800	115
16	Library	6	75	Ceiling Fan	4	43.2	40W EE Fan	40	23.04	20.16	178	1700	10200	57
17	Zoology Lab	3	75	Ceiling Fan	2	10.8	40W EE Fan	40	5.76	5.04	44	1700	5100	115
18	Physics Lab	5	75	Ceiling Fan	2	18	40W EE Fan	40	9.6	8.4	74	1700	8500	115
19	Block No. 9 & 10	6	75	Ceiling Fan	2	21.6	40W EE Fan	40	11.52	10.08	89	1700	10200	115
20	NSS Office	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
21	Second Floor	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
22	Commerce Dept	4	75	Ceiling Fan	2	14.4	40W EE Fan	40	7.68	6.72	59	1700	6800	115
23	Exam Section	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
24	Staff Room	3	75	Ceiling Fan	3	16.2	40W EE Fan	40	8.64	7.56	67	1700	5100	77
25	English Dept.	4	75	Ceiling Fan	2	14.4	40W EE Fan	40	7.68	6.72	59	1700	6800	115
26	Block No. 1 & 2	4	75	Ceiling Fan	2	14.4	40W EE Fan	40	7.68	6.72	59	1700	6800	115
27	Block No. 3	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115

Sr. No	Location	Qty	Wattage	Fan Type	Op Hr	Mthly kWh	Change	New Wattage	New kWh	Saving kWh	Saving (Rs)	Unit Price (Rs)	Investment (Rs)	Payback (Months)
28	Third Floor Passage	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
29	Block No. 4	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
30	Block No. 5	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
31	Block No. 06	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
32	Block No. 7 & 8	4	75	Ceiling Fan	2	14.4	40W EE Fan	40	7.68	6.72	59	1700	6800	115
33	Tower	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
34	Security Dept.	2	75	Ceiling Fan	4	14.4	40W EE Fan	40	7.68	6.72	59	1700	3400	57
35	Gymkhana	4	75	Ceiling Fan	4	28.8	40W EE Fan	40	15.36	13.44	118	1700	6800	57
36	Women Emp. Cell	2	75	Ceiling Fan	2	7.2	40W EE Fan	40	3.84	3.36	30	1700	3400	115
37	Toilet	0	75	Ceiling Fan	0	0	40W EE Fan	40	0	0	0	1700	0	#DIV/0!
Total		105				511.2			272	238	2102		178500	85

- Total number of fans in the campus =105 Nos.
- Total number of fans used in the campus (considering Usage factor) = 105 Nos.
- Number of fans to be replace = 105 Nos.
- The Total Current Consumption =511.2 kWh
- The Expected fan Consumption =272.64 kWh
- Total KWh saved per month = 238.56 kWh
- Total monthly cost savings = Rs.2564
- Investment = Rs. 178500
- Payback Period = 70 Months

7 Requirement of NAAC

7.1 Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources

= (Power requirement met by renewable energy sources / Total power requirement) X 100

= (0/1095) X 100

= **0%**

7.2 Percentage of lighting power requirement met through LED bulbs

Percentage of lighting power requirement met through LED bulbs

= (Lighting power requirement met through LED bulbs / Total lighting power requirement) X 100

= (136/136) X 100

= **100%**

8 Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon-Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented.

Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade a, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

8.1 Goals of Green Audit

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of
- To avoid the interruptions in environment that are more difficult to handle and their correction requires high cost.
- To suggest the best protocols for adding to sustainable development

8.2 Benefits of Green Audit

- It would help to shield the environment
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- It portrays a good image of a company which helps building better relationships with the group of stakeholders
- Enhance the alertness for environmental guidelines and duties

9 Initiatives by College towards Sustainable Environment

9.1 Plantation of Medicinally important Plant in Botanical Garden



Botanical Name: *Azadirachta indica* Juss.

Common Name : Neem, Kadunimba

Family: Meliaceae

Botanical Description:

Azadirachta indica, commonly known as **neem**, **nimtree** or **Indian lilac**, is a tree in the mahogany family *Meliaceae*. It is one of two species in the genus *Azadirachta*, and is native to the Indian subcontinent and most of the countries in Africa. It is typically grown in tropical and semi-tropical regions its fruits and seeds are the source of neem oil. Neem is a fast-growing tree that can reach a height of 15–20 metres (49–66 ft), and rarely 35–40 m (115–131 ft). It is deciduous, shedding many of its leaves during the dry winter months. The branches are wide and spreading. The fairly dense crown is roundish and may reach a diameter of 20–25 m (66–82 ft). The neem tree is very similar in appearance to its relative, Neem fruit, seeds, leaves, stems, and bark contain diverse phytochemicals, some of which were first discovered in azadirachta seed extracts, such as azadirachtin established in the 1960s as an insect antifeedant, growth disruptor, and insecticide the Chinaberry

Medicinal Uses:

- Products made from neem trees have been used in the traditional medicine of India for centuries, but there is insufficient clinical evidence to indicate any benefits of using neem for medicinal purposes.
- In adults, no specific doses have been established, and short-term use of neem appears to be safe, while long-term use may harm the kidneys or liver; in small children, neem oil is toxic and can lead to death.
- Neem may also cause miscarriages, infertility, and low blood sugar



Botanical Name: *Tinospora cordifolia* Miers.

Common Name: Gulvel, Guduchi or Giloy

Family: Menispermaceae

Botanical Description:

It is a large, deciduous, extensively-spreading, climbing shrub with several elongated twining branches. Leaves are simple, alternate, and exstipulate with long petioles up to 15 cm (6 in) long which are roundish and pulvinate, both at the base and apex with the basal one longer and twisted partially and half way around. It gets its name **heart-leaved moonseed** by its heart-shaped leaves and its reddish fruit. *Tinospora* contains diverse phytochemicals, including alkaloids, phytosterols, glycosides, and mixed other chemical compounds. Columbine, tinosporaside, jatrorrhizine, palmatine, berberine, tembeterine, tinocordifolioside, phenylpropene disaccharides, choline, tinospora acid, tinospora, tinosporin, and tinosporide have been isolated from *Tinospora cordifolia*.

Medicinal Uses:

- In Ayurveda, *Tinospora* has been used over centuries to treat various diseases.
- There is plenty of scientific evidence that it has many anti-disease effects, and is not approved by any regulatory agency as a prescription drug.
- Many cases of hepatic damage were reported as a result of consuming tinospora cordifolia as an "immunity booster" during the covid-19 pandemic.



Botanical Name: *Adhatoda vasica* Nees.

Common Name : Adulsa, Adhatoda

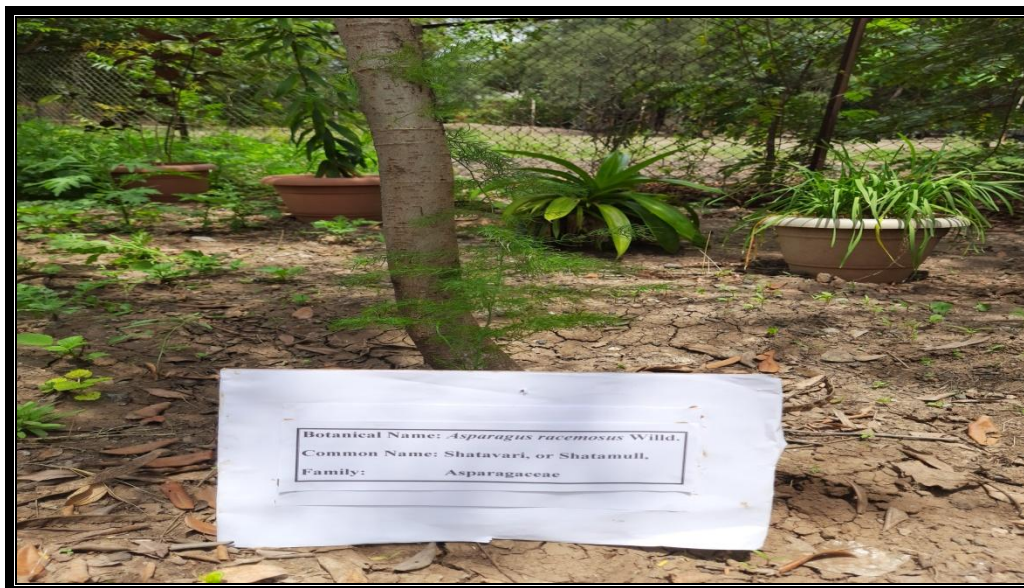
Family: Acanthaceae

Botanical Description:

Adhatoda vasica is a small evergreen plant, of the Acanthaceae family, with broad, lanceolate (sharp and pointed like a lance) leaves measuring 10 to 16 centimeters in length and 5 centimeters wide. They become greenish-brown when dried and have a bitter taste. They have a smell similar to strong tea. The wood of the stem is soft, and makes a great charcoal for gunpowder. The flower has large, attractive, white petals, streaked with purple

Medicinal Uses:

- Principle constituents of Malabar nuts are the several alkaloids present and chief principle being quinazoline alkaloid, vasicine. The leaves are rich in vitamin C and carotene and yield an essential oil. The shrub is the source of the drug, well known in indigenous systems of medicine for its beneficial effects, particularly in bronchitis. The leaves, flowers, fruits and roots are extensively used for treating cold, cough, whooping-cough, chronic bronchitis and asthma. It acts as a sedative-expectorant, antispasmodic and anthelmintic. It is a bronchial antiseptic, bronchodilator and expectorant.
- The roots, leaves and flowers and active principles of the plant possess a number of pharmacological properties and are used in cough, chronic bronchitis, rheumatism, asthma and bronchial asthma.



Botanical Name: *Asparagus racemosus* Willd.

Common Name: Satavar, Shatavari, or Shatamull, Shatawari

Family: Asparagaceae

Botanical Description:

It grows 1–2 m (3 ft 3 in–6 ft 7 in) tall and prefers to take root in gravelly, rocky soils high up in piedmont plains, at 1,300–1,400 m (4,300–4,600 ft) elevation. It was botanically described in 1799. Because of its multiple uses, the demand for *Asparagus racemosus* is constantly on the rise. Due to destructive harvesting, combined with habitat destruction, and deforestation, the plant is now considered "endangered" in its natural habitat. *Asparagus racemosus* is a climber having stems up to 4 m long. Its roots are both fibrous and tuberous.

Medicinal Uses:

- Shatavari is important in traditional Ayurvedic medicine.
- Extracts made from dried roots are used for various reproductive and hormonal issues in women.
- It is also used in cases of gastric ulcers and indigestion.
- Despite its long history of use in Ayurveda, few studies exist to support health effects of shatavari.
- Studies of its effects on lactation have shown mixed results. Its safety has not been well studied, however small trials have found no adverse effects in mothers or their babies.
- The key pharmacologic constituents of shatavari are steroidal saponins, mucilage, and alkaloids.



Botanical Name: *Rauvolfia serpentina* (L.) Benth. ex Kurz.

Common Name : Sarpagandha, Harkaya: Harki Rauvolfia root,

Family: Apocynaceae

Botanical Description:

Rauvolfia serpentina, the **Indian snakeroot, devil pepper, or serpentine wood**, is a species of flower in the milkweed family Apocynaceae. It is native to the Indian subcontinent and East Asia (from India to Indonesia). *Rauvolfia serpentina* contains dozens of alkaloids of the indole alkaloid family, including ajmaline, ajmalicine, reserpine, and serpentine, among others.

Medicinal Uses:

- According to Ayurveda root is bitter, acrid, heating, sharp, pungent and anthelmintic.
- Drug Rauvolfia consists of air-dried roots.
- Rauvolfia preparations are used as antihypertensive and as sedative.
- It is also used for the treatment of various central nervous system disorders associated with psychosis, schizophrenia, insanity, insomnia, and epilepsy.



Botanical Name: *Alstonia scholaris* (L.) R.Br.

Common Name : Saptaparni, Devil's Tree, Scholar

Family: **Apocynaceae**

Botanical Description:

Tall evergreen tree up to 18 m with bitter milky juice, glabrous except inflorescence. Bark grey rough and yellowish from inside, branches whorled, young branches lenticellate, when the bark is injured a milky juice comes out. 4 - 7 in whorls, coriaceous, oblong - lanceolate, obtuse or bluntly acuminate, dark green above, pale and covered with whitish bloom beneath, base tapering, main nerves numerous, nearly horizontal, parallel, uniting in an intramarginal nerve. Capitulate cymes. Small, fragrant, greenish white, in umbellate, branched many - flowered, pubescent capitulate cyme, peduncles 2.5 - 5 cm long, pedicels very short, bracts oblong, pubescent. Calyx 0.3 cm, lobes oblong, obtuse, ciliate. Corolla tube 0.8 cm long, villous inside, mouth with ring of hairs, lobes cuneate oblong, rounded or sub-truncate at the apex, pubescent. Carpels pubescent. Follicles 30 - 60 cm long and 0.3 cm in diameter, cylindrical, pendulous in clusters, become completely averted after dehiscence. 0.6 cm long, linear - oblong, flat, round with fringe of hairs at both ends.

Medicinal Uses:

- The tree is often planted as an avenue plant and as ornamental in gardens.
- The bark is used for treating asthma and heart ailments, fever and diarrhoea.
- The bark is used to make writing pens - 'dita'.
- The fruits are bitter in taste and are used as medicine against intestinal worms.



Photograph: Plantation of Some Medicinally important Plant in Botanical Garden by the Dept. of Botany student in 2019-20

9.2 E- Waste Management Program

- a) ASC College , Kolhar is digitalized to some extent.
- b) The institute has 42 PCs, 07 Printers,1 Air conditioners in working condition.
- c) The generation of E-waste is also small.
- d) All E-waste is collected and stored in respected department and once in five year this E-waste is collected from respective department and given to authorize recycler.
- e) The data on E-waste generation and its disposal is not available.
- F) There is no documented policy for collection , segregation of e-waste .

9.3 Initiative Taken to Avoid Use of Paper / Plastic, Etc. In College Campus

Being academic intuition , waste paper is the main solid waste waste generation in the premises . The institution has taken steps to minimize and avoid paper usage .It was observed that:

- a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalization (scanning) is practiced.
- b) The college E-Library facilities with INFLIBNET N-List and DELNET Consortia.
- c) The library is fully automated with bar-coded books.
- d) There are 6000+ E-journals and 3135000+ E-books in library.
- e) Faculty and administration staff use old papers and envelop for internal usages as rough work , file markers , page separators etc.
- f) Paper notices are displayed on the notice boards.
- g) The dissertation reports, journals, and answer papers are stored as per the University rules. Most answer papers will be archived and stored in a record room at ground floor. Old publications are still stored in the library.
- h) As per the memo, for the disposal of old newspaper scrap dealer is called by librarian.

9.4 Rain Water Harvesting

Rain water which is accumulated on terrace of different building is getting utilised by means of rain water harvesting system. Water from the various buildings is transferred to the one big chamber. 78000 This water is used to recharge the ground water

Following are the same images of actual system

