Green Audit Report

(2021-22)

Panchakshari Shivacharya Trust

Channabasweshwar Pharmacy College (Degree)

Basweshwar Chowk, Maharashtra Latur 413512 (Maharashtra)

Green Audit report Submitted by

KEDAR KHAMITKAR & ASSOCIATES

Energy Auditor Empanelled Mahaurja, Govt. of Maharashtra

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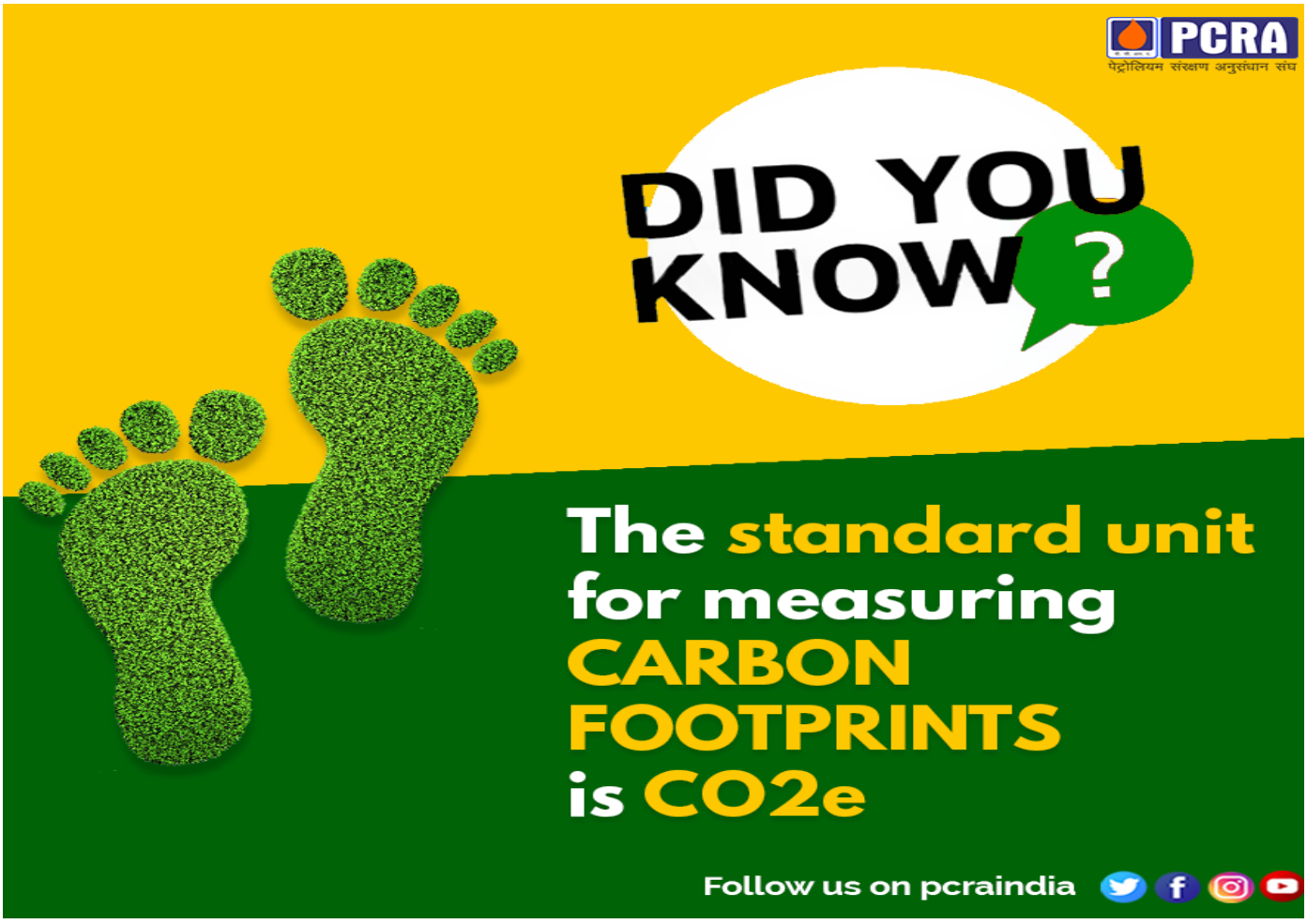


Acknoledgement :

We express our sincere gratitude to the Principal Sir & Management of Channabasweshwar Pharmacy College (Degree), Latur for awarding us the assignment of Green Audit of their Latur Campus.
We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

Kedar Khamitkar
Energy Auditor
Certified by Bureau of Energy Efficiency, Ministry of Power, Gov. of India
Empanelled Consultant MAHAURJA (Govt. of Maharashtra Institution

EXECUTIVE SUMMARY:

Objective	Observation	Recommendation
Green Cover - Plantation of Trees	Green cover is extended every year in the campus. At Present 15% area campus is having the Green cover.	It is recommended to increase the Green Cover Further.
Use of Renewable Energy	Institute is planning to install Roof - top Solar Power Plant.	Found maximum use of Natural Day Light in the Campus.
Water Conservation	Recommended to Install Sign Boards. Awareness for Water Conservation.	Install Sewage Water Treatment Plant.
Rain Water harvesting	Rainwater Harvesting has been installed.	Conduct Training Program
Bio Waste Management	The Bio Waste – Food Waste generated in the campus is proposed to be feed stock for Bio Gas plant	Install Bio gas Plant.
Non Bio Waste	Non Bio Waste – Plastic Bottles / Paper Waste Metals waste is being collected in the dust bins placed across the campus.	
E Waste	E Waste – All Electronic Junk is generated in the campus in the form of Used Computer key boards/ Mouse/ CPU's/ Damaged Printers etc.	An agreement is in place with local Company to pick up the E waste every six month
Carbon Foot Print	Mostly staff commute in the Mahanagar Palika Buses -	Found Awareness in the Staff

Chapter No.1 Scope of Work & Green Audit Methodology

Channabasweshwar Pharmacy College (Degree) , Latur entrusted the work of conducting a detailed Green Audit of campus with the main objectives are as bellows:

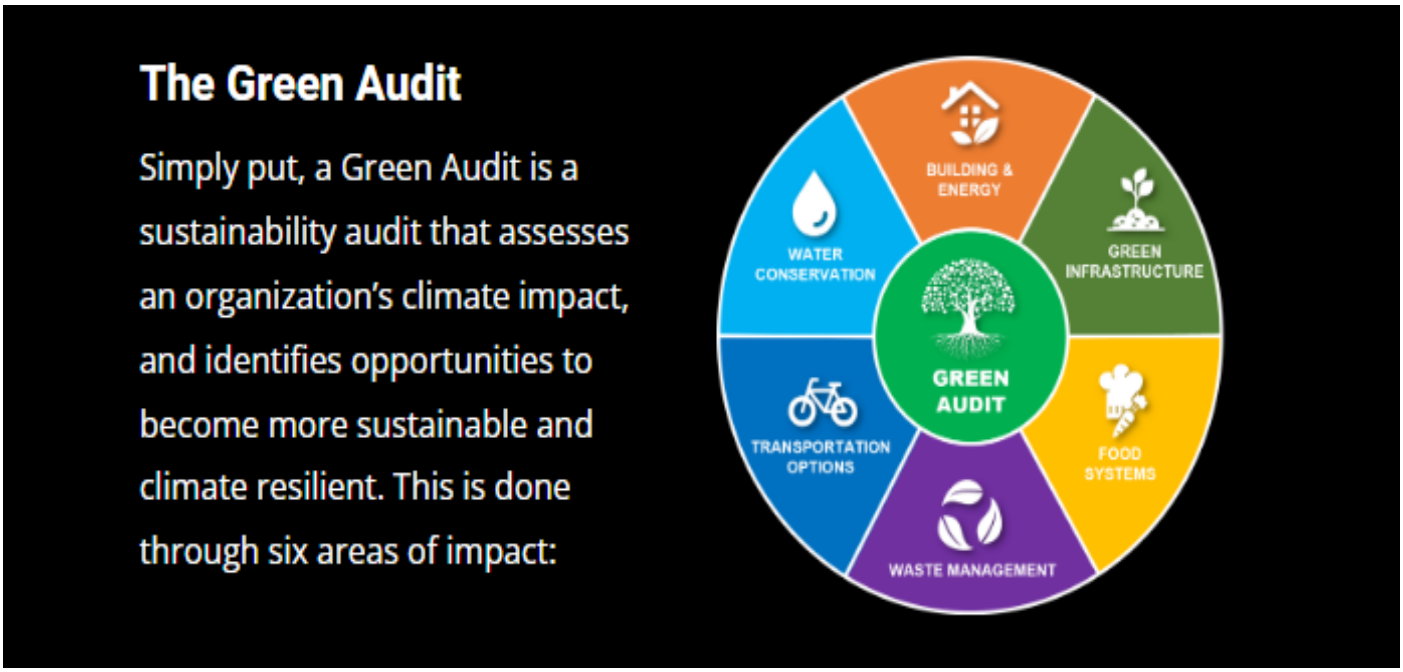
Objectives of Green Audit:

1. To examine the current practices, which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision, and mission for Green practices in campus.
4. Establish and implement Environment Management in various departments.
5. Continuous assessment for betterment in performance in green

Need of Green Audit:

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

Goals of Green Audit:



Conducted a green audit of Channabasweshwar Pharmacy College(Degree), Latur Campus with above mentioned specific goals

To check the green practices followed by college and to conduct a well-defined audit report to understand whether the college is on the track of sustainable development.

Chapter No.2 **Introduction about the Institute**

Panchakshari Shivacharya Trust, Channabasweshwar Pharmacy College (Degree), Latur was established in the year 2010. "Panchakshari Shivacharya Trust" is a charitable trust registered under Bombay act 1950. It undertakes educational and social activities. This trust has started Channabashweshwar pharmacy polytechnic in Latur in 1980. After realizing the prospects and potential of the course in the emerging scenario of global pharmaceutical industry and education, Channabasweshwar Pharmacy College (Degree) was started in 2010, Bachelor of Pharmacy. Thereafter postgraduate course in 2012 M. Pharmacy (Pharmaceutics and Pharmaceutical Quality Assurance). Since 2019 the College has recognized as Approved Ph. D Research Centre. Thereafter the Pharm D course in 2020 and other PG branches like Pharmaceutical Quality Assurance and Pharmacology in 2021. College is having its own well structured building, well equipped laboratories, and library with number of reference books, international journals with e-library, good computing facility and research laboratory. The College is promoting green initiatives to make positive environment within the campus.

Sr. No.	Head	Particular
1	Name	**Channabasweshwar Pharmacy College (Degree)**
2	Address	**Basweshwar Chowk, Kava Road, Latur (M.S.)**
3	Course Offered	**B. Pharm. & M. Pharm.**

Address: Kava Road, Latur 413531 (Maharashtra)

ARIAL VIEW OF COLLEGE CAMPUS (SOURCE GOOGLE EARTH)

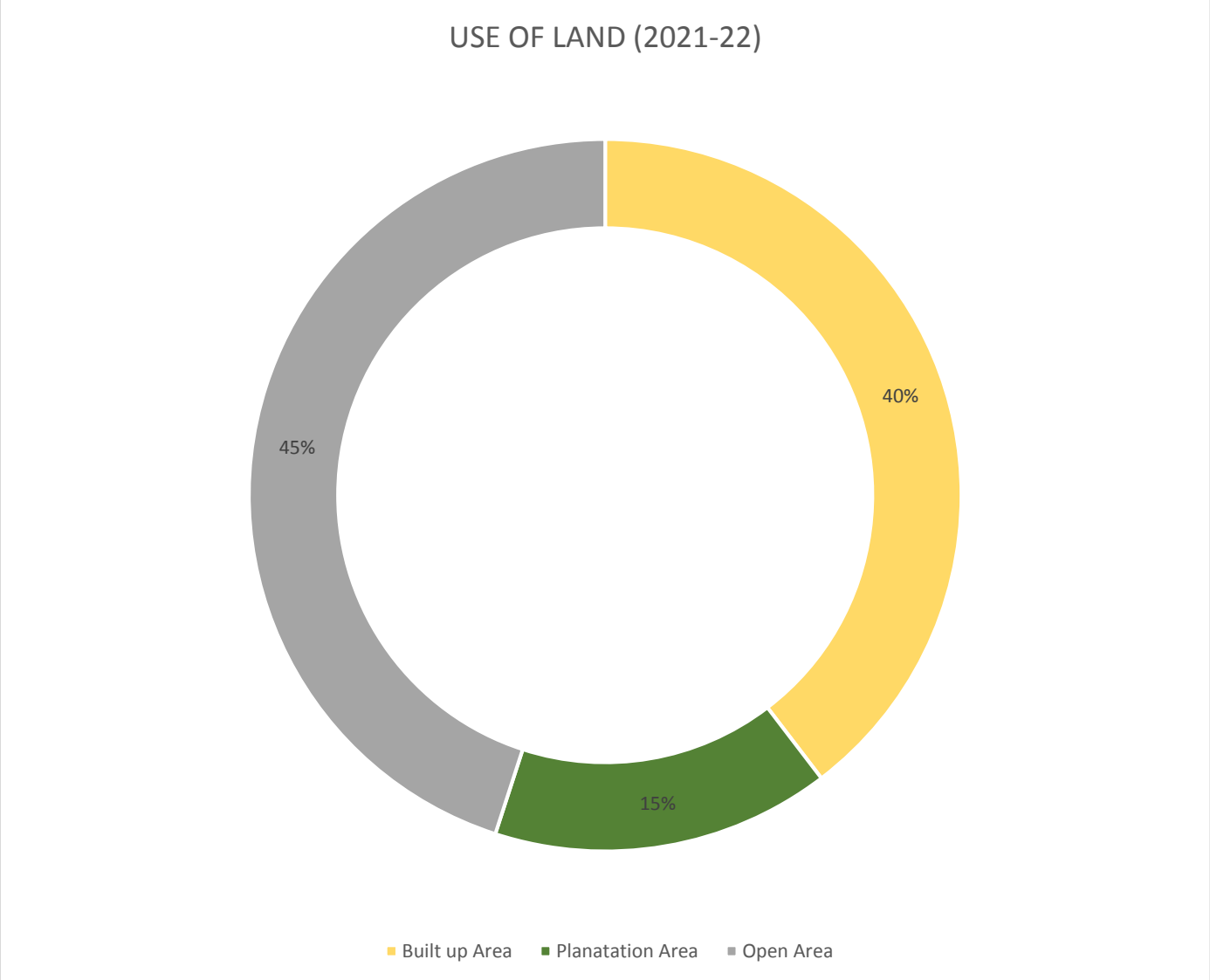
Location: The College is situated at kava road, in most beautiful and spacious campus, 50 meters away from Basweshwar Chowk, 1.0 km from bus stand and 5.0 km from railway station.

Chapter No.3 **CATEGORIES OF LAND USE**

Plantation of trees is started in the campus and the green cover is extended every year in the campus. At Present **15%** area campus is having the Green cover.

Audit Framework and detailed findings of the Audit:

Built up Area	3625	SQM
Plantation Area	1406.86	SQM
Open Area	4118.14	SQM
Total	9150	SQM



Observations : Plantation area 15%

Chapter No. 4 Green Cover - Plantation of Trees

Observation – Total number of Plants in the Campus @110 Nos.

Sr.	Botanical Name	Family	Common Name	Total
1	Aloe barbadensis miller	Liliaceae	Aloe	01
2	Ocimum sanctum Linn	Lamiaceae	Tulsi	01
3	Asparagus racemosus	Liliaceae	Shatavari	01
4	Tinospora cordifolia	Menispermaceae	Gulvel	01
5	Santalum album	Santalaceae	Chandan	01
6	Prunus amygdalus	Rosaceae	Almond	01
7	Azadirachta indica	Meliaceae	Neem	05
8	Mangifera indica	Anacardiaceae	Mango	03
9	Emblica Officinalis	Euphorbiaceae	Amla	01
10	Momordica charantia	Cucurbitaceae	Karala	01
11	Eugenia jambolana	Myrtaceae	Jambul	01
12	Curcuma longa Linn	Zingiberaceae	Turmeric	01
13	Gymnema sylvestre	Asclepidaceae	Gymnema	01
14	Withania somnifera	Solanaceae	Ashwandha	01
15	Datura metal var	Solanaceae	Datura	08
16	Adhathoda vasica Nees	Acanthaceae	Vasaka	01
17	Catharanthus roseus	Apocyanaceae	Vinca	04
18	Capsicum annuum	Solanaceae	Capsicum	01
19	Foeniculum vulgare Mill	Umbelliferae	Fennel	01
20	Coriandrum sativum	Umbelliferae	Coriander	01
21	Eugenia caryophyllus	Myrtaceae	Clove	01
22	Eucalyptus globulus	Myrtaceae	Nilgiri	01
23	Saraca INDICA	Leguminosae	Ashoka	05
24	Aegle marmelos	Rutaceae	Bael	01
25	Tamarindus indica	Leguminosae	Tamarind	02
26	Citrus lemonis	Rutaceae	Lemon	01
27	Allium sativum	Liliaceae	Garlic	01
28	Cocos nucifera	Palmae	Coconut	03

29	Brassica nigra	Cruciferae	Black Mustard	01
30	Solanum tuberosum	Solanaceae	Potato	01
31	Urginea indica	Liliaceae	Squill	01
32	Rosa sericea	Rosaceae	Rose	01
33	Cymbopogon citratus	Graminae	Lemon grass	01
34	Mentha spicata	Labitae	Spearmint	01
35	Hibiscus rosasinensis	Malvaceae	Chinarose	01
36	Terminalia catappa	Combretaceae	Badam	06
37	Ficus religiosa	Moraceae	Peepal	01
38	Ficus benghalensis	Moraceae	Wad	01
39	Annona reticulata	Annonaceae	Ramfal	01
40	Plumeria alba	Rauvolfioideae	Chafa	03
41	Nerium oleander	Apocynaceae	Kanheri	04
42	Pithecellobium dulce	Leguminosae	Manila Tamarind	02
43	Sesbania bispinosa	Fabaceae	Shevari	04
44	Calotropis gigantea	Apocynaceae	Ruchik	04
45	Ziziphus mauritiana,	Rhamnaceae	Bori	01
46	Jasminum sambac	Oleaceae	Mogara	01
47	Murraya koenigii	Rutaceae	Kadipatta	01
48	Syzygium cumini	Myrtaceae	Jambhul	01
49	Clitoria ternatea	Fabaceae	Gokarni	02
50	Ficus elastica	Moraceae	Rubber	01
51	Plumeria pidice	Apocynaceae	Nagchampa	17
52	Santalum alum	Santalaceae	Chandan	01
53	Moringa oleifera	Moringaceae	Shevga	01
Total number of plants				110

Chapter No. 5: Study of Waste Management

Environmental consciousness and sustainability friendly initiatives

Observations: Institute has been done Good Management of the various types of degradable and non-degradable waste

1. Solid waste management

- Solid waste is generated in the form of plastic, glass, metal, newspapers, lab manuals, etc. is stored at one place and scrapped periodically for recycling.
- Non degradable waste (Dry and wet) is collected separately empty bottles, cartons are collected regularly at one place and handed over to the municipal vehicle for collection and proper disposal.
- Use of paper printed on one side is encouraged for printing drafts before final document, meeting minutes, and institute level notices in office practices reducing paper based waste.

2. Liquid Waste Management

Liquid waste is generated in the form of solvents, solutions, reaction mixtures, preparations, etc. It is scientifically disposed as per waste management norms. The liquid waste generated during practical is disposed through well-constructed drainage system which is flushed with water from wash basins.

3. Biomedical waste management

Biomedical waste is generated in the form of animal experimentation, bioassays, micro biological cultures, fluid and blood at the institute. Waste like cotton gauze, bandage, textiles, syringes, needles, blades and lancets are disposed along with degradable waste. Sanitary incineration machine is available in the girl's common room for the management of sanitary pads.

4. E-waste management

The college is having facility to collect and disposed off periodically the e-waste from institutes, E-wastes such as old computers, printers, laptops, scanner, CD's etc. batteries are collected centrally. E-waste is given to authorized vendors for possible recycling. We have put the collection box in the institute, where e-waste is collected. Students are also made aware of E-waste issues and its safe disposal.

5. E. Hazardous chemicals and radioactive waste management

Hazardous chemicals like strong acids, strong alkalis and oxidizing agents are used in restricted and small quantities during practical's and research. Separate space is provided for storage of hazardous chemicals with highly visible sign. Chemicals are diluted sufficiently and then released into soak pits. Use of hazardous liquid chemicals generating hazardous fumes is carried out strictly in fuming cupboard to avoid spread of fumes.

6. Compost Prepared in College Campus

The leaves, all non-toxic and biodegradable waste, are collected and used to make compost through the microbial composting process, for which 4.36M x 1.31M x 1.13M pits was made in the campus. Vermicomposting is the process of turning organic debris into worm castings. The content of the earthworm castings, along with the natural tillage by the worms burrowing action, enhances the permeability of water in the soil. Worm castings can hold close to nine times their weight in water "Vermiconversion," or using earthworms to convert waste into soil additives.

7. Water Management

Institute has been taken good initiative for water conservation.

Water scarcity is serious problem throughout the world for both urban & rural community. Urbanization, industrial development & increase in agricultural field & production has resulted in overexploitation of groundwater & surface water resources and resultant deterioration in water quality. The conventional water sources namely well, river and reservoirs, etc. are inadequate to fulfill water demand due to unbalanced rainfall. While the rainwater harvesting system investigate a new water source.

Rainwater Harvesting System for Water Conservation:

Chapter No. 6 : Study of Carbon Foot printing

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities. The College Imports Electrical Energy during Night for various Electrical gadgets.

Basis for computation of CO2 Emissions:

The basis of Calculation for CO2 emissions due to Electrical Energy are as under

1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO2** into atmosphere

Based on the above Data we compute the CO2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Month wise Electricity Import details:

Month	Consumer No. 610557505868	Consumer No. 610550207241	Consumer No. 610550188492	KWH
April 2018	355	186	466	**1007**
May 2018	445	141	466	**1052**
June 2018	480	116	301	**897**
July 2018	485	140	300	**925**
August 2018	280	124	245	**649**
September 2018	230	117	389	**736**
October 2018	343	158	512	**1013**
November 2018	298	118	364	**780**
December 2018	290	104	341	**735**
January 2019	287	70	477	**834**
February 2019	238	94	234	**566**
March 2019	253	111	344	**708**

Observations: The College Imports Electrical Energy during Night for various Electrical gadgets. Annual Electricity Import = **9902** KWH/year

Calculations:

Electricity: **Input value (in KWh/Yr) X 0.85 (Emission Factor)**

= Output value in (Kg of CO_2)

Calculation for CO2 emissions due to Electrical Energy = 8416.7 Kg of CO_2 /year

Suggestions:

1. Reduce the Electricity Import during Night install Solar Streetlights.
2. Install Occupancy Sensors to minimize losses in Lighting System

Chapter No. 7 : Best Practices & Activities

Several significant and fruitful awareness programs both students and staff of the Campus are arranged every year in the campus. Reflections from students are Evident how effective such awareness programs conducted in the campus.

Environmental education through systematic environmental management approach.

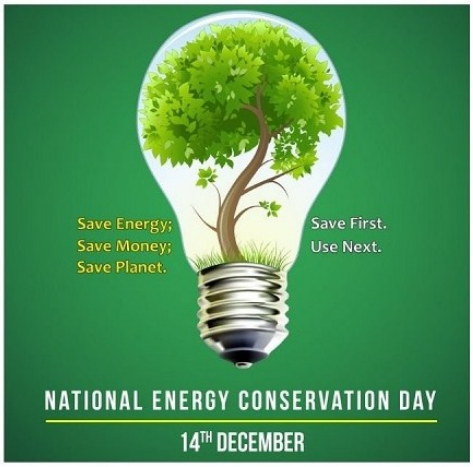
Conducted Institutional Training Program PCRA, Ministry of Petroleum & Natural Gas GOI

Resource Person : Kedar Khamitkar Energy Auditor

Faculty PCRA – Ministry of Petroleum & Natural Gas Government of India

Organized workshop on "Energy Conservation workshop" was organized by Channabasweshwar Pharmacy College (Degree), Latur on 14th December 2021 at 11:00 am. Guest speaker, Mr. Kedar Khamitkar, Energy Auditor, PCRA guided about the energy efficiency during this workshop. Mr. Khamitkar has given the message that by *saving energy* we have to help to save the world's *energy* resources. For this event Principal, Channabasweshwar Pharmacy College (Degree), Teaching, Non-teaching staff and students were prominently present.

National Energy Conservation Day



National Energy Conservation Day 2021

Campaigns: Nature camps, field trips and some of these activities are year round programs and others are regular year wiser semester wise or any other stipulated time bound programs.

Tree Plantation Campaign

Tree plantation was done at Channabasweshwar Pharmacy College (Degree), Latur On the occasion of World Environment Day.