

Green Audit Report
For
2019-2020
Prahladrai Dalmia Lions
College
Of Commerce and Economics,
Malad West, Mumbai

Report by – Dr.Rajashekhar O. Patil

M.A, LL.M, PGDBM, Ph.D.

Date of Audit: 02/01/2020 and 02/01/2020

Green Audit Report 2019-2020

Introduction:

In recent times, the Green Audit of an institution has become a paramount for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems.

Green audit can be a useful tool for an institute to examine how and where they are using the resources or most of the energy or water; the college can then improve and consider how to implement changes and make savings.

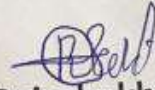
This report serves to highlight the accomplishments of Prahladrai Dalmia Lions College and to make recommendations for maintaining a sustainable environment in the college. The college conducted the Internal Green Audit in Academic Year 2019-2020 and strives to maintain eco-friendly atmosphere in the campus:

The activities taken by the college to make the campus eco-friendly:

- ❖ To create more awareness about environment the "Tree Plantation" was organized by college on 17th December 2019.
- ❖ In compliance with the recommendation given in Green Audit report of 2019-2020, The college has taken following initiatives:
 - E – Waste Box installation for disposal of Electronic waste items.
 - Sanitary Napkin Wending Machine has been installed in washrooms for Girl students.
 - Disaster is very common in each and every corner of the world. Regarding this U.N.O. has made some necessary recommendation for member countries. Government of India, Maharashtra State Government as well as BMC has their own regulations to reduce disasters. Prahladrai Dalmia Lions College has already taken measures in this direction. So college have "Disaster Management Cell/Aapat Bhandhav" it creates more awareness among the students community.

Suggestion/Recommendations:

- ❖ Form a "Nature Club", which is based on United Nations Environmental Program (UNEP). UNEP is at Global Level whereas your Nature Club will be at local Level.
- ❖ College should take initiative in "Seeds Bombing" in the nearby Green Zone Area/Forest Areas as a part of Monsoon Activities.
- ❖ To set up rain water harvest plant.



Dr. Rajashekhar O. Patil

M.A, LL.M, PGDBM, Ph.D.

(Auditor)

Place: Mumbai

Date: 03/01/2020

Green Audit Report (2021-22)



Prahladrai Dalmia Lions College of Commerce & Economics

Sunder Nagar, S. V. ROAD, Malad (West), Mumbai – 400064



Green Audit report Submitted by



Kedar Khamitkar & Associates

Energy Auditor

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FIVE WAYS TO CONTROL CLIMATE CHANGE



GREEN YOUR COMMUTE

Explore new options to commute and reduce your carbon footprint. Choose to walk, share car, ride bicycle, or electric vehicle.



CONSERVE FUEL

Stop the reckless of fuel and use it more sensibly. Conserving fuel reduces pollution for a cleaner and greener environment.



GET AN ENERGY AUDIT DONE

Get an energy audit done to determine the overuse of energy.



PLANT TREES

Plant trees and support reforestation. This way CO₂ level will be decreased, as trees use sunlight to absorb carbon dioxide from the atmosphere through photosynthesis and store it as carbon in the form of wood.



REDUCE, REUSE & RECYCLE

Reduce paper use, reuse whatever you can and recycle waste materials into a valuable resource. Be an environmentally conscious consumer.

Acknowledgement

We express our sincere gratitude to the Honorable Principal & Management of Prahladrai Dalmia Lions College of Commerce & Economics for awarding us the assignment of Green Audit of their Mumbai Campus.

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



Kedar

Kedar Khamitkar

Energy Auditor

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

प्रतिज्ञा

हम सत्यनिष्ठा से प्रतिज्ञा करते हैं कि अपने सभी कार्यों में पेट्रोलियम उत्पादों के संरक्षण हेतु सतत प्रयासरत रहेंगे, ताकि देश की प्रगति के लिए आवश्यक इन सीमित संसाधनों की आपूर्ति अधिक समय तक सम्भव हो सके। आदर्श नागरिक होने के नाते हम लोगों को पेट्रोलियम पदार्थों के व्यर्थ उपयोग से बचने तथा पर्यावरण संरक्षण हेतु स्वच्छ ईंधन का प्रयोग करने के लिए जागरूक करेंगे।

Objective	Observation	Recommendation
Green Cover - Plantation of Trees	Plantation of trees is started in the campus and the green cover is extended every year in the campus. At Present 28% 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 50 Kilowatt Roof top Solar Power Plant.	It is recommended to install EV charging station.
Water Conservation	Recommended to Install Sign Boards. "Save Water save Lives " Awareness for Water Conservation.	It is recommended to install taps with reduced water flow
Rain Water harvesting	Rainwater harvesting has been installed.	Good initiative for water conservation
Avoid Misuse/ wastage of water	RO water providing safe drinking water.	Waste water can used for Gardening.
	Encourage to reduce the water usage	Recommended for waste Water treatment plant
Bio Waste Management	The Bio Waste – Food Waste generated in the campus is proposed to be feed stock for Bio Gas plant	Recommended for 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.	It is proposed to install plastic bottle crusher, which can be sold as a Feed stock for the Plastic industry.
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 S.T. Buses	Found Awareness in the Staff
Transportation	Mostly Students commute in the ST Bus from City / rural Areas	Found Awareness in the Students

Executive Summary

Chapter No. I **Scope of Work & Green Audit Methodology**

Prahladrai Dalmia Lions College of Commerce & Economics entrusted the work of conducting a detailed Green Audit of campus with the main objectives are as bellows:

Objectives of Green Audit:

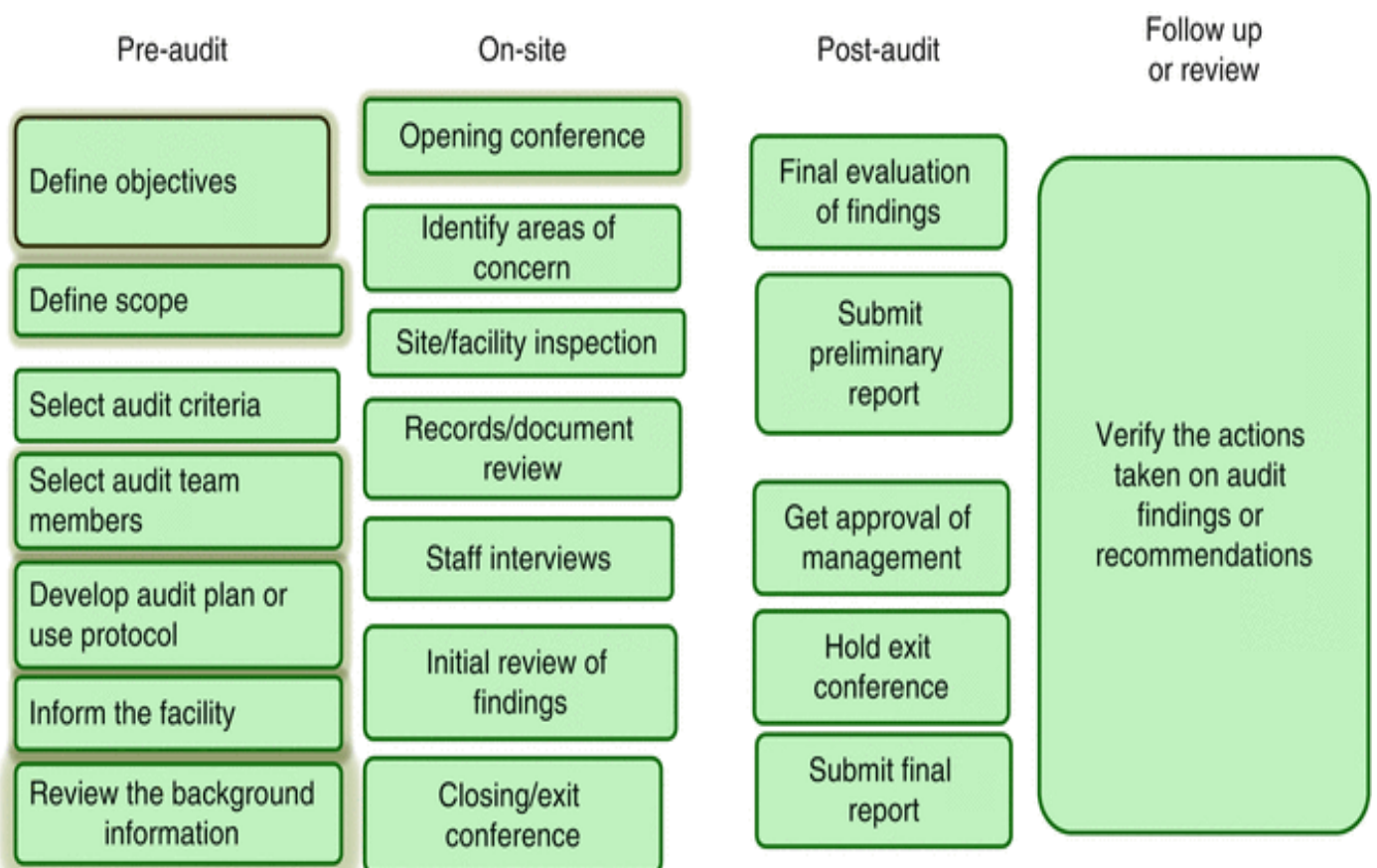
1. To examine the current practices, which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision, and mission for Green practices in campus.
4. Establish and implement Environment Management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

Methodology of Green Audit:

Green Audit conducted with specific methodology as follows:



Goals of Green Audit:

Conducted a green audit of Prahladrai Dalmia Lions College of Commerce & Economics Campus with specific goals as:

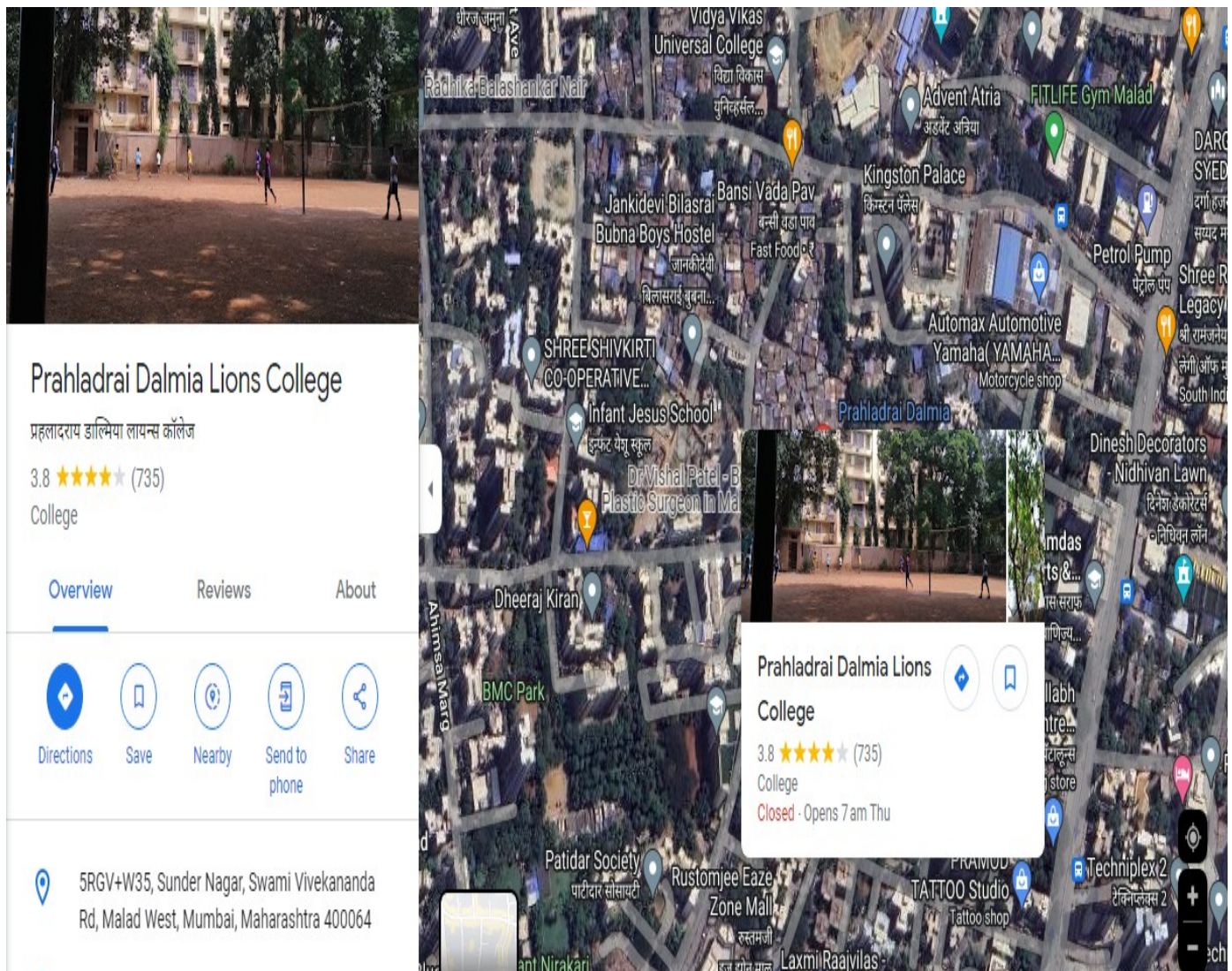
1. Identification and documentation of green practices followed by the Institute.
2. Identify strength and weakness in green practices.
3. Analyze and suggest solution for problems identified.
4. Assess facility of different types of waste management.
5. Increase environmental awareness throughout campus
6. Identify and assess environmental risk.
7. Motivates staff for optimized sustainable use of available resources.
8. The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental Issue before they become problem.



Chapter No.2 Introduction about the Institute

The Lions Club of Malad-Borivali, an international social organisation realized the necessity of establishing a Commerce College in the western suburb of Mumbai-Malad in 1972 to cater to the needs of the society. The vision envisaged by the stalwarts of the Club was finally converted into reality and the foundation stone of the college was laid in April, 1972, with a handsome donation from the Dalmia family of Prahladrai Dalmia Charity Trust. Within a record period of 100 days the college building was completed.

Sr.	Head	Particulars
1.	Name	Prahladrai Dalmia Lions College of Commerce & Economics
2.	Address	Sunder Nagar, S. V. ROAD, Malad
3.	Degree Courses	BMS; B.Com; BAMMC; BSc; BIM; M.com



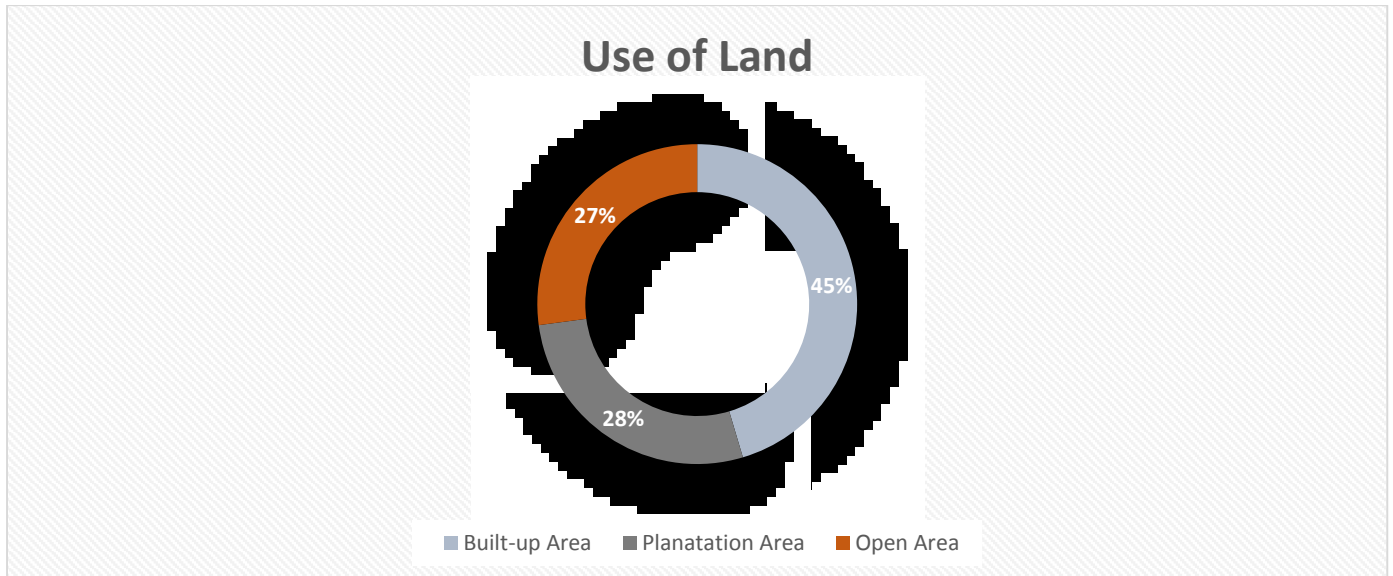
Prahladrai Dalmia Lions College of Commerce & Economics

AERIAL VIEW OF COLLEGE CAMPUS (SOURCE GOOGLE EARTH)

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.

Audit Framework and detailed findings of the Audit:

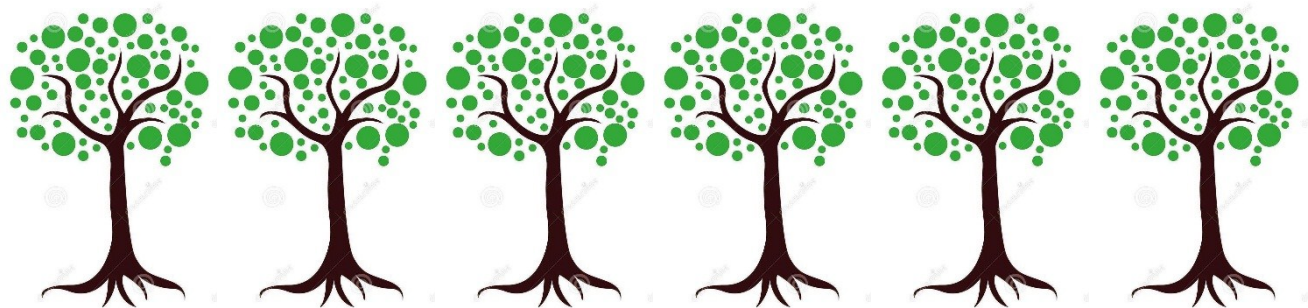


Observations At Present 28% area campus is having the Green cover.



Chapter No. 4 **Green Cover - Plantation of Trees**

Bio diversity Garden at Prahladrai Dalmia Lions College of Commerce & Economics. Institute have different type of trees. With the efforts of staff, faculty, and students who have planted on World Environment day in the campus.



List of Plants in:

Sr.	Common Name	Botanical Name	Total
1	Peepal	Ficus religiosa	3
2	Indian plum	Flacourrita indica	1
3	Tamarind	Tamarindus indica	4
4	Mango	Mangifera indica	8
5	Banyan	Ficus benghalensis	1
6	Neem	Azadirachta indica	2
7	Mahua	Madhuca longifolia	1
8	Badam	Prunus dulcis	3
9	Custard-Apple	Annona reticulata	1
10	Bindi	Abelmoschus esculentus	1
11	Lemon	Citrus limon	1
12	Jamun	Syzygium cumini	1
13	Ashoka	Saraca asoca	7
14	Coconut	Cocos nucifera	5
15	Moringa	Moringa oleifera	1
16	Vitis	Vitis vinifera	1
17	Ashwaganda	Withania somnifera	1

Biodiversity at Prahladrai Dalmia Lions College of Commerce & Economics



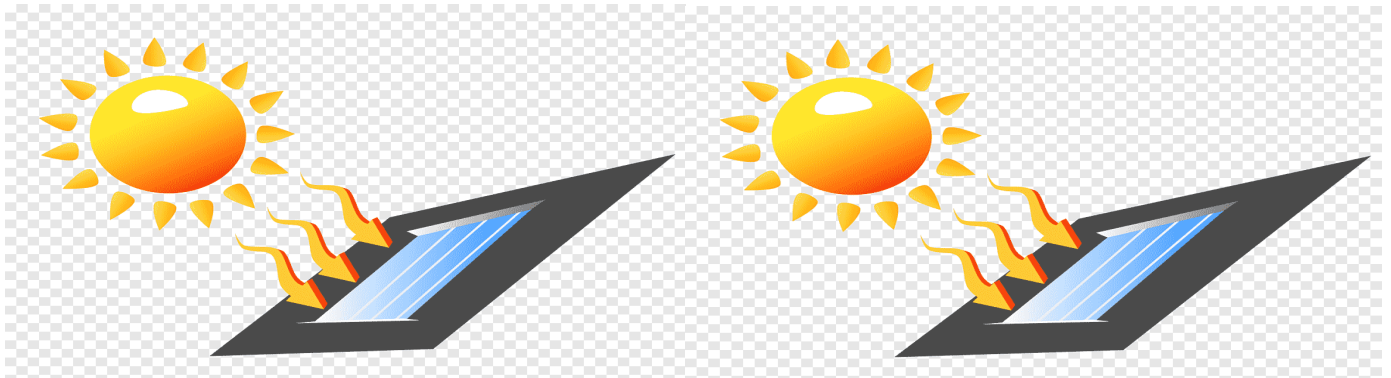
Chapter No. 5: Use of Clean & Green Energy

Institute is planning to install Rooftop Solar power plant of 50KW

Observations : I Annual Import Energy 75671 Units /year

Suggestions :

1. Install Occupancy Sensors to minimize electricity unknown losses.
2. Install Solar Street Lights to Minimize Electricity Import during Night.



Chapter No. 6: Study of Waste Management

Environmental consciousness and sustainability friendly initiatives

The internal communication of the College is through Internet within the staff members. There are hardly any Drives, CDs used for day to day operations. Hence as far as the e-waste is concerned hardly any waste is generated during the day to day operations. In addition to this the College authorities have already finalized Authorized e-Waste management agency to dispose of the old equipment.



Observations: Solid Waste management in the Campus

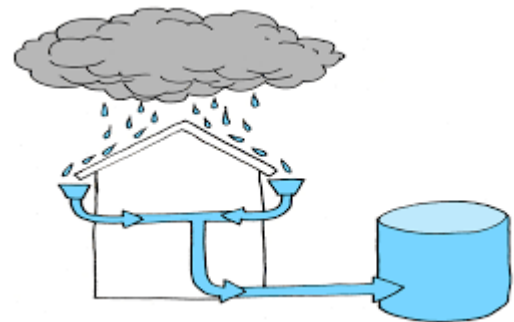
1. The college is taking care of cleanliness and hygiene every time. Daily garbage is collected and segregated into degradable and non-degradable waste by housekeeping personnel.
2. Plant leaves, all the non-toxic, biodegradable waste is collected and used for making compost through the Vermicomposting process for which pits having size 5.5 x 1.7 x 0.6 have been made in the campus.
3. Waste material like plastic, papers, glass, metal, newspapers etc. are collected and sold out to authorize scrap vendors for its recycling from time to time.
4. Non-degradable waste is collected separately. Institute has tied up with the local Municipal Committee for the disposal of non-degradable solid waste. This waste is collected in the vehicle and handed over to the Municipal Corporation garbage collecting unit.
5. College is adopting almost paperless concept by digitization of office procedures through tally ERP, examination work and daily attendance is maintained using software, thus, reducing paper-based waste.
6. One side printed papers are reused for printing drafts before final document, circulating notice, meeting minutes, and notes in office practices. This reduce paper usage and paper wastage.

Water Management :

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.

Rain Water Harvesting System

Rainwater harvesting is the simple process or technology used to conserve rainwater by collecting, storing, conveying and purifying of rainwater that runs off from rooftops, parks, roads, open grounds, etc. for later use.



Rain Water Harvesting system



Observations : Rain water Harvesting.

Institute has been installed Rainwater Harvesting. Good Initiative !

Chapter No. 7 : 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

Observations: The College Imports Electrical Energy for various Electrical gadgets.

Annual Import = 75671 KWH/year

Calculations:

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

= Output value in (Kg of CO₂)

= 64320.35 Kg of CO₂

Suggestions:

1. Reduce the Electricity Import during Day & Night install solar power plant of 50KW Capacity.
2. Install Occupancy Sensors to minimize losses in Lighting System.



DID YOU KNOW?

The standard unit for measuring **CARBON FOOTPRINTS** is **CO₂e**

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Chapter No. 8 : 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. Major programs conducted in the campus during the last Five years.

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.

5th June World Environment day Celebrations!



Tree Plantation Campaign Students & Staff participated in campaign.

Best Practices & Activities



Environmental education through systematic environmental management approach.



Training Program on E - Waste Management



Institute has Declared their Green Policy

Policy Document On Environment and Energy Usage

- To install LED bulbs in the complete campus to save energy
- To operate institute building in most efficient energy manner.
- Maximum use of Renewable Energy.
- Encourage a culture of Energy conservation on campus.
- To take additional measures to continuously improve our energy consumption.
- To develop and maintain Energy Management System based on ISO: 50001.
- To encourage use of advanced technology to minimize energy consumption.
- To engage in dialogue with the government agencies, and actively work with the local organizations in the areas of environment, energy efficiency and sustainable development.
- To strengthen our employees' and students' environmental knowledge and skills in order to improve our own environmental performance.
- To provide information and training opportunities on energy saving measures.
- To train our employees and students through our Enviro Club to make them 'Go Green Specialists' and partners to plant trees each year.

(Signature)

Principal





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Green Audit Report



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<u>Site Description</u>	
Building Name	: <u>Prahladrai Dalmia Lions College of Commerce & Economics.</u>
Address	: <u>Sunder Nagar, S.V Road, Malad West, Mumbai, Maharashtra 400064.</u>
City	: <u>Mumbai</u>
State	: <u>Maharashtra</u>
Pin code	: <u>400064</u>
Building Type	: <u>Educational Institute</u>
No. of Units	: <u>1 Nos</u>
No. of Floors	: <u>Nos</u>
No. of Parking Floors	: <u>0 Nos</u>
Age of Structure	: <u>51 years (Approximately)</u>
No. of Employees (Teaching and Non-teaching staff)	: <u>141 Nos (Approximately)</u>
No. of students	: <u>7284 Nos (Approximately)</u>
No. of Lifts	: <u>1 Nos</u>
Contact Person	: <u>Dr. Kiran Mane</u>
Position	: <u>Principal</u>
Contact Email	: <u>principal@dalmialionscollege.ac.in</u>
Contact Number	: <u></u>
No. of Connections	: <u></u>



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Prahladrai Dalmia Lions College of Commerce & Economics - Educational Institute

Electricity Consumption

The institute has several elements that are completely dependent on electrical energy for operations.

It is observed from the bills that:

Electricity	Consumption (units)	Emissions (tons of CO ₂ e)
Daily	162.115	0.314
Monthly	4931	9.426
Yearly	59172	114.69

Based on the consumption in 2022, it was observed that there is an average fluctuation of approximately 27%. This fluctuation can be the result of **work demand**.

The facility has several types of instruments, equipment, devices and items that includes light fittings, fans, air conditioners, lifts, computer projectors, cameras etc. and items that induce *inductive or capacitive load*. This has a direct impact on the efficiency at which the power is being consumed at the Institute. (In simpler terms, use of such devices has a direct contribution towards the power factor of the facility.)

Based on the bills provided for the months from Oct 2022 to November 2022, it can be observed that the average power factor for the institute was 0.8889. the month of February has observed the lowest Average Power Factor of 0.8678 for the institute.



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Fugitive Emission

Air Conditioners are found on each floor in the specific rooms. Fugitive emissions are introduced due to the leaked refrigerant from the air conditioning system/refrigeration system. The Air conditioning systems were operated throughout the working hours of the college. Refrigerant R-32 was used in each of the air conditioners. The Average Fugitive Fluctuation over is 10%

Fugitive Emissions	Emissions (tons of CO ₂ e)
Daily	0.006
Monthly	0.198
Yearly	2.42

Commute

Commute of a total of 7,425 people was considered which included the students, faculty, and the non-teaching staff of the institute. Public transportation such as local trains for long distance travel and buses for short distance travel were considered.

Emissions due to Commute	Emissions (tons of CO ₂ e)
Daily	1.188
Monthly	35.65
Yearly	433.78



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Water

Based on the Average Consumption of water based on the Water bills Provided of the Year 2022.

Emissions due to Commute	Emissions (tons of CO2e)
Daily	3.00
Monthly	90.15
Yearly	1096.87

Waste

On the Approximated Calculation done on the waste generation at the Premises Of both Wet and Dry waste.

Emissions due to Commute	Emissions (tons of CO2e)
Daily	0.902
Monthly	27.07
Yearly	329.4



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Total emissions

Considering all the parameters mentioned earlier, the total emissions generated due to the institute was determined.

Total Emissions	Emissions (tons of CO₂e)
Daily	5.416
Monthly	162.50
Yearly	1977.16

Remarks

There is a 20% error margin due to the lack of verification of the data collected by the volunteers.



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Recommendations

Based on the audit conducted, there is a scope of reduction and offsetting the emissions generated within the organizational boundary of the institute.

- Plantations: Planting 8000 trees per year for the next 5 years would make a major contribution in offsetting the emissions generated.
- Energy Audit: Targeted audit can help achieve up to 10-15 % savings on electrical consumption by recommending changes or upgrades to the existing systems in place.
- Solar Installation: Setting up at least 20kW of solar power plant will not only reduce energy consumption from conventional grids but also yield monetary savings.
- Water conservation: Reuse of grey water should be considered wherever possible. Rainwater harvesting with immediate use of water and not from borewells, will
- Waste Management: Design policies for on-site waste management in the organization. For off-site wet and dry waste management partner with registered organizations
- Shared buses: Set up shared buses for commute up to the railway station as most of the students take local trains.

