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# Green Audit (2021-22)

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## Introduction

### a. Green Audit:

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. The purpose of green auditing is to assess periodically the compliance of completed or on-going activities with the requirements of legislation, measures proposed in environmental policies, environmental management systems and environmental schemes or the provisions of standards and contracts.

### b. Benefits of Green Audit:

1. Ensuring legislative compliance. Reducing environmental impacts.
2. Reducing waste, water and energy costs.
3. To safeguard the environment and natural resources.
4. Empower the organization to frame a better environmental performance.
5. It portrays good image of institution through its clean and green campus.

Finally, it will help to built positive impression for the upcoming NAAC visit.

### c. NAAC criteria VII Environmental Consciousness:

Green Audit is assigned to the criterion VII of NAAC. National Assessment and Accreditation

Council which is a self-governing organization that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation of the institution. The intention of green audit is to upgrade the environmental condition in and around the institution. It is performed by considering some environmental parameters like water and wastewater management, energy conservation, waste management, air monitoring, etc. for making the institution more eco-friendly.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring nature in students. Many environmental activities like plantation and nurturing saplings and trees, cleanliness drives, bird watching camp, no vehicle day, rain water harvesting visits to ecologically important places through green clubs will make the student a good citizen of country

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## College Photo from Road



**Rajasthani Sammelan’s Ladhidevi Ramdhar Maheshwari Night College of Commerce (LRMC)** was established in June 2014. It is an evening college for commerce with more than 1100 students. The institution provides a 3-year Bachelor’s Degree in Commerce and a 2-year Master’s Degree in Commerce and is affiliated with the University of Mumbai. Along with evening university courses, the **evening college for B Com** also provides a platform to compete and showcase co-curricular talent. With its motto of “Enlightening Future,” this night college of commerce is educating India’s bright minds.

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Name of the Institute : **Rajasthani Sammelan's Ramdhar Ladhidevi Maheshwari Night college**

Establishment : June 2014

Pioneers : Rajasthani Sammelan's Education Trust

LRMC is conducting a 3 years course – “Bachelor of Commerce” and 2 years course - “Master of Commerce” affiliated to University of Mumbai. Approved by State Government of Maharashtra, since 2014. A Proper Care Is Taken to Provide Basic Amenities for The Students & The Staff Members. The Facilities are as Follows....

- **Classroom 13:** spacious classrooms with necessary furniture, Whiteboards & Projector in building of the college.
- **Library:** The Library of The College Is Centralized with More Than 3000 Books & 01 Reading Room.
- **Laboratory 1:** We are having spacious 2 laboratories with 176 Computers with Battery backup, Printer, Scanner, LCD projectors, equipment's & furniture etc.
- **Administrative Office:** The spacious LAN computerized administrative office with modern technology & with necessary facilities.
- **Toilet:** We have total 6 storage building on alternate floors we have Girls & Boys toilets.



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## Methodology

The college has conducted Green Audit in the year 2021-22, on a yearly basis. The audit was carried out in three phases.

### **a. Questionnaire survey:**

It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to Water and Wastewater management, Energy conservation, Green belt, Carbon inventory, Solid waste management, Hazardous waste management, Air and noise quality status, activities of nature club, etc. should be gathered for the audit purpose. For collecting data related to these different areas, specific questionnaires were prepared.

### **b. On-site visit and observations:**

The data related to above mentioned areas was collected by visiting each and every facility of college campus. The questionnaires were filled up according to the present situation. Photographic documentation was also done with the help of sophisticated camera.

### **c. Data analysis:**

After collection of secondary data, the reviews related to each environmental factor were taken by the green audit team. The data was tabulated, analyzed and graphs were prepared using computer. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. The Environmental Management Plan (EMP) was prepared for the next academic year in order to have better environmental sensitization. Finally, all the information was compiled in the form of Green Audit Report.

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**Environmental Auditing  
Process**



**Plannin  
g**



**Choosing Audit  
Team**



**Collection of  
Data**



**Analyzing Results of  
Audit**



**Evaluating  
Audit**

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## **b. Water and Wastewater Audit:**

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. A water audit is a technique or method which makes possible to identify ways of conserving water by determining any inefficiencies in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

Water accounting is the process of communicating water resources related information and the services generated from consumptive use in a geographical domain, such as a river basin, a country or a land use class; to users such as policy makers, water authorities, managers, etc.

### Importance of Water Audit:

- Water audit improves the knowledge and documentation of the distribution system.
- Identifies the problem and risk areas and a better understanding of what is happening to the water after it leaves the source point.
- Leads to reduced water losses.
- Improved financial performance.
- Improved reliability of supply system.
- Efficient use of existing supplies.
- Better safeguard to public health and property and reduced legal liability. Reduced disruption, thereby improving level of service to customers.
- Large potential cost savings that can be achieved by water harvesting, through the recycling of water and the use of rain water.

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It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology determine the requirement of water. The community which has a population between 20,000 to 100,000 requires 100 to 150 liters per person (capita) per day. As per the standards provided by WHO Regional office for South East Asia colleges requires 2 liters per student; 10-15 liters per student if water-flushed toilets.

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**i) Water Audit:**

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in residential girls hostel academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall waters used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system.

**Water Audit Process:**



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## ii) Overall water consumption in the RSET Campus

From the data collected for water audit of Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce SV road Malad (w) Mumbai the water distribution and water consumption pattern is noticed as follow. The college is having main building for administrative work as well for teaching work. For the water audit purpose we categorized the college campus area

In water audit study the daily water consumption is found to be as follows.

### Daily water consumption

		Daily water consumption by institute building							
							Water		
							Loss		
						Wash	During		
Site	Toilet		Kitchen	Garden	Drinking	Basin	Filling	Total	
Total use of									
Water									
(liters/day)	867		45	265	225	78	20	1500	
Percentage	32.34		3	20	15	1.4		100	
					5				

The total water consumption per day for all buildings is found to be 1500 lit/day

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### **C. Total Electric Energy Audit:**

An electricity audit is simply an audit or calculation of how much electricity you are using in your home and of where that electricity is going.

An energy audit is an analysis of a facility, indicating how and where that facility can reduce energy consumption and save energy costs. Its insight to energy efficiency and conservation can lead to significant savings on the company's utility.

#### Importance of Electric energy Audit:

- The audit will not only inform you of opportunities but provide you with financial analysis. This will enable prioritization based on financial benefit and return on investment.
- Provide you with solid, easy to understand technical information regarding the proposed energy conservation measures.
- A good quality audit will analyze your historical energy use and find potential issues using statistical methods.
- Provide you with emissions analysis to help you understand the benefits of your decisions from an environmental standpoint.
- Understand where energy is used and which areas are worth focusing on the most (energy hogs).
- Provide you with benchmark information to help you understand your energy use performance compared to others in your field and area.



### Electric energy Audit

Class Number	LED		Regular Light			Fan	Motor		Compute r
	12 watt	36 watt	20 watt	28 watt	36 watt	60 watt	1 HP	2 HP	60 watt
B.des 1	-	9	-	-	-	6	-	1	1
B.des 2	-	4	-	-	-	3	-	-	1
B.des 3	-	4	-	-	-	4	-	-	1
B.des 4	-	4	-	-	-	4	-	-	1
Staff Room	-	1	-	-	-	1	-	-	-
Library	4	-	-	-	-	1	-	-	1
Admin Office	-	2	3	-	4	6	-	-	30
Passage	-	2	-	-	-	2	-	-	-
Unit	<b>4</b>	<b>26</b>	<b>3</b>	-	<b>4</b>	<b>27</b>	-	<b>1</b>	<b>35</b>
Total Watts	<b>48</b>	<b>936</b>	<b>60</b>	-	<b>144</b>	<b>1620</b>	-	<b>1119</b>	<b>2100</b>
Total Units	LED Unit = 984 W							Regular Light Unit = 6027 W	

<b>Other Electric Equipment's</b>		
Names	Quantit y	Total
Printer 240 W	2	480
Projector 210 W	7	1470
Xerox 300 W	1	300

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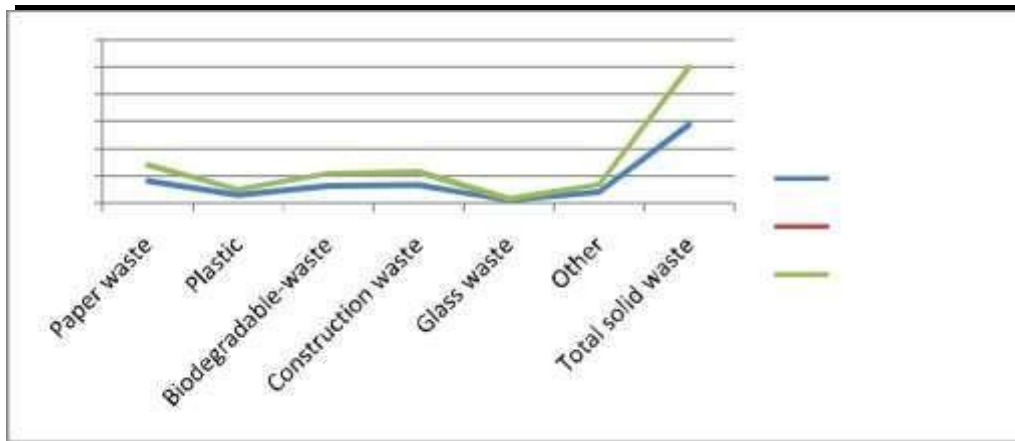
**d. Solid waste audit:**

Solid waste management is becoming a major public health and environmental concern world over. Improper solid waste disposal leads to substantial negative environmental impacts e.g., pollution of air, soil, water and generation of greenhouse gases from landfills. Many insect borne diseases are spread through garbage. Therefore, it is necessary to manage the solid waste appropriately to reduce the load on waste management system. The intention of this inventory is to find out the quantity, volume, type and current management practice of solid waste generation in Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce.

This survey related to solid waste generation would be helpful for making the college more environments friendly. Generation of solid waste in Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce are as follows:

**Category wise solid waste generation at Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce**

Category	Paper	Plastic	Biodegradable-	Construction	Glass	Other	Total
of waste	waste		Waste	Waste	waste		Solid
							Waste
Quantity kg/month	16.3	5.8	12.6	13.2	1.9	8.0	57.8
Percentage (%)	28.20	10.03	21.79	22.83	3.28	13.84	100

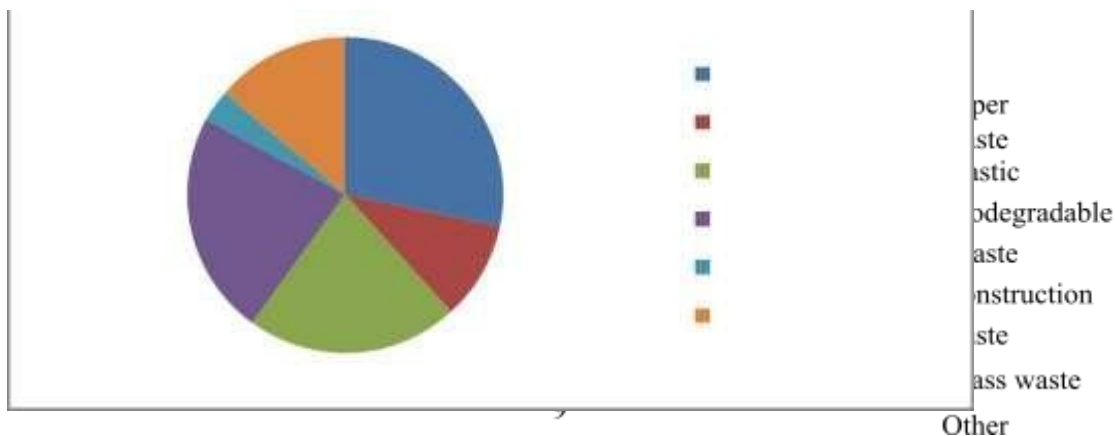


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Category wise solid waste generation at Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce

The average amount of solid waste generated per month in Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce was 57.8 kg/month. On the basis of observations the highest quantity of solid waste generated is paper waste which is about 16.3 kg/month and construction waste is about 12.6 kg/month respectively. The examination department generated paper waste in large quantity in the college. The glass waste is produced in minimum quantity i.e. 1.9 kg/month. Besides, the above-mentioned wastes, plastic waste is generated in the form of plastic wrappers of food items, old broken chairs, old broken water tank, etc.

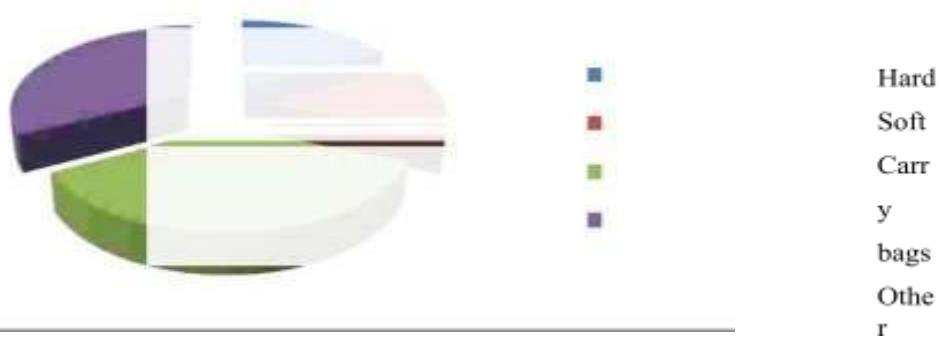
**Category wise solid waste percentage (%)**



**Plastic waste generation and its distribution in college campus**

Category	Plastic kg/ month				Total
	Hard	Soft	Carry Bags	Other	
Quantity	0.98	0.82	2.1	1.90	5.8
Percentage	16.89	14.13	36.20	32.75	100

**Categorization of plastic waste at Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari**



The graph shows that the hard plastic and carry bag waste is generated in higher amount which is 36.2% and 32.75% respectively. The soft plastic and other plastic waste also generated in the college is 14.13% and 16.89% respectively



### e. Hazardous waste audit:

Rajasthan Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce is one of the well-known educational institutes' having 1111 student strength. This college caters the facility for Interior Design, Landscape & Building Site Supervisor students in their campus. No chemical hazardous waste provided.

### f. E-waste:

Generation of e-waste is found on every educational institute. It is observed that the E-waste generated at Rajasthan Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce is of Schedule II category. Computers, Printers, Laptops, Scanners, Internet Routers and Xerox machines are used for administrative work. The wire required for the connectivity also gets included in the e waste. The Rajasthan Sammelan's Trust has its own computer laboratory of 176 computers. The library uses some electronic scanners which after its use can become e-waste. We have proper disposal system for e-waste and also we have set-up e-waste collection box for the students inside the premises.



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## Key Observations:

- The average waste generated in the college is. 57.8 Kg/month
- Highest quantity of solid waste is of paper waste 16.3 Kg/month Biodegradable waste is 12.6 Kg/month.
- Plastic waste is about 5.8 % to the total solid waste on the college campus. Some of the classrooms were found without solid waste baskets.
- There is need of some improvements into the collection of solid waste. Solid waste is to be segregated at the source.



## g. Ambient air quality status:

Ambient air sampling is important part of environmental monitoring. Particulate matter and trace gases sampling were carried out on the college campus. The sampling was carried out using calibrated Handy Dust Sampler APM 821 with flow rate 1 lit/min equipped with

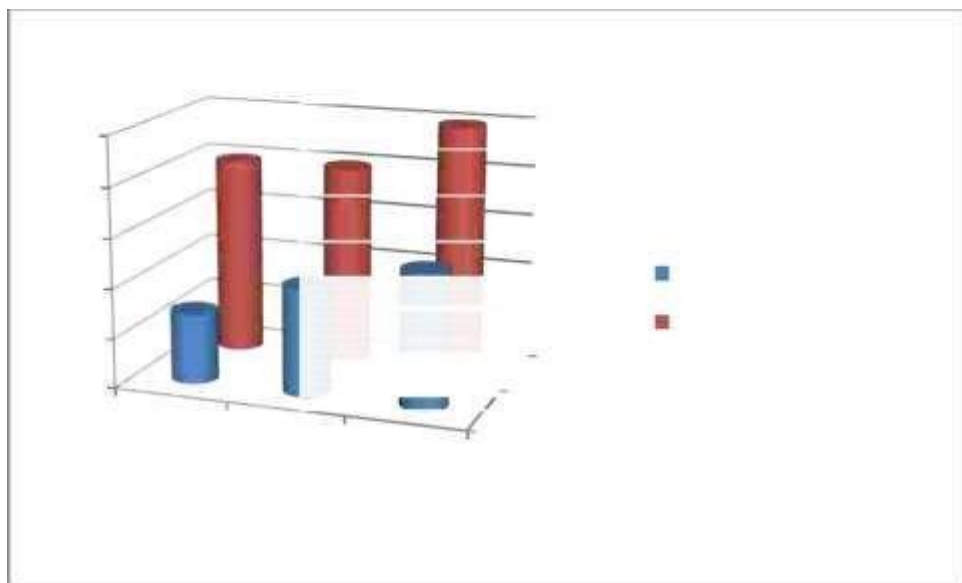


glass fiber filter paper (size 25 mm). The sampling period was 2 hrs.

Sulphur dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) in the air were estimated with West and Gaeke method and Jacob and Hochheisser modified method respectively. Particulate matter (PM<sub>10</sub>) was measured gravimetrically. The samples were collected and analyzed in the approved laboratory. The details of air quality status in the college are given as below:

**Ambient air quality status of Rajasthani Sammelan’s Ladhidevi  
Ramdhar Maheshwari Night College of Commerce**

Sr. No.	Parameters	Results (µg/m <sup>3</sup> )	CPCB Standards
			(µg/m <sup>3</sup> )
1	Sox	28.57	80
2	NO <sub>x</sub>	43.33	80
3	PM <sub>10</sub>	53.61	100



lyzed were within the Ambient  
a. The air quality is good in the

results  
(µg/m<sup>3</sup>)  
CPCB Standards  
(µg/m<sup>3</sup>)  
ards

Results  
(µg/m<sup>3</sup>)

S  
O  
x  
  
N  
Ox  
x  
  
P  
M  
10

college campus as well as surrounding.

**Ambient air quality status of Rajasthani Sammelan’s Ladhidevi  
Ramdhar Maheshwari Night College of Commerce**

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**h. Ambient noise monitoring status: –**

Ambient noise monitoring was carried out in different areas of college campus like at college campus entry, college gate, and corridor, floor. The sampling was carried out using calibrated Sound Level Meter (AZ 8921) by logarithmic scale in Decibels (dB). The noise readings were collected in the college campus and calculated. The details of noise status in college campus are given as below:

**Ambient Noise levels in Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce.**

Sr. No.	Site Name	Results	Standards (Day Time)
		dB (A) Leq	dB (A) Leq
1	College Campus Entry	66.21	50
2	College Gate	62.04	50
3	Corridor	60.82	50
4	Library	36.17	50

Note: - 1. All parameters expressed in dB (A) Leq.

2. Monitoring is carried during day time.

3. Day time is from 6.00 a.m. to 10.00 p.m.

It is observed from the table that the Ambient Noise levels overall in college is on higher side except ladies hostel as compared to the standards of Central Pollution Control Board for the day time.

Since the college is located adjacent of main roads and therefore, the major source of noise is automobile noise, rolling noise. The human communication and transportation are causing high level sound. It is advisable to increase the green cover in the surrounding to

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avoid noise.

**Parking and traffic management:** Parking inside the college premises and outside the college premises is strictly prohibited, but there is a special parking area allowed by the local authorities nearby the college.

**Bird's diversity:**

The diversity among birds is striking. Birds live in a variety of different habitats. Birds that live in different habitats will encounter different foods and different predators. Birds can be carnivores (feeding on other animals), herbivores (feeding on plants), or generalists (feeding on a variety of foods).

Sparrow, crow, bulbuls, Pigeon, Cuckoo, Butterfly, etc these species are seen regularly around the campus.

**i. Details of tree census in college campus:**

The beginning of the 21<sup>st</sup> century brought growing concern about global warming, climate change, food security, poverty, and population growth. CO<sub>2</sub> is a principle component causing global warming. Atmospheric carbon dioxide levels have increased to 40% from preindustrial levels to more than 390 parts per million CO<sub>2</sub>. On this background it is a need of time to cover the educational campuses with green cover interrelated with climate change.

The current is a present status of vegetation and carbon storage assessment of area under the Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce. In an era of global warming and climate change; carbon emission, carbon sequestration, mitigation, adaptation are the keywords in academia. Carbon sequestration is a phenomenon of converting atmospheric carbon i.e. CO<sub>2</sub> in to other pools of carbon such as vegetation, soil, ocean etc. in various forms to mitigate global warming. It is one of the important clauses of Kyoto Protocol. Current tree census methodology has been adopted from the guidelines set by Indian Institute of Remote Sensing, Dheharadoon, Govt. of India.

Total number of trees enumerated on Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce: Total 25 numbers of potted plants

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## CONCLUSION AND MANAGEMENT PLAN

The Sahyadri Group Enriching Nature Environment and Science, Kolhapur has conducted a Green Audit of Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce in the academic year 2021-22. Green auditing is the process of identifying and determining whether institution practices are eco-friendly and sustainable. The main objective of college to carry out green audit is to check green practices followed by college and to conduct a well formulated audit to understand where we stand on a scale of environmental soundness.

### Conclusions:

From the green audit conducted by college following are some of the conclusions which can be taken for improvement of the college campus to become environment friendly college campus.

1. College takes efforts to **dispose majority waste by using proper methods.**
2. **Confidential paper waste is disposed properly.**
3. **Glass waste is to be disposed properly.**
4. Electricity consumption is more at some departments.
5. Use of **CFL** lamps in the college is minimum. Its use should be encouraged and now converted to **LED** lights.
6. Toilets and bathrooms are consuming more water.
7. Roof top rain water harvesting should be planned which is useful for filling up of tanks on campus.
8. **E-waste segregation, handling and disposal are properly done.**
9. Practice of waste segregation to be initiated.
10. Air quality on the campus is comparatively good
11. Conduct more seminars and group discussions on environmental education and awareness.

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## Recommendations:

Following are some of the key recommendations for improving campus environment.

1. College should develop its own Environmental Policy by using guidelines given in Green Audit document.
2. The data related to all measured environmental parameters should be monitored and recorded regularly and information be made available to administration.
3. The college should develop internal procedures to ensure its compliances with environmental legislation and responsibility be fixed to carry out it in practice.
4. Wherever possible the waste should be reused or recycled.
5. Practice of waste segregation to be initiated.







# Sahyadri Group Enriching Nature, Environment and Science

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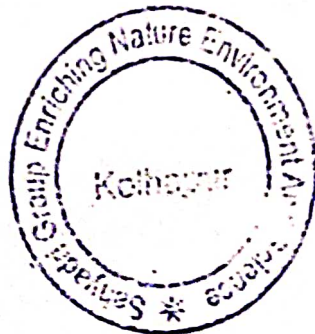
E-mail: sahyadrigenes@gmail.com

Date - 14<sup>th</sup> December 2021

## Green Audit

### Certificate

This is to certify that Rajasthani Sammelan's Ladhidevi Ramdhar Maheshwari Night College of Commerce, Mumbai has conducted a detailed Green Audit of their campus and has submitted necessary data and credentials for scrutiny. The activities and measures carried out by the college have been verified based on the report submitted and was found to be **Satisfactory**. The efforts taken by the faculty and students towards Green and sustainability is highly appreciated and commendable.



*Boomb*  
President  
Sahyadri-GENES  
Kolhapur