- 1. Energy Audit Report
- 2. Environmental Audit Report
- 3. Green Audit Report
- 4. ISO Certificate
- 5. Quality Audit Report

# **Energy Audit Report**

# **ENERGY AUDIT REPORT**



# Shri Ram College Parikrama Marg

**MUZAFFARNAGAR 251001** 

Co-ordinator IOAC, Shri Ram College, Muzaffarnagar CHairman CHairman IQAC, Shri Ram College, Muzaffarnagar

# **ENERGY AUDIT**

#### **CERTIFICATE**

This is to certify that an "Energy Audit" for the Shri Ram College, Parikrama Marg, Muzaffarnagar 251001, has been conducted in June 2023 to assess energy costs, availability and reliability of supply of energy, energy conservation technologies, ways to reduce energy consumption and wheeling of electricity generated through solar panels.

Place: Muzaffarnagar

Date: 27th June 2023

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#### **Executive Summary**

Natural resources on earth are limited and consuming very sharply. It can be saved by employing energy efficiency and it is very necessary to prevent depletion of natural resources. The Electrical audit of any organization shows that the load of electrical equipment's is significant and some necessary step for reducing energy conservation should be taken. Today energy conservation plays a very important role for energy conserving because energy consumption is increasing day by day but the natural resources are not increasing and also generation is not match with consumption People should aware about energy conservation and reduce energy consumption by adopting modern technologies.

Energy Audit attempts to balance the total energy inputs with its use and serves to identity all the energy streams in the systems and quantifies energy usage's according to its discrete functions. Energy Audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating & maintenance practices of the system. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply, decision on appropriate energy mix, decision on using improved energy conservation equipment's Instrumentations and technology.

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. it attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs availability and reliability of supply of energy, decide on appropriate energy mix, identity energy conservation technologies, retrofit for energy conservation equipment etc. The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. The present report shows the energy audit of Shri Ram College campus in terms of pre-audit phase, audit phase and

post audit phase.

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ENERGY AUDITING REPORT Shri Ram College, Muzaffarnagar

#### 1. Introduction

In broad sense, Energy Efficiency means economizing on the use of energy without adversely affecting economic growth and development. It includes improving the efficiency of energy extraction, transmission and distribution and increasing the productivity of energy use.

#### **Designated consumers**

Central Govt. specify the following criteria for energy Intensive Industries and other establishment. (As per EC Act 2001, Section 14(e), for Industries Electrical connected load 5000 KW and above Designated Consumes to get energy audit by Accredited energy audit firms.

#### **Bureau of Energy Efficiency (BEE)**

The Bureau of Energy Efficiency is an agency of the Government of India, under the Ministry of Power created in March 2002 under the provisions of the nation's 2001 Energy Conservations Act. The agency's functions is to develop programs which will increase the conservation and efficient use of the energy in India.

#### 2. Energy Audit

As per the Energy conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiently with cost benefit analysis and an action plan to reduce energy consumption".

There are three phase of Energy Audit

- 1. Pre audit phase
- 2. Audit phase
- 3. Post audit phase

Above phase include following stages

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- 1. **Data Collection** In preliminary data collection phase, exhaustive data Collection was performed using different tools such as observation survey communication with responsible persons and measurement. Following steps were taken for data collection:
  - The tam went to each department, center, library, cafe etc.
  - Data about the general information was collected by observation and interview.
  - The power consumption of appliances was recorded by taking an average value in some cases.
- 2. **Data Analysis** Detailed analysis of data collected include: calculation of energy consumption, analysis of latest electricity bill of the campus understanding the tariff plan provided by the PachimanchalVidyutVitran Nigam. Data related to water usages were also analysed using appropriate methodology.
- 3. **Recommendation** On the basis of results of data analysis and observation, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of diesel in generator has to be reduced for the sake of good environment. The above target areas particular to the college was evaluated through a schedule for the collection. The formats of these are given below:-

#### 3.1. Pre audit Phase

- 3.1.1. Survey Form for data collection
- a. List ways that you use fuel in your college. (electric stove, kettle, microwave,
   LPG, firewood, diesel and others).
- b. Electricity bill amount for the last five years.
- c. Amount paid for LPG cylinders for last one year.
- d. Weight of firewood used per month and amount of money spent? Also mention the amount spent for petrol/diesel/others for generations?
- e. Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.
- f. How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month.
- g. How many LED tube lights and lumps has your college installed? Mention use (Hours used/day for how many days in a month).

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- h. Energy used by each bulb per month? (for example- 60 watt bulb x 4 hours x number of bulbs = kwh).
- i. How many LED bulbs are used in your college? Mention the use (Hours used/day for how many days in a month).
- j. Energy used by each bulb per month? (kwh).
- k. How many fans are installed in your college? Mention use (Hours used/day for how many days in a month).
- 1. Energy used by each fan per month? (kwh).
- m. How many air conditioners are installed in your college? Mention use (Hours used/day, for how many days in a month).
- n. Energy used by each air conditioner per month? (kwh).
- o. How may electrical equipments are installed your college?
- p. Mention the use (Hours used/day for how many days in a month).
- q. Energy used by each electrical equipment per month? (kwh).
- r. How many computers are there in your college? Mentioned the use (Hours used/day for how many days in a month)
- s. Energy used by each computer per month? (kwh)
- t. How many photocopiers are installed by your college? Mention use (Hours used/day for how many days in a month).
- u. How many inverters your college installed? Mentions use (Hours used/day for how many days in a month)
- v. How many cooling apparatuses are in installed in your college? Mention use (Hours used/day for how many days in a month)
- w. Energy used by each cooling apparatus per month? (kwh) Mention use (Hours used/day for how many days in a month)
- x. Energy used by each photocopier per month? (kwh) Mention the use (Hours used/day for how many days in a month).
- y. Energy used by each inverter per month? (kwh)
- z. How many electrical equipment are used in different labs of your college?

  Mention the use (Hours used/day for how many days in a month)
- aa. Energy used by each equipment per month (kwh)
- bb. How many heater are used in the canteen of your college? Mention the use (Hours used/day for how many days in a month)
- cc. Energy used by each heater per month? (kwh)

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- dd. No of street lights in your college?
- ee. Energy used by each street light per month? (kwh)
- ff. No of TV in your college and hostels?
- gg. Energy used by each TV per month? (kwh)
- hh. Any other item that uses energy (Please write the energy used per month)

  Mention the use (Hours used/day for how many days in a month)
- ii. Are any alternative energy sources/nonconventional energy sources in photovoltaic cells in your college? specify
- jj. Do you run "switch off" drills at college?
- kk. Are your computers and other equipment put on power-saving mode?
- 11. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby mode most of the time? If yes, how many hours?
- mm. What are the energy conservation methods adapted by your college?
- nn. How many boards displayed for saving energy awareness?
- oo. How much ash is collected after burning fire wood per day in the canteen?
- pp. Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

#### 3.2 Audit Phase

In Shri Ram College energy auditing was done with the help of engineers Shri Ram Technologies. The energy audit began with the teams walking through all the different facilities at the college, determining the different types of appliances (lights, taps, fridges, etc.) and utilities (Buildings, Toilets, Parks, & Open Areas) as well as measuring the usage per item (Watts indicated on the appliance) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and students were interviewed to get details of usage, frequency or general characteristics of certain appliances.

#### 3.2.1 Data collection

Data collection was done in the sectors such as source of quergy and energy consumption pattern. College records and documents were verified several times to clarify the data received through survey and discussions. Although whole process was completed within five months from 2019 January to July, 2019 previous energy patterns were also observed.

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#### 3.2.2 Site Tour

Site inspection was done along with students and staff Schedules were answered during the site tour and relevant documents were collected.

#### 3.2.3 Review of Documents and Records

Documents such as electrically bills, registers of electricity, fuel consumption were collected and reviewed.

#### 3.2.4 Site inspection

College and its premises were visited and analyzed by the audit-teams several times to gather information. All the buildings inflations infrastructures using electricity ie. canteen, library, office rooms and parking grounds were visited to collect data Number and type of vehicles used by the stakeholders were counted and fuel consumptions for each vehicle was verified with the user. Number of LPG cylinders used in labs, canteen and hostel kitchen mess were also counted. Leakage of a few water taps were noticed during the site inspection.

| Total Area         | 31704 M <sup>2</sup>    |
|--------------------|-------------------------|
| Total Cover Area   | 13657.90 M <sup>2</sup> |
| Road and Open Area | 5336.72 M <sup>2</sup>  |
| Ground Coverage    | 3613.25 M <sup>2</sup>  |
| Open Area          | 28090.75 M <sup>2</sup> |

Table 1: Total Campus Area & College Building Spread Area

3.2.5 Energy Sources and Consumption Areas There were 2 hostels, 5 academic blocks, cafe, stores, generator room and supporting infrastructures like library, labs auditorium and cafeteria.

To accommodate the increased infrastructural development and growing academic activities, one new block is constructed in Shri Ram College for accommodate the extensive strength of students. The building is designed to support modern educational and administrative functions, which require a reliable and

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Chalrman QAC, Shfi Ram College Muzaffarnagar enhanced power supply. Now we have a total of 6 academic blocks in Shri Ram College.

The electrical load extension involved a detailed assessment of the anticipated power requirements based on the installed equipment, lighting, HVAC systems, lift system, computer labs, and other utilities. The infrastructure upgrade included installation of a new distribution transformer, enhancement of the main LT panel, laying of underground armored cables, and provision of dedicated earthing pits to ensure safety and stability. Necessary approvals and clearances were obtained from the concerned authorities, and the work was executed following standard electrical safety norms and Indian Electricity Rules. The details of load extension is mentioned in the observation section of energy usage.

#### 3.2.5.1 Energy Sources

To promote sustainable energy usage, a **160 KW solar power system** has also been installed. This solar panel setup is the primary source of electricity during normal conditions, significantly reducing dependence on conventional energy sources.

However, in adverse conditions such as cloudy weather or during nighttime when the solar panels are not generating electricity, the campus switches to conventional power backup systems. In the event of a power outage, electricity is supplied using **diesel-powered generators** to meet the increased demand.

To fulfill the power requirements during such situations, the backup system is capable of supplying up to three times the usual load.

#### **Installed Generators:**

- Generator 1: 160 KVA
- Generator 2: 82.5 KVA
- Combined Capacity: 242.5 KVA

The power efficiency of the generators is 85%, providing an effective usable output of approximately 206.13 KVA. This backup system ensures uninterrupted power supply to essential campus units when solar and grid power are unavailable.

#### 3.2.6 Key Finding and Observations of Energy Usages

The base of energy audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions,

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Chairman IQAC, Shri Ram College, Muzaffarnagar activities, events, information. The audit process seeks, on a sampled basis, to track past actions events and procedures to ensure that they are carried out according to systems requirements and in the correct manner. Energy audits form a part of a process. Although they are individual events, the real value of energy audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time.

Although audits are carried out using policies, procedures, documented system and objectives as a test, there is always an element of subjectivity in an audit. The essence of any energy audit is to find out how well energy management equipment is performing. Each of the three components are crucial in ensuring that the organization's energy performance meet the goals set in its energy policy.

|        | onsolidate Shri Ram<br>ils of Unit, & Bill Ar | <u> </u>   | _           |
|--------|---|------------|-------------|
| S. No. | Month   | Units      | Bill Amount |
| 1 .    | July  | 12137.322  | 352824      |
| 2      | August  | 12860.104  | 310506      |
| 3      | September                                     | 14257.114  | 352248      |
| 4      | October                                       | 11321.953  | 357462      |
| 5      | November                                      | 6669.910   | 303915      |
| 6      | December                                      | 11271.712  | 302293      |
| 7      | January                                       | 8989.529   | 276318      |
| 8      | February                                      | 17151.858  | 2432.16     |
| 9      | March   | 19825.953  | 210115      |
| 10     | April   | 22934.768  | 169989      |
| 11 .   | May   | 16969.619  | 250742      |
| 12.    | June  | 15627.199  | 343826      |
| •      | Total   | 170017.041 | 3473454     |

Table 2: Details of Unit & Bill Amount

• Electricity Charges Rs. 289454.00 /month

Number of Generators = 2 (163KVA & 83 KVA)

Cost of generator fuel = Rs 25000/month

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- ❖ Total cost of energy = Rs 314454.00/month
- ❖ Number of LED Tube = 859
- ❖ Number of LED ceiling lights = 201
- Number of fans = 534
- Number of Air conditioners = 74 (132 kW)
- ❖ Number LED fours lights = 112
- ❖ Total Electrical Equipment's in Lab = 130
- Number of Photocopiers = 4
- Number of Televisions = 9
- Number of Printers = 42
- Energy generation by solar panels 180 kW

#### 3.2.7 Already Exiting Power Saving Measures

- We already have Solar Geysers Installed in hostels and Mess
- Turn off electrical equipment's when not in use.
- ❖ False ceilings in class rooms and offices for maintaining optimum room temperature.
- \* Resistance regulators Being replaced with electronic regulators.
- Master switches installed outside rooms in hostels.
- CFLs are being replaced by more efficient LEDs.
- ❖ Use computers and electronic equipment's in power saving mode

#### 3.2.8 Recommendations for Better Energy Efficiency

Based on the analysis of the power consumption data, certain steps have been recommended for improving energy efficiency of the campus. Complete cost analysis of implementation of recommended measure has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed. Described below are some important recommendations for better energy efficiency.

#### 3.2.8.1 Low/No investment (Immediate Replacements)

#### a. Housekeeping

Curtains - Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.

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#### b. Better Practices for AC

The institute has in total 57 window type ACs and 17 split type ACs which make a very large part of total energy consumption of the campus. But, at many places it was found that Ac is not used with best recommended practices. Even simple things, such as insulation, are not taken care of Window panes were found broken at many places. Also, at certain places ACs were found to be used without keeping curtains. These poor practices account for increase in AC load and thus consumption.

Summarized below are some guidelines for most efficient use of ACs:

- ❖ Proper Insulation Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed property so as to prevent cool air go out and hot air come in.
- ❖ Operating The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room.

#### c. Replacing 3 star rated Air Conditioner to 5 star rated Air Conditioner

In an effort to enhance energy efficiency and reduce operational costs, it is proposed to replace the existing 1 Ton, 3-Star rated Air Conditioner (AC) with a 1 Ton, 5-Star rated AC in the designated area.

| Parameter                      | 3-Star Rated AC       | 5-Star Rated AC       |
|--------------------------------|-----------------------|-----------------------|
| Cooling Capacity               | 1 Ton (12,000 BTU/hr) | 1 Ton (12,000 BTU/hr) |
| Energy Efficiency Ratio (EER)  | ~3.2                  | ~3.8 – 4.0            |
| Power Consumption              | ~1.1 – 1.2 kW         | ~0.9 – 1.05 kW        |
| Daily Energy Use (8 hrs/day)   | ~8.8 - 9.6 kWh/day    | ~7.2 8.4 kWh/day      |
| Monthly Energy Use (8 hrs/day) | ~264 – 288 kWh/month  | ~216 – 252 kWh/month  |

**Table 3: Technical Comparison** 

#### **Expected Benefits:**

Reduced Power Load: The 5-star AC will reduce the electrical load by approximately 0.15

Co-ordinator IOAC, Shri Ram Çollaga Muzaffarnagar Chairman IQAC, Shri Ram College, Muzaffarnagar -0.25 kW per unit.

**Energy Savings:** Estimated monthly energy savings of 40 - 70 kWh, translating into noticeable reductions in electricity bills.

**Environmental Impact:** Lower energy usage contributes to reduced carbon emissions and supports green campus initiatives.

**Long-term Cost Efficiency**: Though initial investment may be higher, operational cost savings will offset the expense within 1.5 - 2 years.

#### 3.2.8.2 High Investment/Long Term Replacement

#### 1. Energy substitution (Electrical Energy to Solar Energy)

As we know in our campus there is a huge consumption of electrical energy which is not economical so instead of using electrical energy we switch to alternate energy source which is solar energy.

The major energy consumption units are main building and management block, so we have shown the calculation for the no of solar panels for these buildings only.

Cost analysis of solar panel for

| • Total Capacity |  | 160 kWp |
|------------------|--|---------|
|------------------|--|---------|

Production Output
 465 Units/ Day

Life of Solar Panels
 25 years

• Life of Inverters - 5 years

• Total Cost of Installation - Rs. 85,70,000.00

• Subsidy Amount - Rs. 25,70,000.00

• Net Cost - Rs. 60,00,000.00

• Cost per Watt - Rs. 37.50

• Total Generation per month - 13974

• Generation Value - Rs. 142534.80

Annual Saving
 Rs. 17,10,417.60

Payback Period
 5 Years

#### 2.2.9 Consolidation of Audit Findings

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- The communication process for awareness in relation to energy conservation is found adequate.
- Average power factor of 1.0 is maintained
- Assessment of electrical load calculation has been done by the college.
- Monthly use of electricity in the college is not very high.
- Objectives for reducing energy, water and fuel consumption are sufficient.
- Energy efficient equipments are being used by replacing the old non-energy efficient fans.
- Regular monitoring of equipment's and immediate rectification of any problems in being done.

#### 2.3 Post audit phase

Follow Up and Action Plans

Energy audits form a part of an on-going process. Innovative energy saving initiatives has to be designed and implemented every year to make the college environmentally sustainable. Follow up programs of energy auditing recommendations should be done meticulously before the next audit.

Already the college has started replacing the CFL lamps with LED lamps. 5-star rating fans are purchased for newly constructed buildings. Biogas plant already working in the campus. All the rooms are provided with curtains to reduce temperatures. Solar Energy of 160 KW is in working mode. Street light sensor already provided. Water level controller are installed on all the pumps. Low rated efficiency 10 Air conditioners are replaced and the rest will be replaced soon. This report clearly shows that Shri Ram College authorities and management is committed to save energy and to generate green energy not only for campus consumptions but to wheel it to main grid of electricity board.

Co-Adrikator OAC. Shri Ram College Muzaffarnagar Chairman IQAC. Shri Ram College, Muzaffarnagar





(2022-2023)

# **ENVIRONMENTAL AUDIT REPORT**



PREPARED

BY .

DEPARTMENT OF BIOSCIENCE

SHRI RAM COLLEGE, MUZAFFARNAGAR

Co-dictinator IGAC, Shri Ram College; inuzaffarnagar Chairman IQAC, Shri Ram College. Muzaffar nagar

## ENVIRONMENTAL AUDIT REPORT

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# **Environmental Audit Report**

of

# Shri Ram College, Muzaffarnagar

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| KI Lear wal | IQAO  | TOMORNIE         |

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#### **Executive Summary**

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

The rapid destruction of the local, regional and global environment is driving us into a world of "environmental poverty." Population stabilization, adoption of environmentally friendly and sustainable technologies, reforestation and ecological restoration are key elements to creating a just and sustainable future where people live in harmony with nature and its resources.

Therefore, educational leaders must initiate and support the mobilization of internal and external resources and knowledge to enable their institutions to respond to environmental challenges. As a college and research institution, SRC is deeply convinced and concerned about the urgent need to address the following issues and reverse the trend of environmental destruction.

We believe that humans should be stewards of nature and that we all play a vital role in preserving the planet's resources in the long term. As a university of higher education, SRIC is aware of its

IQAC, Shri Ram College Muzaffarnagar

#### ENVIRONMENTAL AUDIT REPORT

responsibility towards environmental issues and has therefore decided to play a leading role in the education, research, policy development and knowledge exchange necessary for environmental travel.

This report is based on the approaches and interventions done on part of the College to address the environmental concerns of the College campus. The current environmental audit represents the first stage in our efforts to build environmental sustainability on the campus.

The audit was conducted by a team of faculty and students with support from various stake holders of the college. It is indeed the reflection of SRC's endeavor to exercise leadership in promoting sustainability and an institutional obligation to instill among all students and each of us, and those in the broader community a sense of environmental stewardship.

This commitment of SRC has lead to actions whose reflection is visible remarkably on ground.

This environmental audit conducted is not only significant for the institution, but also for the other institutions to emulate and adopt as a model and therefore contribute regionally or nationally

Co-ord mator IQAC, Shri Ram College, Muzaffar nagar Charman Charman College, Muzaffar naga:

#### Introduction

#### 1.1 Introduction to environmental audit

Environmental audit is a general term that refers to various tests designed to improving environmental standards and verify environmental compliance as well as management, the use of deviations and corrective actions. The aim is to identify environmental practices that will affect the eco-climate inside and outside the affected areas. Green audits are tools that can be used to determine how much energy or water is used; they can also be used to determine the type and volume of waste that can be used in recycling projects or to improve waste management services. It raises awareness of health and promotes a conscious, productive and ethical environment. Makes teachers, staff and students more aware of the impact of green on schools

#### 1.2 Need for environmental audit

Nature is an invaluable gift for all forms of life. Nature's obstacles cause environmental contracts. Unplanned use of resource planets under heavy pressure is on the rise. Therefore, it is urgently necessary to plan resource consumption sustainably to acquire natural resources for future generations. Sustainable development is always popular around the world to save the planet. Resources can save valuable resources on the planet. Measurement of environmental components is the most effective step to conserving and protecting natural resources. If self enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that SRC evaluates its own contributions toward a sustainable future. As environmental sustainability is



Chairman IQAC. Shri Ram College, Muzaffar nagar becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background, it becomes imperative to adopt the system of the "Green Campus" for the Institutes which will lead to sustainable development and at the same time reduces a sizable amount of atmospheric carbon dioxide from the environment.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

#### 1.3 Objectives of environmental audit

Concern about environmental degradation and realization of values of environment are logical consequences of scholarly research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generations of students, SRC has made a self-inquiry on environmental quality of the campus with the following objectives to achieve:

- i. Improving environmental standards
- ii. Benchmarking for environmental protection initiatives
- iii. Sustainable use of natural resource in the campus.



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#### ENVIRONMENTAL AUDIT REPORT

- v. Establishing a baseline of existing environmental conditions with focus on natural and physical environment;
- vi. Understanding the current practices of sustainability with regard to the use of water and energy, generation of wastes, purchase of goods, transportation, etc;
- vii. Awareness generation among students concerning real issues of environment and its sustainability
- viii. Promotion of environmental awareness through participatory auditing process; and
- ix. To create a report that document baseline data of good practices and provide strategies and action plans towards improving environmental quality for future

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#### 1.4 Overview of the College

Shri Ram College, Muzaffarnagar, Uttar Pradesh is a NAAC (A++) Graded 20 years young college having 10 Departments/Faculties with 14 UG and 6 PG courses of various streams. The college is located on a beautiful campus of 25 acres. Accordingly, the College has launched Postgraduate teaching Programmes in Business Management, Financial Management, Computer Sciences, Information Technology, Chemistry, Botany, Zoology, Biotechnology, Computer Science, Physics, Electronics, Agriculture Microbiology, Fine Arts and News Studio etc. Shri Ram College, offering Academic and Research facilities to about 5183 students including research scholars in various Departments and Centres. There are 10 Academic Departments and Centres in the College. A total of 234 full time teaching faculty and 118 non- teaching staff are effectively working for the smooth functioning in the College. The objective identified for the College in the Act is to impart quality education and undertake research in basic and job oriented fields.



Fig 1. Layout map of Shri Ram College, Muzaffarnagar

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IQAC, Shri Ram College,
Muzaffarnagar

Chairman IQAC Shri Ram College, Muzaffarnagar The College is located at Muzaffarnagar city (Delhi NCR), 114 km from Delhi. The region in which the College is located has rich geographic, climatic and cultural diversity. The climate varies from tropical in the northern parts. The average temperature varies from 6-14°C during winters to 37-41°C during summers. The average annual rainfall is 150 mm. The teaching programmes designed by various Academic bodies of the university are interactive, flexible and hands on; directed towards helping learners to gain the ability to confidence and effectively answer real life challenges. College also offers accommodation to about 923 students including scholars. A total of 03 Hostels have been built to accommodate the students, among which 02 are meant for boys and 01 for girls.

The college, in its effort to maximize the teaching learning outcome, has established seven important Centers that offer unique platform and opportunity to the students to have a wholesome learning experience. These centers are: Centre for Holistic Development (CHD), Centre for Industry Interaction (CII), Center for Skill Development (CSD), Entrepreneurship Cell (EC), Women Development Cell (WDC). The important events organized and initiatives taken by these centers have evidently opened the minds of the students to newer ways of thinking. These Centers have taken up cross-cutting issues related to modern lifestyle, gender, caste identity in India, professional challenges, social anomalies etc. SLC is guided by its vision to develop itself as a premier educational institution offering vibrant inclusive environment for the development of excellence in academics, culture, sports and other student empowered activities

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Table 1: Total intake capacity of the hostels in the College

| Name of the Hostel | Total Number of | Total Intake Capacity |
|--------------------|-----------------|-----------------------|
|                    | Rooms           |                       |
| Block K            | 121 •           | 360                   |
| Block L            | 122             | 363                   |
| Total              | 243             | 723                   |

Table 2: Total intake capacity of the hostels in the College

| Name of the Hostel | Total Number of Rooms | Total Intake Capacity |
|--------------------|-----------------------|-----------------------|
| Block M            | 71                    | 281                   |
| Total              | 71                    | 281                   |

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#### Methodology

This compilation is based on the Survey by Questionnaire. The survey was done in the whole campus by dividing it into six sections. On the basis of data requirement, set of questionnaires about electricity consumption, water consumption, waste generation, solid waste collection and transport were prepared.

#### 2.1 Survey bý questionnaire

The committee brainstormed and evolved a questionnaire. Questionnaire survey was conducted in the College. The different questionnaire formats were restructured also with different combinations and modifications. The final sets of questionnaires were prepared based on solid waste, energy, fuel, water, hazardous wastes and E-wastes. The framed questionnaires were distributed among students, scholars and staff of the College to fetch the information pertaining to the Environmental audit.

The questionnaires contained the general information of the concerned section, including name of the section, total number of students and employees, number of buildings along with the area under build up. The maintaining of records for handling of solid and hazardous wastes holds much importance in green audit. It is quite possible that the loss of water and energy resources can occur due to improper maintenances and therefore their assessment holds importance as far as green audit is concerned.

#### 2.2 Data evaluation

The information gathered during the surveys was compiled for the further analysis. It consists of the audit protocol, documentation supplied by the College administration, the auditor's own recordings, results of the sampling and monitoring photographs, records, plans, maps, audit findings and reviewing documentation against standards, policies and action plans and gathering support to the answers of the questions.

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#### ENVIRONMENTAL AUDIT REPORT

#### 2.3 Analysis and reporting

This tabulated data was used for further analysis. Average and percentage values were determined to avoid complications. With the help of student volunteers, the major part of the data was compiled, which the committee analyzed. The data regarding the plantation was assessed by the Department of Biotechnology and Centre for Biodiversity Studies. Built up map was made by the Engineering Department. Data on energy and water was assessed by the Department of ERE and CE, So ET where assessment of data on solid waste generation was carried out by the Department of Botany. The results are depicted graphically to have a quick glance of the status and interpretation of the results of the audit.

#### **Data Analysis**

#### 3.1 Land use

SRC is using land for diverse purposes so that facilities are provided to all concerned for the smooth functioning and working. The College covers an area of 22 Acres. After digital image processing of the area, the information about the area occupied by the various land uses from the map is gathered. The data is reflected in Table 3.



Chairman Chairman College, Muzaffar nagar

Table 3: Area under various land uses in the SRC College

| Land use               | Area (in Square meter) |
|------------------------|------------------------|
| Built up               | 26324                  |
| Green Spaces           | 20043                  |
| Parks                  | 18160                  |
| Playground             | 9996                   |
| Road                   | 14087                  |
| Vehicle Parking Spaces | 1018                   |
| Water Tank             | 535                    |
| Total Area             | 90163                  |

#### 3.2 Energy audit

Energy audit is the key to systematic approach for decision making in the sphere of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies the energy usage according to its discrete functions. The energy is utilized in the Campus for lighting, space heating and cooling, running of laboratory instruments, appliances, water heating, ground water pumping, cooking and transportation.

Co-ordinator College, Shri Ram College,

Charman IQAC, Shri Ram College, Muzaffarnagar The data regarding the energy consumption in the SRC is as following:

Table 4: Total energy consumption of the SRC

| S. | Energy Sources |        | Consumption (annual) |
|----|----------------|--------|----------------------|
| No |                |        |                      |
|    |                |        |                      |
| 1  | Electricity    | Solar  | 170017.041           |
| 2  | Fuel           | LPG    | 22002.21             |
| 3  | Fuel Oil       | Petrol | 1448.11              |
|    |                | Diesel | 831.72               |

The data in Table 4 indicated that the College utilizes renewable as well as non renewable energy sources to meet its energy needs. In terms of monetary value, College spends approximately 67.56 lakhs INR on energy requirement per annum.

Table 5: Monetary resources spend annually in the year 2022 - 2023 on energy requirement

| S. No     | Energy sources                  | Monetary Value (annual) INR |
|-----------|---------------------------------|-----------------------------|
| 1         | Electricity                     | 34.73 lacs                  |
| 2         | Fuel oil                        | 20.63 lacs                  |
| 3         | LPG*                            | 12.2 lacs                   |
| Total exp | enditures on energy consumption | 67.56 lacs                  |

\* Calculations are made on basis on number of LPG cylinders utilized by Hostels, Faculty

16 Co-oldinator IQAC Shri Ram College, Muzaffarnagar Chairman Chairman College Nuzaffarnagar Quarters, Departments and other administrative wings of SRC.

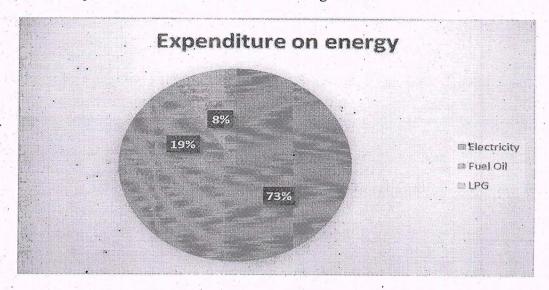


Fig 2: Percentage wise expenditure on energy consumption in terms of monetary values of Shri Ram College

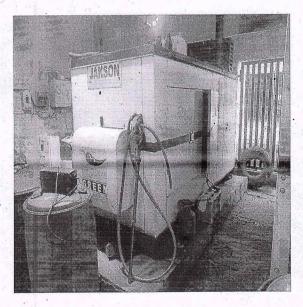
Most of the energy requirement of the College is met by hydropower generated electricity supplied by the State Government. Some amount of energy requirement is met out of the power generated by the Solar Power Plant commissioned in the College.



Plate 1. Solar Power Plant, SRC

Co-ordinator IOAC, Shri Nam College, Muzaftarnagar Chairman Chairman IQAC, Shri Ram College, Muzaffarnagar A 100 KW Grid connected Solar Power Plant in the College is capable of generating 170017.041 units of electricity a year and it serves as a model for using nonconventional energy sources for future. In addition to the solar power and hydropower, diesel generators are also installed as backup in case of power cuts.

Transportation is an important part of any institution relying on the energy consumption. SRC provides transport facility to both students and staff. So Far College owns 12 Operational vehicles of different capabilities which are being used for pick and drop services to distant areas, field surveys and other purposes. College staff members use personal vehicles and their approximate number goes to 150. Students use public transport, indicating lesser carbon foot print of the student community.



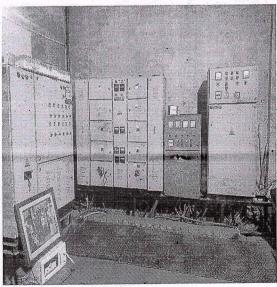


Plate 2. Electricity Generator Room

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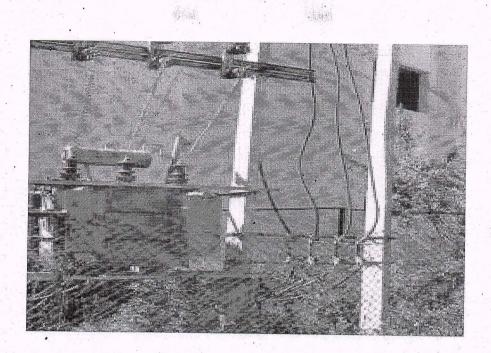


Plate 3: Hydroelectric power transformer installed near Lead Garden/New Library building

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#### 3.3: Water audit

Water audit is conducted periodically to determine water supplied in the distribution system as well as water lost and/or used within a distribution system. It aims to establish the water consumption pattern in individual sections, so as to realise the consumption levels with respect to exploring various pollution prevention and waste water minimization opportunities. Water audit also helps to establish the existing water distribution system as well as waste water collection and recycling, if any. The water is supplied in the College by municipal supply as well as by the ground water supply. The storage capacity of water in the College is shown in Table 6.



Plate 4: Waste Water Treatment Plant in the College

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Table 6: Total water storage capacity in the College (2022-23)

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| S. No. | Storage Resources       | Number | Storage Capacity (in |
|--------|-------------------------|--------|----------------------|
|        |                         |        | litres)              |
| 1      | Water Tanks             | 01     | 20000                |
|        |                         | 01     | 15000                |
|        |                         | 07     | 2000                 |
|        |                         | 24     | 1000                 |
| 2      | Underground water tanks | 01     | 50000                |
| TOTAL  | STORAGE CAPACITY        |        | 123000               |



Plate 5: Water tanks in the College and Water Treatment Plant

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Charman College, Shri Ram College, Muzaffar nagar The total water consumption in the Campus is 1.2 lac litres per day. The per capita utilization of the college is 100 Litres per capita per day. The utilizations of such a huge resource of water include usage for drinking, cleaning, laboratory use, garden use, leakages and overflows sometimes. The waste water generated is disposed off into the underground sewage tanks through waste water drainage to municipal server.

Besides water tanks the college is sustained by perennial springs dispersed all over in the Campus. 02 Ponds of varying dimensions are also laid at the Central Nursery in the Campus. These water bodies have contributed to greening the neighborhood and attracting bird and amphibian animal and plant life. Water of these ponds is used for nursery irrigation, develop-mental works etc. Moreover, Construction of bunds, terraces and drains has led to collection the run off and thus conserving the rainwater as well.



Plate 6: Natural Pond in the College Campus

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Muzaffarnagar

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#### 3.4: Solid waste audit

The solid waste management is in order with the installation of dust bins and their daily cleaning. The college has its own collection facility that collects the solid wastes daily from Residential complex, Hostels and Departments. This helps in maintaining the cleanliness by providing an efficient, safe and regulated management of solid wastes in the Campus.

However, no segregation of the waste takes place during collection and Land filling is the general waste management strategy adopted by the University. However, there is no management plan for managing inorganic waste, especially plastics. Studies were carried to assess the composition of the waste generated in the college. The data showed that the total generation of solid waste in the Campus is 230 kg per day. Out of which non biodegradable is 26 kg per day while the biodegradable is 204 kg per day.

Table 7: Solid waste Generated in College

| Type of waste | Audit Observation   |
|---------------|---|
| Kitchen Waste | • Waste from Hostel mess and canteen is used to make compost andmanure in vermin-composting unit. |
|               | · Solid waste is used as feed and fodder for cattles in Dairy farm.                               |
| Glass Waste   | Empty chemical glass bottles are sending as a scrap material                                      |
| Paper Waste   | One side rough paper is used for the printing of Notices, Time                                    |
|               | Tablesetc. in each department.  |
|               | Waste papers are sending for shredding to prepare thread and card                                 |

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|                                | sheet.  • Email and Mobile media communication is used for minimize the useof paper.   |
|--------------------------------|--|
| Construction Waste             | Construction waste is used for land filling and landscaping within the college premises.   |
| Electrical Waste               | <ul> <li>Electrical waste like damaged electrical board, switches, cut wires are collect by electrician and replace this with new one and remaining wastage is sold as scrap.</li> <li>Electrical waste related to computer, key boards, and mouse is collect by Computer science department for repairing and replaces the damaged one and remaining wastage is sold as scrap.</li> </ul> |
| Laboratory Waste Plastic waste | <ul> <li>Microbiological waste is properly sterilized using Autoclave and thendumped in landfills.</li> <li>Used chemical waste is dumped in landfills.</li> <li>Plastic bottles, caps and other waste material are stored separately atdepartmental level and sold as a scrap material</li> </ul>   |

It is noteworthy that SRC has adopted an environmentally sound practice of converting biodegradable waste into vermi-compost which is a useful resource. The vermi-compost produced is used in the nurseries and the gardens of the college.







Fig 3: Percentage composition of generated waste in SRC





Plate 7: Solid waste collection service and dustbins provided by SRC

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### ENVIRONMENTAL AUDIT REPORT

The study showed that biodegradable waste constitutes significant component of solid waste in the College. The non biodegradable component of solid waste is recyclable. Among the recyclable materials, paper constitutes the maximum share while glass, cardboard and plastics also make a significant share.





Plate 8: Vermi-compost preparation out of Organic Waste on SRC Campus

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#### 3.5: Plantation audit

Many departments of the University maintain their own small gardens. Due to extensive plantation drives the campus is turned into a lush green spot with fair magnitude of biodiversity. More than 2 lac saplings planted in the University have assumed a full canopy now and have attracted a lot of faunal diversity including birds, reptiles and small mammals. More the 75% area of the campus is green having different species including pines, broad leaved trees, shrubs, and perennial herbs.

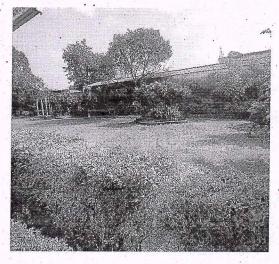








Plate 9: Green Spaces and Parks in SRC

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#### ENVIRONMENTAL AUDIT REPORT

College has established Lead Botanic Garden, Herbal Garden and fernery with the financial support from different funding agencies of Govt. of India. The topography and altitudinal gradient of 700 – 1400 m amsl of the SRC campus helps it support diverse vegetation of the tropical and temperate types. Lead Botanic Garden is the conservatory of more than 400 species of angiosperms belonging to families Poaceae, Asteraceae, Fabaceae, Solanaceae, Lamiaceae, Ranunculaceae, Malvaceae, Menispermaceae, Companulaceae, Zingiberaceae, Liliaceae, etc like Melia azedarach, Populus, Neolamarckia kadamba, Delonix Regia, Tectona grandis, Toona ciliata, Pine, Cycas, Maulsari, Ficus, Eucylyptus, Jade Plant, Casaurina, Pistol Palm, Areca palm, Platycladus orientalis and 12 species of Gymnosperms including Gingko biloba, Zamia sp., Podocarpus sp., Agathis sp., Araucaria sp., Pinus rouxburghii, P. wallichiana, Cedrus deodara, Juniparus prostata, Thuja orientalis, Cupressus sp, Cycas revoluta are also grown in the Lead Garden.

However, Shrubs such as Carissa ophaca, Zanthoxylum armatum, Pittospermum eriocarpum, Rauvolfia serpentine, Hypericum perforatum, Berberis lycium, Berberis asatica, Berberis aristata etc. Besides Climbers namely Gloriosa superba, Asparagus racemosus, Dioscorea deltoidea, Dioscorea bulbifera, Smilax aspera, Rosa moschata, different species of Clematis, Tinospora cordifolia etc are also grown in the Garden of the Campus.

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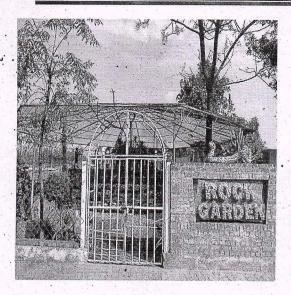




Plate 10: Rock Garden with Xerophytes communities

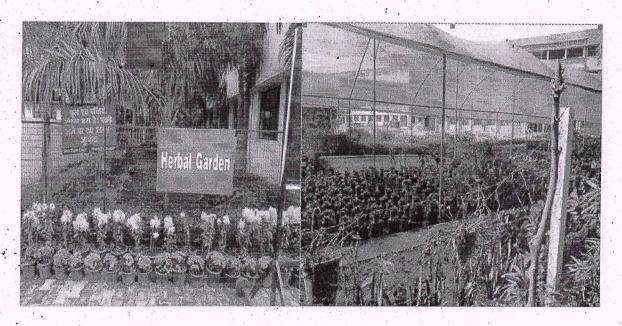


Plate 11: Glimpses of Lead Herbal and Botanical Garden in the College

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Plate 12: Tree Plantation drive in the College Campus

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Muzaffar nagar

Chairman

Chairman

College,

Muzaffarnagar

Table 7: Number of species of different types of vegetation

| S. No | Flora         | Number of Species |
|-------|---------------|-------------------|
| 1.    | Trees         | 853               |
| 2.    | Shrubs        | 236               |
| 3.    | Climbers      | 78                |
| 4.    | Pteridophytes | 52                |
| 5.    | Bryophytes    | 74                |
| 6.    | Grasses       | 132               |
| 7     | Herbs         | 161               |
| 8     | Xerophytes    | 27                |

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Chairman Chairman College, Muzaffarnagar

#### Recommendations

The committee has made short term and long term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of University authorities and also all stake-holders of the University.

- 1. Environmental auditing may be conducted by the University in every two years. The University can also offer consultancy projects on environmental auditing for other academic and research institutions.
- 2. Rainwater harvesting facilities may be established at both administrative and academic campuses, foreseeing future needs of water. Further, rainwater pits can be prepared at appropriate places identified and restoration activities may be initiated to sustain the health of ponds and wetlands in and around the campus.
- 3. Specific waste management plans should be adopted to manage solid waste in the campus, with the assistance of State Swachhta Mission and use of plastic carry bags, thermocol cup, plate and flex boards should be banned inside the College.
- 4. Propose a system for collection and disposal of waste sorted out as organic and others on a daily basis, managed by the campus administration. For managing organic wastes, biogas plants may be commissioned at the hostels, canteens, and staff quarters. The wastes generated can be used for promoting organic farming activities within the campus and the products can be used in hostels and canteens, with a plan to ensure the availability of organic food in the canteen and hostels for future. There should be a system for the management of hazardous wastes.
- 5. The public lights within the campus may be run with solar panels and the replacement of existing lights should be done with LED lamps.

6. Frame a holistic campus development plan to foresee the future developmental needs Chairman College

10AC, Shri Ram College

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#### ENVIRONMENTAL AUDIT REPORT

in tune with green charter adopted by the College.

- 7. All the blocks in the Campus should develop a garden in front of the building and the expenditure for the same may be met from the Department Development Fund.
- 8. Green habitat concept should be adopted for all the building construction activities of the University in future, which may help a long way in reducing energy usage, increasing aesthetic appeal of the buildings and class rooms, besides reducing carbon foot print. Further, more green spaces should be established all around the campus around larger trees and shades for the benefit of the students.
- 9. Fire safety instruments should be installed in all the buildings.
- 10. More public toilets/e-toilets may be established in the campus and in hostels; separate toilets are required for differently abled students.
- 11. Vehicle pooling should be promoted among both students and faculty and use of bicycles should be promoted as a policy of College.
- 12. Irrespective of the subjects, environmental education should be part of curriculum and for the post-graduate programmes at least one credit on environmental should be made compulsory. Alternatively, one credit may be given to students participating in environmental conservation/awareness activities.



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Plate 13: Glimpses of Green Campus

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#### 12.0 ENVIRONMENTAL AUDIT - QUESTIONNAIRE

The areas of eco / environmental / green auditing to be followed / practiced by participating University:

- 12.1.1 Waste Minimization and Recycling
- 12.1.2 Greening
- 12.1.3 Energy Conservation
- 12.1.4 Water Conservation
- 12.1.5 Clean Air
- 12.1.6 Animal Welfare
- 12.1.7 Environmental Legislative
- 12.1.8 General Practices

#### Was any Environmental Audit conducted earlier?

Yes. The College has an ECO club that keep eyes on environmental issues within the university campus and its neighboring area. In that way, this club maintains regular internal monitoring of the environmental issues along with IQAC cell of the college.

Now, the External Audit for Environment has been awarded to UGC – Eco- Services, Muzaffarnagar for a systematic way of monitoring the environmental eminence initiative, taken by College, Muzaffarnagar for environmental protection.

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#### What is the total permanent population of the Institute?

|  | Male .           | Female       | Total |
|--|------------------|--------------|-------|
| Students                                 | 4002             | 2119         | 6121  |
| Teachers                                 | 136              | . 62         | 198   |
| Non-Teaching Staff                       | 82               | 09           | 91    |
| Sub Total                                | 4220             | 2190         | 6410  |
| Approximate N                            | ımber of Visitor | rs (Per day) | 6058  |
| What is the total number of working days | of your campus i | in a year?   |       |

#### Where is the campus located?

The College is located at Muzaffarnagar city NCR, 114 km from Delhi. The region in which the College is located has rich geographic, climatic and cultural diversity. The climate varies from tropical in the northern parts. The average temperature varies from 6-14°C during winters to 37-41°C during summers. The average annual rainfall is 150 mm.. The latitude and longitude of the college is 29.4590959° N and 77.7108574° E respectively.

#### Which of the following are available in your College?

| 1 Garden area   | Available         |
|---|-------------------|
| 2 Play ground   | Available         |
| 3 Playhouse   | Available         |
| 4 Vermi-compost   | Available         |
| 5 Kitchen   | Available         |
| 6 Toilets Co-ordinator College, Shri Ram College, Muzaffarnagar | Available Charman |

| 7. | Garbage Or Waste Store Yard | Available |
|----|-----------------------------|-----------|
| 8  | Laboratory.                 | Available |
| 9  | Canteen                     | Available |
|    | Hostel Facility (numbers)   | Available |
|    | Guest House                 | Available |
|    |                             |           |

## Which of the following are found near your College?

| 1        | Municipal dump yard                   | ' Available   |
|----------|---------------------------------------|---|
| 2        | Garbage heap                          | No Garbage heaps  |
| 3        | Public Conveyance                     | Yes .   |
| 4        | Sewer line                            | NA .  |
| 5.       | Stagnant water                        | No stagnant water   |
| ,6       | Open drainage                         | No  |
| 7        | Industry – (Mention the type)         | College being located in the heart of city                                |
| :<br>(5) |                                       | there is no industry nearby.  |
| 8        | Bus / Railway station/Chartered Cycle | Bus stand is situated near the College.                                   |
|          | Stand                                 | Railway station also near the college                                     |
|          |                                       | named -Muzaffarnagar Railway Station                                      |
|          |                                       |   |
| 9        | Public halls                          | Yes   |
| 10       | Oxygen<br>Park                        | Park for joggers along with children's park in 18160 Square meter of area |

Co-putinator
Co-putinator
Ram College,
Muzaffarnagar

Chairman IQAC, Shri Ram College, Muzaffar nagar

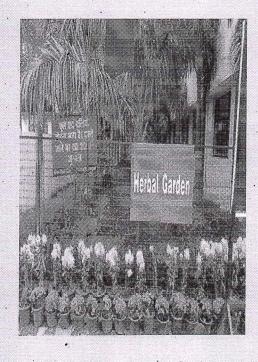
# 12.1 WASTE MINIMIZATION AND RECYCLING

| 1. | Does your college generate any waste?                      | Yes, Solid waste, Canteen waste, paper waste, plastic  |                    |                              |             |
|----|--|--|--------------------|------------------------------|-------------|
|    | If so, what are they?                                      | waste, toiletry  | waste, Horticult   | ure Waste, et                | C.          |
| 2. | What is the approximate amount of                          | Bio  | Non-               | Hazardous                    | others      |
|    | waste generated per day? (in                               | Degradable   | Biodegradable      |                              |             |
|    | Kilograms/month) (approx.)                                 | 5147 kg  | 259 kg .           | 13 kg                        | <100kg      |
| 3. | How is the waste generated in the                          | 25 composting pits are there in campus, Reuse of   |                    |                              | use of one  |
|    | college managed? By  | side printed   | Paper for intern   | al communic                  | cation.     |
|    | 1. Composting  | Sewage water   | r is discharged to | soak pits ne                 | ar toilets. |
|    | 2. Recycling   | Domestic Wa  | aste is given to N | Iunicipal Co                 | rporation.  |
|    |  | Two types of   | f Waste bins are j | provided at c                | ampus for   |
|    | 3. Reusing   | biodegradable and non-biodegradable wast<br>Horticulture waste is converted into compost and |                    |                              | e waste.    |
|    | 4. Others (specify)  |  |                    |                              | npost and   |
|    |  | vermicompo   | st and leftover i  | s given to t                 | he          |
|    |  | municipal co   | orporation.        |                              |             |
| 4. | Do you use recycled paper in the                           | Yes, in acade  | emic evaluation v  | works                        |             |
|    | College?   |  |                    |                              |             |
| 5. | Do you use reused paper in the:                            | Yės  |                    |                              |             |
|    | College?   |  |                    |                              | *           |
| 6. | How would you spread the message                           | Yes, ECO club carries out numerous activities  |                    |                              | activities. |
|    | of recycling to others in the Recycling campaigns, e-waste |  |                    |                              |             |
|    | community? Have you taken any                              |  | npaigns, Tree I    |                              |             |
|    | initiatives? of the pleasellege, IOAC, Shri Ram College,   | developme  | nt goal aw         | varence vairming c. Shri Rai | u College   |

|    | specify.                        | programme.   |
|----|---------------------------------|--|
|    |                                 |  |
|    |                                 |  |
| 7. | Can you achieve zero garbage in | Yes, all the bio-degradable waste may be converted   |
|    | your college? If yes, how?      | to compost which, later on, will be used in its park |
|    |                                 | and gardens. Also, many non- degradable materials    |
| -  |                                 | may also be reused.                                  |

#### **12.2** GREENING THE COLLEGE

8. Is there a garden in your college?



Yes, college has a large number of gardens in its various campuses. It also has a botanical garden in the campus. Most of the PG Department has its own enclosed garden, water body regularly maintained by gardeners. In last twenty years, College has regularly created greenery at the initiative of Hon"ble Chairman, who has taken keen interest in promoting environment in collaboration with forest, environment and climate change department.

9. Do students spend time in the garden?

Plant type

Yes

Approx. number

.10. Total number of Plants in College Campus

Trees

More than 10,000

39 | Page Go-bidinator | 10AC, Shri Ram College

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| Shrubs      |
|-------------|
| Grass cover |
|             |

| Env  | ironment Report                              | WANTE A CONTRACT OF THE PARTY O |                        |
|--|--|--|------------------------|
|  |  | Shrubs   | More than 8,000        |
|  |  | Grass cover  | Approx. 14 acres       |
| 11.  | Suggest plants for your campus.              |  | epal, Neem, Arjun,     |
| awayana dawa waka a | (Trees, vegetables, herbs, etc.)             |  | Ashok, Thuja, Date     |
|  |  | Palm, Mango, Bel   | , Amla, Guava, and     |
|  |  | many more as   | per geographical       |
|  |  | Conditions.  | •                      |
| 12.  | Does the College campus have any Agriculture |  | College                |
|  | Department                                   |  | agreed to create park  |
|  |  |  | maintain its greenery. |
|  | Number of Staff working in Agriculture       | 22-24 gardeners/ Se  | ecurity staff maintain |
|  | Department                                   | the greenery.  |                        |
| 13.  | Number of Tree Plantation Drives             | Yes, 4-5 times re  | egular tree plantation |
|  | organized by college annum. (If Any)         | drives are organ   | ized annually under    |
|  |  | which, more that   | n 1000 plants are      |
|  |  | planted in an acad   | emic year.             |
| 14.  | Number of Trees Planted in Last FY.          | 1200   |                        |
|  | Survival Rate                                | 80%  |                        |
| 15   | Plant Distribution Program for Students and  | Yes, seedlings are   | collected from forest  |

Plant Distribution Program for Students and 15. Community

department nurseries on subsidized rates and are distributed to visiting guests and communities at various green Occasions.

No

16. Plant Ownership Program
Co-Wdinator
College,
IQAC. Shri Ram College,
Muzaffarnagar

IQAC, Shri Ram College, Muzaffarnagar

## 12.3 ENERGY

| 17.     | List few ways that you use       | Electricity is saved by use of LED bulbs for illumination.                |
|---------|----------------------------------|---|
|         | energy in your College.          | LPG is saved by use of Pressure cookers for cooking food.                 |
|         | (Electricity, LPG, firewood,     | Alternate source of energy i.e. Solar Panel Installed in                  |
|         | others). Using this list, try to | Administrative building, central library, HRDC, EDPC,                     |
|         | think of ways that you could     | IMS, Basic science building, Applied science building.                    |
|         | useless energy every day.        | Total solar energy production is 170017.041Wh in the                      |
| •       |                                  | last FY 22-23. More such projects are underway in other campuses as well. |
| •       |                                  | Use of natural lights and natural ventilation are                         |
|         |                                  | encouraged.   |
| 18.     | Are there any energy saving      | Yes, Renewable source of energy through solar plant                       |
|         | methods employed in your         | (183956.014 Wh annually) at several different locations                   |
|         | institute? If yes, please        | (Administrative building, central library, HRDC, EDPC,                    |
|         | specify. If no, suggest some     | IMS, Basic science building, Applied science building) are                |
|         |                                  | installed.  |
|         |                                  | Use of Natural Lights and Natural Ventilation are                         |
| •       |                                  | encouraged.   |
| 19.     | How many CFL/LED bulbs           | 80 % of total conventional bulbs has been replaced by                     |
|         | your university has installed?   | LED Lights.   |
| 20.     | Are any alternative energy       | Yes, photovoltaic cells for solar energy,                                 |
|         | sources employed /installed in   | energy efficient stoves are in operation.                                 |
|         | your university? (photovoltaic   |   |
|         | cells for solar energy,          |   |
|         | windmill, energy efficient       |   |
|         | stoves, etc.,) Specify.          |   |
| 1 I P a | ige co-dramator college          | al Diuman   |

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Chairman IQAC, Shri Ram College, Muzaffarnagar

| 1. | ironment Report  Do you run "switch off" | Yes                                   |
|----|--|---------------------------------------|
|    | drills at college?                       |                                       |
| 2. | Are your computers and other             | Yes, It's being practiced regularly.  |
|    | equipment's put-on power-                |                                       |
|    | saving mode?                             |                                       |
| 23 | Does your machinery (TV,                 | No .                                  |
|    | AC, Computer, weighing                   |                                       |
|    | balance, printers, etc.) run on          |                                       |
|    | standby modes most of the                |                                       |
|    | time? If yes, how many                   | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
|    | Hours?                                   |                                       |

## 12.4 WATER CONSERVATION

| 24.  | List uses of water in your college     | Basic usage of water in campuses are  |
|------|--|---|
|      |  | Drinking, Gardening, Kitchen,   |
|      |  | Laboratories, Toilets etc. and total  |
|      |  | consumption is 789 KL/month   |
| 25.  | How does your university store water?  | Water is supplied through bore well at  |
|      | Are there any water saving techniques  | several locations and distributed using                                       |
|      | followed in your college?              | overhead tanks. We avoid overflow of  |
|      |  | water through control valves provided in                                      |
|      |  | water supply system.  |
| 26.  | If there is water wastage, specify why | Water leakages are immediately attended                                       |
| 1/2  | and how can the wastage be prevented / | by authorized plumbershoff university to IQAC, Shri Ram College Muzaffarnagar |
| Chri | Ram College,<br>Harmagar               | IQAC. Still farnagar  |

|                 | D .    |
|-----------------|--------|
| Environment.    | Report |
| Livi Olillelli. | Report |
|                 |        |

| State of the State | stopped?                                      | conserve water.                           |  |  |
|--|---|---|--|--|
|  | Y S   | Conserve water.                           |  |  |
|  |   | · · · · · · · · · · · · · · · · · · ·     |  |  |
|  | · · · · · · · · · · · · · · · · · · ·         |   |  |  |
| .27.   | Locate the point of entry of water and        | Entry- Ground water Exit- From Water      |  |  |
|  | point of exit of waste water in your          | Drainage System to rain water harvesting  |  |  |
|  | college.                                      | system and some amount is drained in the  |  |  |
|  |   | drainage system.                          |  |  |
| 28.  | Write down few ways that could reduce the     | By Following ways:                        |  |  |
|  | amount of water used in your college          | 1. RWH, close the taps after usage and    |  |  |
|  |   | also by stopping leakages.                |  |  |
| 639  |   | 2. Maintenance and monitoring of          |  |  |
|  |   | valves in supply system to avoid          |  |  |
| •  |   | over flow, leakage and spillage           |  |  |
|  |   | 3. Water Conservation awareness           |  |  |
|  |   | for students, faculties, staffs and       |  |  |
|  |   | residents of the hostels.                 |  |  |
| 29.  | Record water use from the college             | As the water is supplied through bore     |  |  |
|  | water meter for six months (record at         | well and no water meters are installed,   |  |  |
|  | the same time of each day). At the end of the | therefore, accurate estimate of water     |  |  |
| •  | period, compile a table to show how many      | consumption data is not available. We     |  |  |
|  | liters of water have been used.               | propose to install water meter in future. |  |  |

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Chairman

Chairman

Chairman

Chairman

Chairman

Chairman

Muzaffar nagar

| 30. Does your college harvest rain       | Most of the buildings have RWH systems |
|--|--|
| water?                                   | that take care of rain water           |
|  | Wastage.                               |
| 31. Is there any water recycling system. | Yes, RO waste water is stored in tank  |
|  | and reused for cleaning and gardening  |
|  | purpose.                               |



Plate 13: Rain Water harvesting System in the College campus

Co-oldinator

Co-oldinator

Co-oldinator

Ram College,

Muzaffar nagar

Chai/mán IQAC, Shri Ram College, Muzaffarnagar

### 12.5 CLEAN AIR

| 32 | Are the Rooms in college well                        | Yes   | *          |            | •             |       |  |
|----|--|---|------------|------------|---------------|-------|--|
|    | Ventilated ?   |   |            |            |               |       |  |
| 33 | Window Floor ratio of the Rooms                      | Excellent                                     |            |            |               |       |  |
| 34 | Provide details of college owned motorized vehicles? | Buses   | Cars       | Vans       | Other         | Total |  |
|    | No. of vehicles                                      | 08  | .11        | 02         | . 02          | 22    |  |
|    | No. of vehicles more than five year sold             |   | 1          |            | : <del></del> | 1     |  |
|    | No. of Air-conditioned vehicles                      | .0  | ∴ 11       | Ó          | . 0           | 11 -  |  |
|    | PUC done   | · Y   | . Y        | ·Y         | Y             | Y     |  |
| 35 | Specify the type of fuel used by your                | Total (Pi                                     | ivate + co | ollege owr | ned)          |       |  |
|    | college vehicles:                                    |   |            |            |               |       |  |
|    | Diesel   | 25  |            |            |               |       |  |
|    | Petrol   | 269   |            |            |               |       |  |
|    | · CNG  | 0   |            |            |               |       |  |
|    | LPG  |   |            |            |               |       |  |
|    | Electric   |   |            | 02         |               | •     |  |
| 36 | Air Quality Monitoring Program if any                | No monito                                     | ring is be | ing done   |               |       |  |
| 87 | Do students suffer from respiratory                  | Few of the students suffer from respiratory   |            |            |               |       |  |
|    | ailments?  | ailments due to available suspended particles |            |            |               |       |  |
|    |  | and pollens.                                  |            |            |               |       |  |

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Co-ordinator College
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Muzamarnagar

Chairman IQAC, Shri Ram College Muzaffar nagar

Environment Report

38 Details of Genset (Electric Generator)

Yes, 01 Number of Genset. Jakson, green power

### 12.6 ANIMAL WELFARE

| 39      | List the animals (wild and domestic)      | More than 410 squirrels are found in the     |
|---------|---|--|
|         | found on the campus (dogs, cats,          | campus. Approx. 54 dogs, 13 cats, 25         |
|         | squirrels, birds, insects, etc.).         | cows, 15 buffalos, snakes, lizards, and      |
| •       |   | others including butterflies, insects, bees, |
|         |   | earthworms, etc. are there in campus. Also,  |
|         |   | several different kinds of birds are         |
|         |   | abundant. Due to forest in the campus and    |
|         |   | the greenery, we have good number of         |
|         |   | avian population.                            |
| 40      | How many dogs in your area have undergone | 45   |
|         | Animal Birth Control – Anti Rabies (ABC - |  |
|         | AR)?                                      |  |
| 41      | Does your college have a Biodiversity     | Our Eço club takes care of bio-diversity     |
| •       | Programme?                                | conservation program through its             |
|         |   | volunteers headed by Faculty Members.        |
| 1000000 |   |  |

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# 12.7 ENVIRONMENTAL LEGISLATIVE COMPLIANCE

| : 42 | 2 Are you aware of any Environmental Laws  | Yes  |
|------|--|--|
|      | pertaining to different aspects of         |  |
| •    | environmental management?                  |  |
| 43   | Does your college have any rule to protect | They have banned single use plastic. Their   |
|      | the environment? List possible rules you.  | environment policy includes awareness, and   |
|      | could include.                             | environmental conservation efforts through   |
|      |  | Eco club with various Departments. All   |
|      |  | Under Graduates and Post Graduate are  |
|      |  | studying the paper of Environmental  |
|      |  | Sciences, prescribed by UGC course.  |
| •    |  | College has Post Graduate Vocational   |
|      |  | Course - M.Sc. in Biotechnology and  |
|      |  | Microbiology.  |
| 44   | Does Environmental Ambient Air Quality     | NA ,   |
|      | Monitoring conducted by the college?       |  |
| 45   | Does Water and Waste water Quality         | Yes  |
|      | monitoring conducted by the college?       |  |
| 46   | Does stack monitoring of DG sets conducted | Yes, as per DG set rules by the University.  |
|      | by college                                 |  |
| 47   | Is any warning notice, letter issued by    | No extra transfer of the second secon |
|      | State Government bodies?                   |  |
| 48   | Does any hazardous waste generated by the  | No ·   |
|      | college?                                   |  |
|      |  |  |

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Muzaffarnagar

Chairman Chairman College Muzaffarnagar

college? If yes, explain its category and the college under the administrative disposal method

Does any Bio-medical waste generated by the Yes, Bio-medical waste is generated by control of RU. They dispose the biomedical waste as per the guidelines set by the Central Pollution Control Board and monitored by Uttar Pradesh State Pollution Control Board, Ranchi.

रेनिक पश्चिमी प्रान्त बुलेटिन

मुजायफरनाव

नुस्वकारणायुर्वाच्याचे प्राच कृष्टीर रहा है। अपने औराम गुण आगक कहा करें है । मुख्यस्थान के वृद्धान करें है । १२४ इ. इससार प्राच्छा करना किया गई । सर्वे कृष्णाया करें है । १०१४ के नामा स्थान के स्



प्रमान प्रमान और द्वीर च्वी मुख्या स्थानी और वे स्थान कर में होता प्रमाणीय कर्यों विकार माहित्यास्य प्रांतन में विद्यासिकी निकार । पार्थिकाराज्ये क्रांत्रा । स्वत्यक्रमात्रा । प्राप्त अर्थक्रीयाच्यां अस्त्री साम्युक्त प्राप्त प्राप्त अर्थक्रमात्रा विद्यासीक्षण हात स्वत्यक्री स्वत्य साम्या को स्वत्ये विद्यासीक्षण को स्वत्यक्षण अर्थक्रमात्रा । प्राप्त साम्या विद्यासीक्षण को स्वत्यक्षण के स्वत्यक्षण प्राप्त साम्या प्राप्त साम्या कर्मा विद्यासी स्वत्यक्षण के स्वत्यक्षण के स्वत्यक्षण के स्वत्यक्षण के स्वत्यक्षण 

क्यान को संबंधन प्रधान, शीममाँ प्रिमेच वर्थ, प्रदेशोध प्रधान दिएयोंको व्यास एक वर्धनारेक, स्थापित प्रधान प्रधान एक वर्धनारेक, स्थापित प्रधान प्रधान दिएयों स्थाप प्रधान विकास इसके अधित कर्मा व्यास स्था पूर्व साथक केले हुन्यत्व स्थाप प्रधान प्रधान क्यान क्यान प्रधान केले प्रधान प्रधान क्यान प्रधान क्यान प्रधान क्यान प्रधान प्रधान क्यान प्रधान क्यान प्रधान क्यान 

का बीच किसीन करता है। वन किसार हाता परिवारण परिकार के किस कहाता है। परिवारण परिकार के किस कहाता की प्रतिकारण किसार करता के किस में कहाता के किस कारणियां के किस कहाता करता है। किस कारणियां के किस करता कारणियां के किस कारणियां के किस किस कारणियां के किस कारणियां के किस मार्थ प्रकार के किस कारणियां के किस मार्थ प्रकार के किस कारणियां के किस मार्थ प्रकार के किस कारणियां के किस कारणियां

सार्थ पुराने परकार करोड़ियाँ के तर्मना की गाए प्रान्ति परकार करोड़ियाँ के तर्मना की गाए प्रान्ति के की तर्मना की होएगा विकास के कारण कि प्रान्ति के तर्मना की गाएंगा की प्रान्ति की या उसकी विकास प्राप्ति की प्रार्थ की या उसकी विकास प्राप्ति की प्रार्थ की या उसकी विकास प्राप्ति की प्रार्थ की मान्य की मान्य की जाति है। प्रार्थ की मान्य की मान्य की मान्य की मान्य है। विकासी प्राप्तास्त्र को मान्य कराइ

क्री कर्ता के से बहुत के राहते हैं जाता है कर क्रिक क्रिक क्रिक क्रिक है कि स्वार्ध के क्रिक क्रिक है कि स्वार्ध के क्रिक है कि स्वार्ध के क्रिक क्रि ्रमेश में तर्ग हैं . इस्तार्थ जीवन हैं स्थान के बात ने पान का सबसी अपने समोदार हैं . इस्तार का में तर्ग हैं इस्तार्थ में समार समारत में स्वार्थ बात होता का तो त्या होते . सार्थ का होता का तो त्या होते . सार्थ का होता का तो त्या होते . सार्थ का होता होता समार समार्थ का स्थान का होता होता समार्थ का स्थान हाता का

(Planting Trees to Save Earth)

12.8 GENERAL

IQAC. Shri Ram College, Wiuzalfarnagar

| nowtoining to 1:00   |   |
|--|---|
| pertaining to different aspects of   |   |
| Environmental Management?  |   |
| Does your university have any rule to protec   | t Yes, there are some rules like banning of   |
| the environment? List possible rules you could   | single used plastics. Their Environmental   |
| include.   | Policy includes awareness and environmental   |
|  | conservation observed by the students and staffs equally.   |
| Does housekeeping schedule maintained in   | Yes, Swachh Bharat environment  |
| your college campus?   | program is implemented regularly.   |
| Are students and faculties aware of  | Yes, periodically pollution reduction,  |
| environmental cleanliness ways? If Yes,  | plantation, energy conservation awareness,  |
| explain  | water conservation campaigns are carried out  |
|  | by eco clubbed various Departments of the   |
|  | College.  |
| Does Important Days Like World Environment   | Yes. Various Departments like Bioscience,   |
| Day, Earth Day, and Ozone Day etc. are   | Botany, Zoology, Chemistry etc. observe   |
| celebrated by college?   | these environmentally friendly celebrations   |
|  | Around the year.  |
| Does college participate in National and Local   | Yes, Swachh Bharat Abhiyan by students of   |
| Environmental Protection movement?   | the college through their NSS volunteers.   |
| Does College have any Recognition  | College awarded as green campus by UGC  |
| /Certification for environment friendliness?   | Foundation who conducted last green audit in  |
| A CONTROL OF THE STATE OF THE S | the year 2020.  |
|  | Does housekeeping schedule maintained in your college campus?  Are students and faculties aware of environmental cleanliness ways? If Yes, explain  Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. are celebrated by college?  Does college participate in National and Local Environmental Protection movement?  Does College have any Recognition  //Certification for environment friendliness? |

Co-didinator
Co-didinator
Co-didinator
A9 | Page Muzaffar nagar

Chairman IQAC, Shri Ram College, Muzaffarnagar

| Fn | vironment Report  | Yes, College has commendable infrastructure   |
|----|---|---|
| 57 | Does College use renewable energy?  | for generation of solar power and they are almost self- sufficient in their power generation.                                   |
| 58 | Does college conduct a green / environmental audit of its College?                                  | Yes, IQAC cell has conducted Internal  Green Audit and the External Green Audit has been entrusted to Abhinav Gram  Foundation. |
| 59 | Has the College been audited / accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.? | Yes, College has been accredited  By NAAC and granted A++ Grade.  |



# माता भूमि पुत्रोहं पृथिव्या

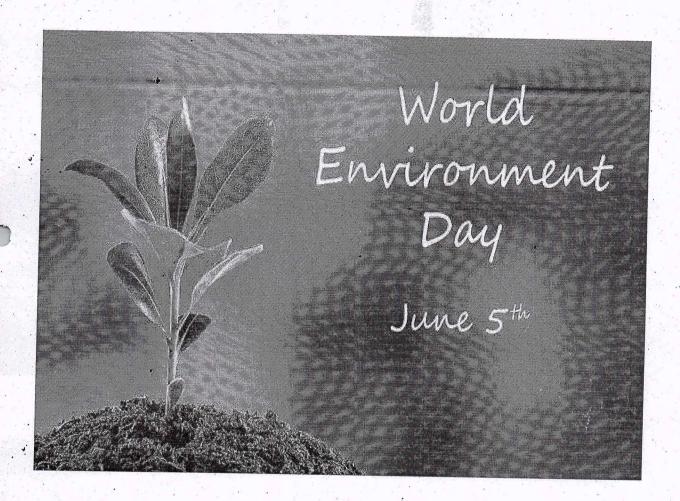
विश्व पृथ्वी दिवस पर आइए हम सब मिलकर प्रकृति के संरक्षण एवं संवर्धन का संकल्प लें

।। विश्व पृथ्वी दिवस की शुभकामनाएं।।

Samvad.in VskMadhyaPradesh Vsk\_mp



Chairman IQAC, Shri Ram College, Muzaffarnagar



Co-prefinator IOAC, Shri Ram College, Muzaffar nagar

Chairman IQAC. Shri Ram College. Muzaffarnagar

# **Green Audit Report**

# GREEN AUDIT REPORT

OF



# SHRI RAM COLLEGE

(Shri Ram Group of Colleges) Muzaffarnagar



Year 2022-23

Dr. C.B. Patel
Department of Botany
R.K. PG College, Shamli
Secretary, Green Audit Committee

**Dr. Rachna Tyagi**Deptt of Botany
D.A.V. PG College, Muzaffarnagar
Chairman, Green Audit Committee

AC. Chri Ram College,

Muzaffarnagar

IQAC, Shri Ram College, Muzaffarnagar

# Shri Ram College, Muzaffarnagar

# **Green Audit Committee**

#### **EXTERNAL AUDITORS**

| S.NO. | Committee Member           | Designation |
|-------|----------------------------|-------------|
| 1     | Dr. Rachna Tyagi,          | Chairman    |
|       | Department of Botany,      |             |
|       | D.A.V. PG College,         |             |
|       | Muzaffarnagar              |             |
| 2     | Dr. C.B. Patel             | Secretary   |
|       | Department of Botany       |             |
|       | R.K. PG College, Shamli    |             |
| 3     | Dr. Mahesh Kumar,          | Member      |
|       | Department of Botany, J.V. |             |
|       | Jain PG College, Baraut.   | [           |
|       |                            |             |

### INTERNAL AUDITORS

| S.NO.                       | Committee Member   | Designation   |
|-----------------------------|--|---|
| 1                           | Dr. Girendra Gautam, Director,<br>Shri Ram College of Pharmacy                     | Co-Ordinator  |
| 2                           | Dr. Naeem Rajput, HOD, Deptt. of<br>Agriculture, Shri Ram College                  | Member  |
| 3                           | Mr. Vikas Kumar, Assistant Professor, Department of Biosciences, Shri Ram College  | Member  |
| 4<br>Ordinator<br>ri Ram Co | Mr. Sachin Kumar, Assistant Professor, Department of Biosciences, Shri Ram College | Member<br>Ç <mark>kairma</mark><br>IQAC, Shri Ram<br>Muzaffarna |

# **Green Audit Report**

# Shri Ram College, Muzaffarnagar Contents

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Co-orWinator IQAC, Shri Nah College, Muzaffarnagar

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IQAC, Shri Ram College, Muzaffarnagar

#### Preamble

It is a fact that the local, regional and global environment is being rapidly destroyed, leading us to a world of "environmental poverty". Stabilizing the population, adopting environmentally friendly and sustainable technologies, reforestation and ecological restoration are the key factors in creating a just and sustainable future in harmony with nature for all people in society. Therefore, educational leaders must initiate and support the promotion of internal and external resources and knowledge so that their organizations can solve environmental problems.

Shri Ram College, Muzaffarnagar is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reserves the trends. We believe that humans should be stewards of nature and that we all have a significant responsibility to protect the planet's natural resources. Shri Ram College, Muzaffarnagar, a flagship college, is committed to playing a significant role in education, research, policy formulation and knowledge exchange that is essential for environmental stewardship.

The current Green Audit represents our efforts to build environmental sustainability inside the SRC campus. Our intention was to keep auditor's report as genuine and transparent as possible. That is why we had invited External Auditors as well. The audit was conducted by a team of eminent scientists and researchers. The external auditors were led by Dr. Rachna

Tyagi, Deptt. of Botany, D.A.V. PG College, Muzaffarnagar and Chairman College, Shanki Ram College, Muzaffarnagar

QAC, Shri Ram College, Muzaffarnagar

4 Muzaffarnagar

and Dr. Mahesh Kumar, Department of Botany, J.V. Jain PG College, Baraut. The Internal Auditors included Dr. Girendra Kumar Gautam, Director, Shri Ram College of Pharmacy, Muzaffarnagar, Dr. Naeem Rajput, HoD, Deptt. of Agriculture, Shri Ram College, Mr. Vikas Kumar and Mr. Sachin Kumar (Assistant Professor, Faculty of Bioscience). We have conducted this audit for the college to create awareness not only among the students, but also in the staff and stakeholders about engagement in eco- friendly activities. We wish to make these activities as a regular part of functioning.

The overall goals of this audit were:

- To introduce students to real concern of environment and its sustainability using the Shri Ram College, Muzaffarnagar Campus as a study site.
- To analyze the pattern and extent of resources use on the campus.
- To make the college a more environmentally sustainable institution of higher learning.
- To bring out a status report on green compliance.

Summing up, in light of above-mentioned goals, we are pleased to submit this Green Audit Report.

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Chairman IQAC, Shri Ram College

### Preface

The concept of "GREEN CAMPUS INITIATIVE" was put forth by Hon Dr Subhash Chandra Kulshreshtha, Founder Chairman, Shri Ram Group of Colleges, Muzaffarnagar. Thereafter, the college management decided to pursue this initiative.

Concept of green campus is not limited to the decorating the college campus but also corporate responsibility, with quality education keep college environment eco-friendly with its facilities. Therefore, attempt has been made on that direction by landscaping and plantation, solid waste management, recycling of waste water, conservation of energy, water conservation, rainwater harvesting and minimum usage of paper.

Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution.

We tried to inculcate value of surrounding environment among the students through Environmental awareness activities like nature club, NSS, Cycle Day, No Vehicle Day Celebration, World Water Day, World Environment Day, Plantation Drives, Quiz Competition on Environment, Organic Farming and Vermicomposting Courses and activity like Best out of Waste competition.

Because of the greenery and eco-friendly sustainable environment, college campus becomes more charming, refreshing and healthier. This increases efficiency of every element of the college.

Co-ordinal College, Chairman IQAC, Shri Ram College, Muzaffarnagar 6 Muzaffarnagar

### Acknowledgement

We take this opportunity to express our gratitude towards the Chairman of the Institute, Hon Dr S C Kulshreshtha and all Hon. Members of the Management Committee of the college for their valuable guidance, continuous encouragement, generous gift of time with constructive criticism & suggestion during the composition of work of entire "Green Audit Report - 2022 – 2023".

We also express our deep sense of gratitude to our Principal Dr Prerna Mittal and Internal Quality Assurance Cell (IQAC) co- Ordinator Dr. Vinit Kumar Sharma who inspired and encouraged us throughout the work. We great fully acknowledge the help provided by him on several occasions.

It is right time to express our deep sense of gratitude to faculties of our sister institutes especially Dr. S N Chauhan, Director, SRGC (IC), Dr. Ashwani Kumar, Principal, SRP, Dr. Manoj Dhiman, Director, SRGC, Dr. Samrat Singh, Director, IIMT, Saharanpur, Dr. Narendra Sharma, Director, CHSCM, Khurja for their continuous help, inspiring resoluteness and sensible suggestion without any reservation whenever we approached throughout investigation. We are also thankful to Dr. Girendra Kumar Gautam, Director, Shri Ram College of Pharmacy for their valuable guidance.

We are equally thankful to our colleagues teachers and students of B.Sc. (Biotechnology) and B.Sc. (Microbiology) – Sharad Malik, Vansh, Riya Malik, Zeeshan, Sharik, Rohit Kumar, Aarzoo which helps during data collection and identification of plants.

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Green Audit Committee-

IQAC. Shri Ram College

Muzaffarnagar

### Principal's Message

I express my hearty wishes for success of this publication of 'Green Audit 2022- 2023'. SRC is one of the unique spiritual educational campuses with quality of education, where we are aware about the environment with cultural development, as fundamental feature of Indian ancient philosophy is a good environmental sense.

The efforts of our institute and sister schools of SRGC Integrated Campus towards the protection of environment and biodiversity are truly unique and can become experimental projects to show how to protect from impending disasters such as earthquakes, landslides etc.

We try to maintain environment eco-friendly through activities like landscaping and plantation, rain water harvesting, solid waste Management, sewage treatment plant, energy conservation, e-waste management, and paperless technology to minimize the use of paper basically prepare from the plants.

The ultimate aim of our institution is to develop youth as fertile probe who understand for their social responsibilities.

The ultimate aim of our institution is to develop youth as fertile probe who understand for their social responsibilities.

I express my hearty wishes for success of this movement of Green Audit Report for the new beginning of the conservation from the doorstep of the people.

Our green audit reflects assessment and achievement of vision and mission of the college.

Co-Minator IQAC, Shri Ram College, Muzaffarnagar (Dr Prerna Mittal)
Principal, Spairman
IQAC, Shri Ram College,
Muzaffarnagar

### **Executive Summary**

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institute which will lead for sustainable development. Shri Ram College is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher learning, the college has started 'Green Campus Initiative' which promoted various environmental friendly practices in combination with curricular education for sustainable and ecofriendly aura in the campus.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology include: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health and learning college operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks. The area of the college premises is 25 acres out of which 'Green Cover' is approx. 19 acre. The tree census was carried out by NSS volunteers along with Green Assessment Committee.

Co-orcinator IQAC. Shri Ram College, Muzaffarnagar

dhairman IQAC, Shri Ram College, Muzaffarnagar In the present audit report, most of the aspects are covered such as tree plantation, awareness about environment programme evaluated by experts. Green campus is the motto of our college and the college has already taken some steps to protect the environment with help of college staff and students under the guidance of Principal Dr. Prerna Mittal, Shri Ram College, Muzaffarnagar.

Co gramator IQAC, Shri Ram College, Muzaffarnagar Chiliman IQAC. Shri Ram College, Muzaffarnagar

### Introduction

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. 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.

Green audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

### Overview of the College

Shri Ram College, Muzaffarnagar, Uttar Pradesh is a NAAC (A++) Graded 20 years young college having 10 Departments/Faculties with 14 UG and 6 PG courses of various streams. The college is located on a beautiful campus of 25 acres. Accordingly, the College has launched Postgraduate teaching Programmes in Business Management, Financial Management, Computer Sciences, Information Technology. Chemistry, Botany, Zoology, Biotechnology, Computer Science, Physics, Electronics. Agriculture Microbiology, Fine Arts and News Studio etc. Shri Ram College, offering Academic and Research facilities to about 5183 students including research

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Chairman
IQAC, Shri Ram College,

scholars in various Departments and Centres. There are 10 Academic Departments and Centres in the College. A total of 234 full time teaching faculty and 118 non- teaching staff are effectively working for the smooth functioning in the College. The objective identified for the College in the Act is to impart quality education and undertake research in basic and job oriented The college has also adopted the 'Green Campus Initiatives' for environmental conservation and sustainability. Greening the campus is all about sweeping away wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program. Institute has to work out the time bound strategies to implement green campus initiatives there are main three pillars i.e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy.

The goal is to reduce CO2 emission, energy and water use, while creating an atmosphere where students can learn and be healthy. The 'Green Campus Initiative' has been active since last few years both as an assembly group of sub committees that actively promote the various projects. The college administration works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. College has won the Award for Green Campus also. 'Green Campus Award' of Himalayan Action Research & Development was given to Shri Ram Colleges by Shri Nityananda, Chief Minister of Uttarakhand.

The uniqueness of the state of

environment and stewardship of natural resources while ensuring the quality of life on the campus. The Master Plan of the Institution has been designed to ensure and sustain a harmonious blend of human and environmental wellbeing. The Institution has undertaken various initiatives to setting up an Eco-Friendly campus:

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Promotion of biodiversity: In its Endeavour for conservation of healthy ecosystems, the Institution has embarked on a plantation drive spread over its campus. The variegated cropping of flowers such as roses, gerbera, gladiolus etc. have been established as livelihood projects within the scope of demonstration farms and seed gardens to demonstrate and promote scientific research in crop development and inter-cropping. Once they start yielding, the institution will promote such plantations in the villages and facilitate Farmers.

- Grid connected roof top solar photo voltaic power projects: The Institution has embarked upon roof-top solar installations at its campus.
- Water conservation and supply management: The Institution has invested enormous resources to ensure sustainable water management and use.

### About Muzaffarnagar

Muzaffarnagar district is a district of Uttar Pradesh state in northern India. It is part of Saharanpur division. The city of Muzaffarnagar is the district headquarters. This district is the part of National Capital Region. Muzaffarnagar City is situated midway on Delhi - Haridwar/Dehradun National Highway (NH 58), the city is also well connected with the national railway network. The city is located in the awiddle of highly fertile upper Ganga-Yamuna Doab region and is IQAC. Shri Ram College, 13

Muzaffarnagar

IQAC, Shri Ram College,

very near to the New Delhi and Saharanpur, making it one of the most developed and prosperous cities of Uttar Pradesh. It comes under the Saharanpur division. This city is part of Delhi Mumbai Industrial Corridor (DMIC) and Amritsar Delhi Kolkata Industrial Corridor (ADKIC). It shares its border with state of Uttarakhand. It is the principal commercial, industrial and educational hub of Western Uttar Pradesh.

#### Geography

Muzaffarnagar is 272 meters above sea level in the Doab region of Indo-Gangetic Plain. It is 125 kilometres NE of the national capital, Delhi, and 200 kilometres SE of Chandigarh, and near to Bijnor, Meerut and Hastinapur.

#### Climate

Muzaffarnagar has a monsoon influenced humid subtropical climate characterized by much hot summers and cooler winters. Summers last from early April to late June and are extremely hot. The monsoon arrives in late June and continues till the middle of September. Temperatures drop slightly, with plenty of cloud cover but with higher humidity. Temperatures rise again in October and the citythen has a mild, dry winter season from late October to the middle of March. June is the warmest month of the year.

The temperature in June averages 30.2°C. In January, the average temperature is 12.5°C. It is the lowest average temperature of the whole year. The average annual temperature in Muzaffarnagar is 24.2°C. The highest and lowest temperatures ever recorded in Muzaffarnagar are (73°F) on May 2022 and -0.9°C (30.4°F), respectively. The rainfall averages 915 mm. The driest month is November, with 8 mm of rain. Highest precipitation falls in July, with an

average of 261,4 mm. IQAC, Šhi Ram College, Muzaffarnagar

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### Statement of Assurance

The audit has been conducted in accordance with the standard procedures for the professional practice of internal auditing.

In our professional judgment, sufficient and appropriate audit procedures were completed and evidence gathered to support the accuracy of the conclusions reachedand contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit with the established area.

### Methodology of Audit

In order to meet its objectives, this audit combined physical inspection with review of relevant documentation and interactions with departmental staff members and students.

- Review of the Documentation: For the purpose of this audit, green audit framework was reviewed.
- Interviews: Interviews were conducted with the principal, departmental faculties and students.
- Physical Inspection: The audit team was conducting physical
  observation in the collegecampus to inspect the green practices.

Co-cydinator IQAC: Shri Ram College, Muzaffarnagar

Chairman IQAC. Shri Ram College, Muzaffarnagar

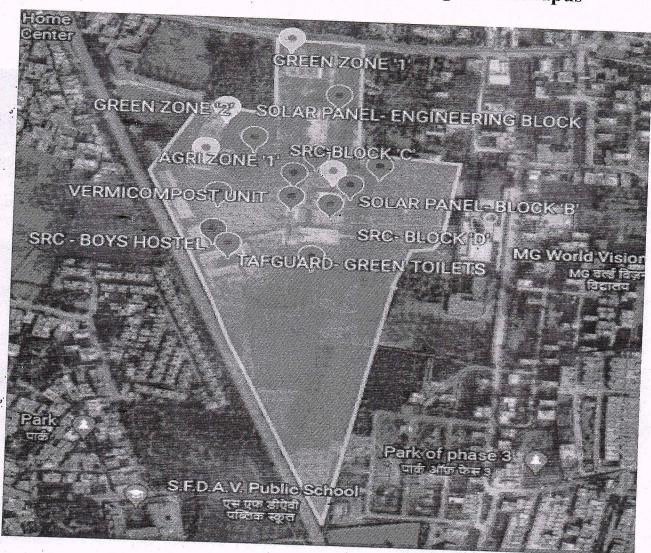
### **Summary of Findings**

The main findings of the audit show that, all the department staff and students are aware about the needed for environmental protection at a general level. It was also observed that a number of best practices such as maintaining the collection of waste separately, introduce rain water harvesting to new building structures, installation of solar panels for energy conservation, Control of vehicular movement in campus by rumble strips, speed bumps and barricading, symbols and signs (energy conservation, save environment, save water) in campus zone, implementing plastic free campus etc. are followed in the college premises.

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Chairman RQAC, Shri Ram College, Muzaffarnagar

# Google Earth View of SRGC Integrated Campus



#### Index

- Green Zones
- Agri Zones
- Solar Panel (Energy Management)
- Vermi-compost and Gaushala (Waste Management)
- Bio-Toilets
  Co-Ordinator
  IQAC. Shri Ram College,
  Muzaffarnagar

IOAC, Shri Ram College, Muzaffarnagar The College is located at Muzaffarnagar city (Delhi NCR), 114 km from Delhi. The region in which the College is located has rich geographic, climatic and cultural diversity. The climate varies from tropical in the northern parts. The average temperature varies from 6-14°C during winters to 37-41°C during summers. The average annual rainfall is 150 mm. The teaching programmes designed by various Academic bodies of the university are interactive, flexible and hands on; directed towards helping learners to gain the ability to confidence and effectively answer real life challenges. College also offers accommodation to about 923 students including scholars. A total of 03 Hostels have been built to accommodate the students, among which 02 are meant for boys and 01 for girls.

Colordinator
IQAC. Shy Ram College,
Muzaffarnagar

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## **Audit Framework and Detailed Findings**

The following audit framework is used for conducting Green Audit in 2018-19. The frame work also lists the finding and also observations for every criterion.

### Waste Audit

Criteria-1 (A): Waste Generation and Management

Objective: Maximize the waste recycled and minimize the quantity of non-recycled refuse.

Activity: Segregation of waste

Audit Observation: Waste Material is segregated as per category like Paper, Cardboard, Scrap Wood, Scrap Metal, Plastic scrap, glass, laboratory rags etc. Each waste is stored at departmental level and periodically sending to other purposes.

| Type of waste              | Audit Observation  |
|----------------------------|--|
| Paper Waste                | <ul> <li>One side rough paper is used for the printing of Notices, Time Tables etc. in each department.</li> <li>Waste papers are sending for shredding to prepare thread and card sheet.</li> <li>Email and Mobile media communication is used for minimize the use of paper.</li> </ul>  |
| Plastic waste  Glass Waste | Plastic bottles, caps and other waste material are stored separately at departmental level and sold as a scrap material  |
| Construction Waste         | <ul> <li>Empty chemical glass bottles are sending as a scrap material</li> <li>Construction waste is used for land filling and landscaping within the college premises.</li> </ul>   |
| Electrical Waste           | <ul> <li>Electrical waste like damaged electrical board, switches, cut wires are collect by electrician and replace this with new one and remaining wastage is sold as scrap.</li> <li>Electrical waste related to computer, key boards, and mouse is collected by Computer science department for repairing and replaces the damaged one and remaining wastage is sold as scrap.</li> </ul> |

Co-ordinator IQAC. Shri Ram College, Muzaffarnagar

Chairman IQAC. Shri Ram College, Muzaffarnagar

| dumped in landfills.  Used chemical waste is dumped in landfills.  |
|--|
|  |
| Waste from Hostel mess and canteen is used to make compost and manure in vermin-composting unit.  Solid waste is used as feed and fodder for cattle in Dairy farm. |
|  |

### Criteria- 1 (B): Waste Generation and Management Objective:

Collection of Waste Activity: Students as well as faculties of different department concern about waste collection. They do not throw the paper waste in the surrounding premises of collegecampus.

Audit Observation: Proper dustbins are provided to each department. Also 2 large (Steel and plastic) dustbins are install at various location in the college campus for collection of waste including administration office, college canteen, near garden etc. Some dustbins are provided to Boy's hostel (1 dustbin for 2 rooms) for collection of solid waste. The stored waste is collected by Municipal Corporation on everyday basis.



Cyairman IQAC. Shri Ram College. Muzaffarnagar

Dustbins in the Campus

Muzaffarnagar

Co-ordinatWaste Audit Lab IQAC, Shri Ram College, Muzaffarnagar Criteria- 1 (C): Waste Generation and

ManagementObjective: Plastic free Campus.

**Activity:** Motivate students about harm of plastic carry bags and items to convincethem for no use of plastic in college premises.

Audit Observation: To aware all students as well as faculties of different department about "No Use of Plastic" in college campus, awareness boards are display at various location in the college campus.

Criteria- 1 (D): Waste Generation and Management

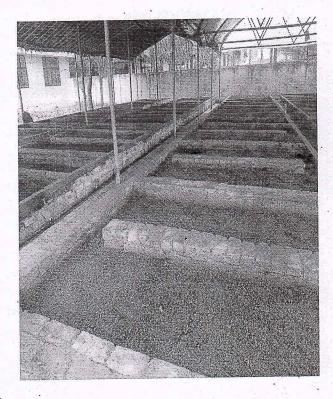
Objective: Management of Garden Waste and Kitchen Waste

Activity: Installation of Vermi-compost unit and Gaushala with the help of IPR & ED cell Audit Observation: The collected wastes from garden, debris, leaf latter are collect dumped into vermicomposting unit to prepare the compost manure from the waste. Eisenia foetida species of earthworm is used for the process. Kitchen waste is collected as used as feed and fodder for cattles in Gaushala.

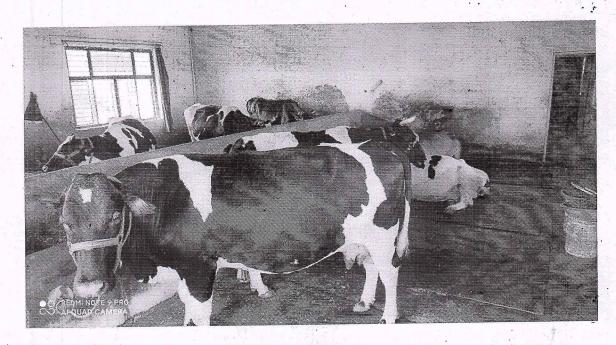
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Working Vermi-Compost Unit



View of Gaushala

Co-ordinator IQAC, Shu Ram College, Muzaffarnagar

Chairman NOAC. Skri Ram College, Muzaffarnagar

### Recommendations (Criteria 1):

- · Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, colored and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.

· Single sided paper to be used for writing and photocopy.

• Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.

Criteria- 2 (A): Water conservation

Objective: Water conservation.

Activity: Rain Water Harvesting

Audit Observation: Rain water harvesting facility is provided to main building and new COE buildings. Block 'A' and Block 'B' collets rain water in cemented water tanks (20000 liter capacity) and use this water for practical, washing and other departmental purpose. A soak pit is constructed in open ground where the roof water is lain down for water conservation.





Co-ordinator IQAC: Shri Ram College, Muzaffarnagar

Digital Underground Water Level Recorder

Chairman ICAO Shri Ram College,

#### Water Audit

(Academic Year 2022-23)

#### Water User Profile:

Water User Includes students, staff, visitors etc.

- a. Total number of water users: 2000 (Daily average)
- b. Number of Employee: 236 (Daily average)
- c. Number of students: 2178 (Daily average)
- d. Number of visitors (Daily Average Basis): 100
- e. Average working days: 06
- f. College timings: 9:00 AM to 5:00PM
- g. Rain water harvesting system availability: Yes
- h. Is rain water harvesting system working? Yes
- Total submersible Pumps (Ground Water): 07Assessment of water requirement

| Sr. | Site                                  | Total             | M                                   | easurement (                           | of water Use                              | s (Daily)               |                         |
|-----|---------------------------------------|-------------------|-------------------------------------|--|---|-------------------------|-------------------------|
| No. |                                       | No. of<br>Sources | Rate of<br>Discharge<br>(Liter/min) | Average<br>Duration<br>of Use<br>(min) | Average<br>Quantity<br>per use<br>(liter) | No. of<br>Uses<br>(No.) | Total Daily Use (liter) |
| (1) | (2)                                   | (3)               | (4)                                 | (5)                                    | (6)                                       | (7)                     | (8)                     |
| 1.  | Urinals                               | 92                | 0.5                                 | 1.00                                   | 0.5                                       | 2000                    | 1000                    |
| 2.  | Toilet/WC                             | 255               | 0.80                                | 5.00                                   | 4.00                                      | 500                     | 2000                    |
| 3.  | Laboratory'                           | 23                | .03                                 | 05                                     | 15  | 55·                     | 825                     |
| 4.  | Canteen                               | 3                 | . 05                                | 225                                    | 800                                       | 03                      | 2400                    |
| 5.  | Garden                                | 32,935<br>Sq.M.   | 04                                  | 01                                     | 04  | 32,935                  | 131740                  |
| 6.  | Other<br>(Drinking<br>purpose withRO) | 18                | 0.50                                | 10                                     | 05  | 2300                    | 11500                   |
|     | TOTAL                                 | •                 |                                     |  |   | . (                     | 149465                  |

IQAC. Shri Ram College, Muzaffarnagar IQAC. Shri Ram College. Muzaffarnagar

### Water Storage:

Water from our submersible pumps is directly pumped to the overhead tank and direct groundwater is used for gardening and irrigation purposes.

# Details of the storage structures:

| Storage Tanks | Capacity<br>(Liters) | Number | Number of times it is topped (or filled) daily | Average time of water inflow | Flow rate of water inflow |  |
|---------------|----------------------|--------|--|------------------------------|---------------------------|--|
| Overhead 1    | 20000                | 07     | Once a day                                     | 4 hrs 30 min                 | 275 lit/ min              |  |
| Overhead 2    | 2000                 | 05     | Once a day                                     | 15 min                       |                           |  |
| Overhead 3    | 1000                 | 18     | Once a day                                     | · 05 min                     | 275 lit/min               |  |
| Overhead 4    | 500                  | 04     | Once a day                                     |                              | 275 lit/min               |  |
| l'otal l      | 23500                | 28     |  | 4 min                        | 275 lit/miņ               |  |
| · •           | 23300   28           |        | Once a day                                     | 4 hrs 57 min                 | 1100 lit/min              |  |

### Water losses:

| Sr.<br>No. | 0,00                                | Total No. of    | Measurement of water uses (Daily)  |                                 |                     |
|------------|-------------------------------------|-----------------|------------------------------------|---------------------------------|---------------------|
|            |                                     | Sources         | Rate of Discharge<br>(lit in hour) | Daily loss<br>(4) x 24<br>(lit) | Total Loss<br>(lit) |
| (1)        | (2)                                 | (3)             | (4)                                | (5)                             | (6)                 |
| . 1        | Urinals                             | 92              | 0.20                               | 4.80                            | (6)                 |
| 2          | Toilet/WC                           | 255             | 0.5                                | 12 .                            | 47                  |
| 3          | Laboratory                          | 25              | 0.5                                | 12                              | 72                  |
| . 4        | Kitchen                             | 3               | 2.0                                | 48                              | 48                  |
| 5*         | Garden                              | 32,935<br>Sq.M. | 0.25                               | 6.0                             | 43568.13            |
| 6          | Other (Drinking<br>Purpose with RO) | 18              | 0.20                               | 4.80                            | 4.80                |
| Total      |                                     |                 |                                    |                                 |                     |
|            |                                     |                 |                                    |                                 | 43773.63            |

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Chairman IQAC. Shri Rám College, Muzaffarnagar Criteria- 2 (B): Water conservation

Objective: Water Saving.

Activity: Water Audit

#### **Audit Observation:**

 The storage (overhead/underground tank) checked periodically for any leakage.

 The departmental Tap was checked periodically to prevent from any leakage.

· The leakage Tap replace by new one.

### Recommendations (Criteria 2):

 Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale reuse and recycle of water system is necessary.

• Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage are regularly serviced and the wastage of water is not below the industry average for such equipment's used in similar capacity.

• Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH)regulations

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### **Energy Audit**

(Academic Year 2022-23)

As per the Energy conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiently with cost benefit analysis and an action plan to reduce energy consumption".

There are three phases of Energy Audit

- 1. Pre audit phase
- 2. Audit phase
- 3. Post audit phase

Above phase include following stages

- 1. **Data Collection** In preliminary data collection phase, exhaustive data Collection was performed using different tools such as observation survey communication with responsible persons and measurement. Following steps were taken for data collection:
  - The tam went to each department, center, library, cafe etc.
  - Data about the general information was collected by observation and interview.
  - The power consumption of appliances was recorded by taking an average value in some cases.
- 2. **Data Analysis** Detailed analysis of data collected include: calculation of energy consumption, analysis of latest electricity bill of the campus understanding the tariff plan provided by the Paschimanchal Vidyut Vitran Nigam Ltd. Data related to water usages were also analyzed using appropriate methodology.

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IQAC. Shri Ram College, Muzaffarnagar 3. **Recommendation** - On the basis of results of data analysis and observation, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of diesel in generator has to be reduced for the sake of good environment. The above target areas particular to the college was evaluated through a schedule for the collection. The formats of these are given below:

#### 3.1.Pre audit Phase

- 3.1.1. Survey Form for data collection
- a. List ways that you use fuel in your college. (electric stove, kettle, microwave, LPG, firewood, diesel and others).
- b. Electricity bill amount for the last five years.
- c. Amount paid for LPG cylinders for last one year.
- d. Weight of firewood used per month and amount of money spent?

  Also mention the amount spent for petrol/diesel/others for generations?
- e. Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.
- f. How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month.
- g. How many LED tube lights and lamps has your college installed? Mention use (Hours used/day for how many days in a month).
- h. Energy used by each bulb per month? (for example- 60-watt bulb x 4 hours x number of bulbs = kwh).
- i. How many LED bulbs are used in your college? Mention the use (Hours used/day for how many days in a month).
- j. Energy used by each bulb per month? (kwh).

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- k. How many fans are installed in your college? Mention use (Hours used/day for how many days in a month).
- 1. Energy used by each fan per month? (kwh).
- m. How many air conditioners are installed in your college? Mention use (Hours used/day, for how many days in a month).
- n. Energy used by each air conditioner per month? (kwh).
- o. How may electrical equipments are installed your college?
- p. Mention the use (Hours used/day for how many days in a month).
- q. Energy used by each electrical equipment per month? (kwh).
- r. How many computers are there in your college? Mentioned the use (Hours used/day for how many days in a month)
- s. Energy used by each computer per month? (kwh)
- t. How many photocopiers are installed by your college? Mention use (Hours used/day for how many days in a month).
- u. How many inverters your college installed? Mentions use (Hours used/day for how many days in a month)
- v. How many cooling apparatuses are in installed in your college?

  Mention use (Hours used/day for how many days in a month)
- w. Energy used by each cooling apparatus per month? (kwh) Mention use (Hours used/day for how many days in a month)
- x. Energy used by each photocopier per month? (kwh) Mention the use (Hours used/day for how many days in a month).
- ý. Energy used by each inverter per month? (kwh)
- z. How many electrical equipment are used in different labs of your college? Mention the use (Hours used/day for how many days in a month)

aa. Triergy used by each equipment per month (kwh)
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- bb. How many heaters are used in the canteen of your college? Mention the use (Hours used/day for how many days in a month)
- cc. Energy used by each heater per month? (kwh)
- dd. No of street lights in your college?
- ee. Energy used by each street light per month? (kwh)
- ff. No of TV in your college and hostels?
- gg. Energy used by each TV per month? (kwh)
- hh. Any other item that uses energy (Please write the energy used per month) Mention the use (Hours used/day for how many days in a month)
- ii. Are any alternative energy sources/nonconventional energy sources in photovoltaic cells in your college? specify
- jj. Do you run "switch off" drills at college?
- kk. Are your computers and other equipment put on power-saving mode?
- Il. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby mode most of the time? If yes, how many hours?
- mm. What are the energy conservation methods adapted by your college?
- nn. How many boards displayed for saving energy awareness?
- oo. How much ash is collected after burning fire wood per day in the canteen?
- pp. Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Criteria-3 (A): Energy Consumption (Electrical Energy)

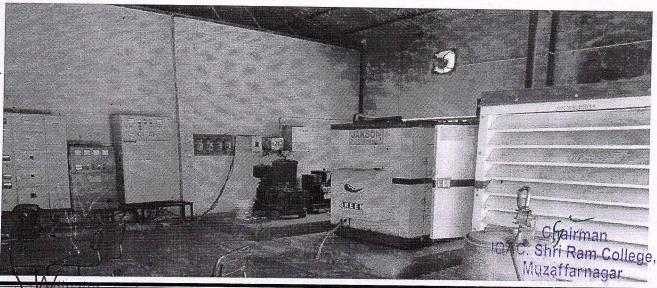
Objective: To save the electrical energy.

IQAC. Shri Ram College, Muzaffarnagar Chairman IOAC, Shri Ram College, Muzaffarnagar Activity: Installation of "Solar Panels".

#### **Audit Observation:**

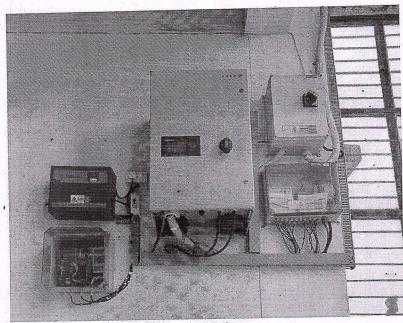
Energy source utilized by all the departments and common facility centre is electricity only. Total energy consumption is determined per day 200 KW and annually 2400 KW in 1 year by major energy consuming equipments.

Understanding the importance of energy conservation Shri Ram College, in the year 2017, took an initiative and installed Rooftop Solar Panels in the campus producing 160 Kilo Watt of electricity. The reason behind this is to take a bigger step towards environmental protection. We have taken lot of energy initiatives and our managing committee approved a 160 KW Rooftop Solar Panel System worth Rs. 1.05 crore. The area covered by this solar panel system is 3562.37 square meter which results in 22.26 square meter/KW. The average production of electricity by this system is 960 KW per day and 350400 KW per year. The configuration of this solar Rooftop system depicts >300 Wp PV modules and string inverter of 160 KWP. They operate with a free resource and do not produce greenhouse gas emissions when converting sunshine to electric power.



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### **Electricity Generator Room**



**Solar Inverter and Metering** 



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Solar Panel Installation

Chairman IOAC, Shri Ram College Muzaffarnagar

### Consolidate Shri Ram College, Muzaffarnagar Details of Unit, & Bill, Amount, July 2022-June 2023

| S.No. | Month     | Units       | Bill Amount |
|-------|-----------|-------------|-------------|
| . 1   | July      | 12137.322   | 352824      |
| 2     | August    | . 12860.104 | 310506      |
| 3     | September | 14257.114   | 352248      |
| 4     | October   | 11321.953   | 357462      |
| 5 .   | November  | 6669.910    | 303915      |
| 6 *   | December  | 11271.712.  | 302293      |
| 7     | January   | 8989.529    | 276318      |
| 8     | February  | 17151.858   | 243216      |
| 9     | March     | 19825.953   | 210115      |
| 10    | April     | 22934.768   | 169989      |
| 11    | May       | 16969.619   | 250742      |
| 12    | June      | 15627.199   | 343826      |
|       | Total     | 170017.041  | 3473454     |

- Electricity Charges Rs. 289454.00 /month
- ♦ Number of Generators = 2(163KVA & 83 KVA)
- ❖ Cost of generator fuel = Rs 25000/month
- Total cost of energy = Rs314454.00/month.

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- ❖ Number of LED Tube = 859
- ❖ Number of LED ceiling lights = 201
- Arr Number of fans = 476
- ♦ Number of Air conditioners = 74(132kW)
- ❖ Number LED fours lights = 112
- ❖ Total Electrical Equipment's in Lab = 130
- ightharpoonup Number of Photocopiers = 4
- ❖ Number of Televisions = 9
- ❖ Number of Printers = 42
- \* Energy generation by solar panels 180 kW

Criteria- 3 (B): Energy Consumption (Electrical Energy)

Objective: To save the electrical energy.

Activity: Installation of LED lights/ lamps at major locations in campus

and laboratories.

### **Audit Observation:**

All the departments and common facility centers are equipped with LED tubes, Lamps, Fans, coolers and AC, Central AC etc. Equipments like Computers are used with power saving mode. Also, campus administration runs switch –off drill on regular basis. In science department like Physics, Chemistry, Biotechnology, Electronics, Computer Science, Botany and Zoology electricity was shut downed after occupancy time is one of green practices for energy conservation.

Criteria- 3 (C): Energy Consumption (Electrical Energy)

Objective: To save the electrical energy.

IQAC, Shri Ram College, Muzaffarnagar Chairman IQAC, Shri Ram College. Muzaffarnagar Activity: Conservation of Electrical Energy at Departmental Level

### 'Audit Observation:

- All laboratory having panel boards MCB switch to control the electrical supply within the department. The responsibility is given to non-teaching staff to "Switch-off" this switch without any ignorance to avoid the wastage of electrical energy.
- Sign boards like "Switch off the fans / light when not in use" are displayed in the departments.

• The water pumps are regularly maintained for minimum consumption of electricity.

• Solar panel system is installed for entire college campus.

• LED lamps, LCD monitors, Branded fans are used to minimize the consumption.

### Energy substitution (Electrical Energy to Solar Energy)

As we know in our campus there is a huge consumption of electrical energy which is not economical so instead of using electrical energy we switch to alternate energy source which is solar energy.

The major energy consumption units are main building and management block, so we have shown the calculation for the no of solar panels for these buildings only.

Cost analysis of solar panel for

Total Capacity - 160 kWp

Production Output
 465 Units/ Day

• Life of Solar Panels - 25 years

• Life of Inverters - 5 years

• Total Cost of Installation - Rs. 85,70,000.00

• Subsidy Amount - Rs. 25,70,000.00

• Net Cost - Rs. 60,00,000.00

• Cost per Watt - Rs. 37.50

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- 13974 Total Generation per month

- Rs. 142534.80 Generation Value

- Rs. 17,10,417.60 Annual Saving

- 5 Years Payback Period

### **Consolidation of Audit Findings**

- The communication process for awareness in relation to energy conservation is found adequate.
- Average power factor of 1.0 is maintained
- Assessment of electrical load calculation has been done by the college.
- Monthly use of electricity in the college is not very high.
- Objectives for reducing energy, water and fuel consumption are sufficient.
- Energy efficient equipments are being used by replacing the old nonenergy efficient fans.
- Regular monitoring of equipment's and immediate rectification of any problems in being done.

Criteria- 4: Energy Consumption (Transportation)

Objective: To save the fuel energy.

Activity: Motivate to students and faculties for reduce the use of vehicles in college campus.

Audit Observation: Every Saturdays of each month is declared as a "No vehicle day" by college authority to minimize the use of personal vehicles with in the college campus. To motivate and aware the students regarding minimum use of vehicles "Cycle Day" programme is arranged by college faculty.

AC. Shri R. College, Consumption (LPG Cylinder) and IGL Connection affa

Muzaffarnagar ·

Objective: To save the LPG energy

Activity: Conserve the LPG at departmental Level

#### **Audit Observation:**

- The gas burners, tubes are checked periodically to prevent the leakages of gas.
- Slow flame is adjusted during the practical work to minimize the excess use of gas.
- The practical is listed as per use and non use of LPG
- The empty cylinder is stored centrally and labeled as "EMPTY"
- The use and requirements of each department about LPG is monitored by controlling sheetand send to office.

Criteria-6: Cyber Waste Generation Objective: To minimize E-waste

Activity: Proper disposal of E-waste generated

**Audit Observations:** 

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

### Recommendations (Criteria 3-6)

• Recycle or safely dispose of white goods, computers and electrical appliances pater

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- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and available.

## **Green Campus Initiative Activities**

Criteria- 7: Green Campus

Objective: To increase the Green Cover within the college campus.

Activity: Establishment of lawns and gardens, Plantation programmes,

Shade Net House

#### **Audit Observations:**

The college campus is covered with the various species of the plants and maintained by the gardener all time. The varieties includes *Melia azedarach*, *Populus*, *Neolamarckia Kadamba*, *Delonix Regia*, *Tectona grandis*, *Toona ciliata*, *Pine*, *Cycas*, *Maulsari*, *Ficus*, *Eucylyptus*, Jade Plant, *Casaurina*, Pistol Palm, Areca palm, *Platycladus orientalis*, Rudraksh, Silver Oak, *Bismarckia Palm*, *Raphis Palm*, *Sapodilla*, Mango, Monkey Jack, Litchi, Guava, Java Plum, *Sideroxylon inerme*, *Murraya Paniculata*, *Crepe jasmine*, *Peace Lily*, *Hibiscus*, Rose, Bamboo etc. and many other medicinally important plant such as Shatavari, Bakayan, Harsingar, Aak, Patthar chatta, Karipatta, Lemongrass, Doob ghaas, Calendula and Sadabahar etc. Campus also has several indoor plants including Ficus removes (formaldehyde, & benzene), Spider plants (carbon mono oxide, benzene & trichloroethylene), Snake plants, Bamboo palm, Rubber plant, chrysanthemum, Peace lily, & Gerbera etc. In point of view of importance of the assessment, zones were divided as:

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar Chairman IQAC. Shri Ram College, Muzaffarnagar Green Zone '1': (Includes Block 'A', From Main Gate Entrance to Block

'B' Internal Gate Entrance, Parking Area)

No. of trees: 80

No. of Plants: 700

Grass Lawn Area: 6200 sq. m.

Haze Area: 2575 sq. m.

Green Zone '2': (Includes College of Technology, College of Architecture,

Boys Hostel)

No. of trees: 470

No. of Plants: 1425

Grass Lawn Area: 2405 sq. m.

Haze Area: 3652 sq.m.

Green Zone '3': (Includes Block 'B', 'C', 'D', Playground and Shri Ram College)

No. of trees: 172

No. of Plants: 905

Grass Lawn Area: 24,585 sq.m.

Haze Area: 654 sq.m.

Green Zone '4': (Includes Block 'G', In Front Agriculture, Shri Ram College)

No. of trees: 102

No. of Plants: 307

Grass Lawn Area: 1585 sq.m.

Haze Area: 2354 sq.m.

Agriculture Zone '1': (Behind of Block 'G', 'E')

Crops Grown: Rice, Vegetables, Herbs and Wheat

Area: 1.5 Acre

Agriculture Zone '2': (Behind Block 'C', 'D' and Shri Ram College )

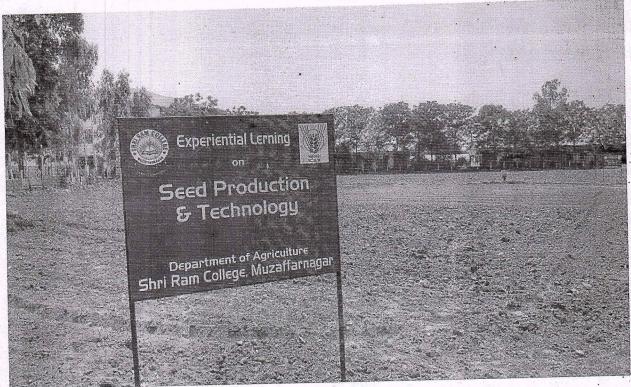
Crops Grown: Seed Production

Area: 3 Agre IQAC. ShirRam College, Muzaffarnagar

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IO/ C. Shri Ram College, Muzaffarnagar

Area: 3 Acre

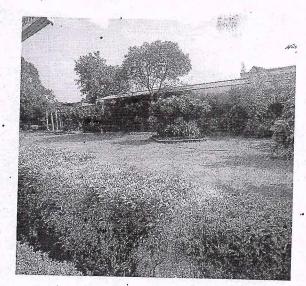




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**Seed Production Technology** 

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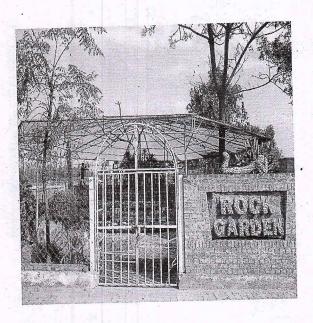




Green Spaces and Parks in SRC

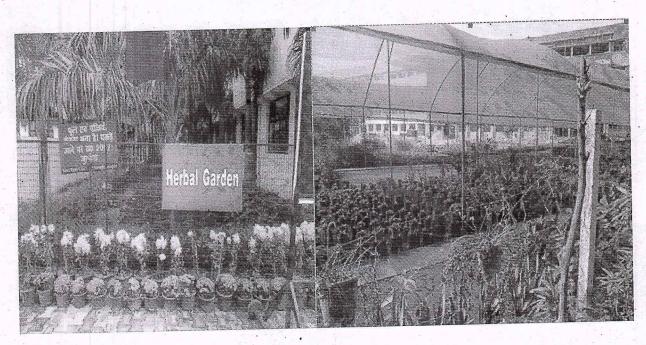
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Rock Garden with Xerophytes communities ...



Glimpses of Lead Herbal and Botanical Garden in the College

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**Mushroom Cultivation in SRC** 

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Chairman IQAC. Shri Ram College, Muzaffarnagar Table: List of Fauna in SRGC (integrated campus)

| N          | ZOOLOGICAL NAME             | COMMON NAME                   | FAMILY           |
|------------|-----------------------------|-------------------------------|------------------|
| ANA        | MALS                        |                               |                  |
|            | ESTIC TYPE                  |                               |                  |
|            | Felis catus                 | Domestic Cat                  | Felidae          |
|            | Sus scrofa                  | Pig                           | Suidae           |
|            | Canis lupus                 | Dog                           | Canideae         |
|            | Capra aegagrus hircus       | Goat                          | Bovidae          |
| j.         | Pteropus giganteus          | Indian Fruit Bat              | Ptero pod i da e |
| 2.<br>3.   | Equus caballus              | Khachhar/Mule                 | Equidae          |
| 7.         | Bubalus bubalis             | Buffalo                       | Boviđae          |
|            | TYPE                        |                               |                  |
| 8.         | Herpetes edwardsii          | Nevala                        | Herpestidae      |
| ğ.         | Boselaphus<br>tragocamelus  | Neelgal                       | Bovidae          |
| LÓ.        | Funambulus pennantii        | Gilhari                       | Sciuridae        |
| 11.        | Lepus nigricollis           | Khargosh                      | Leporidae        |
| 12.        | Aattus rattus               | Chuha                         | Muridae          |
| 13.        | Pteropus giganteus          | Indian Fruit Bat              | Ptero pod idae   |
| 14.        | Semnopithecus entellus      | Langur                        | Cercopethicidae  |
|            | TILES                       |                               |                  |
| 16.        | Ptyas mucosus               | Common rat snake / Dhaman     | Colubridae       |
| 17.        | Bungarus caeruleus          | Common Indian<br>Krait        | Elapidae<br>     |
| 18.        | Hemidactylus<br>maculates   | Rock Gaeko                    | Gekkonidae       |
| 19.        | Chamaleo chamaleons         | Chameleon                     | Gekkonidae       |
| 20.        | Hemidactylus brooki<br>gray | Chipkali                      | Gekkonidae       |
| AMI        | PHIBIANS                    |                               |                  |
| 21.        | Rana tigrina                | Common Frog                   | Ranidae          |
| 22.        | Bufo bufo                   | Toad                          | Bufonidae .      |
| INS        | ECTS                        |                               |                  |
| 23.        | Eurema hecabe               | Common grass yellow butterfly | Pieridae         |
| 24.        | Delias eucharis .           | Common jezebel                | Pieridae :       |
| 25.        | Acheta domesticus           | Jhingur/Cricket               | Gryllidae        |
| 26<br>lege |                             | Honey Bee                     | Apidae C         |

Co-ordinator 26, 10AC. Shri Ram College, Muzaffarnagar

## Table: List of Avi Fauna in SRGC integrated campus

| S.<br>No. | ZOOLOGICAL NAME        | COMMON<br>NAME         | FAMILY        |
|-----------|------------------------|------------------------|---------------|
| 1.        | Achridotherus tristris | Common Myna            | Stumidae      |
| '2.       | Corvus spiendens       | Crow                   | Corvidae      |
| 3.        | Eudynamys scolopaceus  | Koel                   | Gugulidae     |
| 4.        | Psittacula krameri     | Parrot                 | Psittaculadae |
| 5.        | Pycnonotus cafer       | Bulbul                 | Pygnonotidae  |
| 6.        | Saxicoloides fulicatus | Robin                  | Muscicapidae  |
| 7.        | Ploceus philippinus    | Baya Weaver            | Ploceidae     |
| 8.        | Coturnix coturnix      | Quall                  | phasianidaese |
| 9.        | Picideae               | Wood pecker            | Picidae       |
| 10.       | Vanellus indicus       | Red Wattled<br>Lapwing | Charadriidae  |
| 11.       | Columba livia          | Pigeon                 | Columbidae    |
| 12.       | Passer donnesticus     | Sparrow                | Passeridae    |
| 13.       | Luscinia megarhynchos  | Nightingale            | Muscicapidae  |

## Recommendations (Criteria 7):

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- · Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this, Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5<sup>th</sup> June as 'Environment Day' and plant trees on this day to make the campus Greener.

Plant exhibition arranged regularly in college campus. IQAC, Shri Vam College.

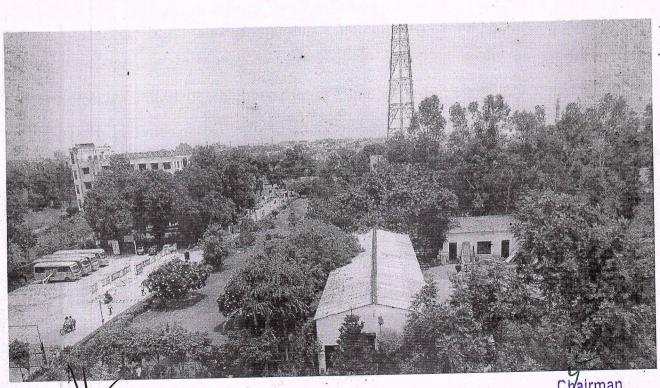
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Shri Ram College Playground



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Shri Ram College Lawn at Entrance

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Shri Ram College Block "B"



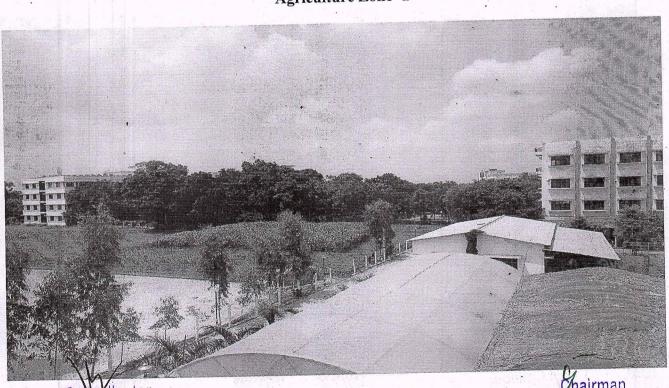
Colordinator IQAC. Shir Ram College, Muzaffarnagar

Open Art Studio of Shri Ram College •47

IQAC Shri Ram College, Muzaffarnagar



Agriculture Zone '1'



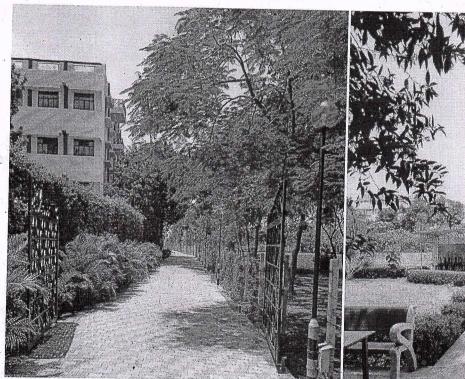
Co ordinator IQAC, Shri Ram College, Muzaffarnagar

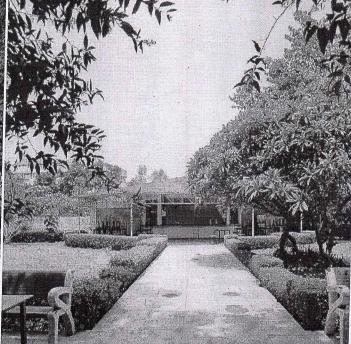
**Backside View of Green Campus** 

Chairman IQAC, Shri Ram College, Muzaffarnagar



Agriculture Zone '2'





Pavement

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Canteen

Chairman ICAC, Shri Ram College, Muzaffarnagar

## GREEN CAMPUS INTIATIVE ACTIVITIES

## A. TREE PLANTATION IN CAMPUS

Tree plantation is the major tools to control the air pollution and maintain the environmental balance.

It is found that one fully grown trees absorbs 6.8 kg carbon dioxide CO<sub>2</sub> at the same time it gives oxygen gas more than 6.8 kg. It shows the importance of plantation and conservation of trees.



Tree Plantation at Shri Ram College

Every year planted trees growing responsibility and conservation of that plant is given to each volunteer of the NSS. After plantation each volunteer take the responsibility of one plant of its care. NSS unit organized environmental awareness programmes time to time. During the festival season the volunteer creates the awareness among the people to stop or reduce the water pollution, noise and air pollution.

Co-oxilizator IQAC. Shri Ram College, Muzaffarnagar Chairman IOAC, Shri Ram College, Muzaffar nagar

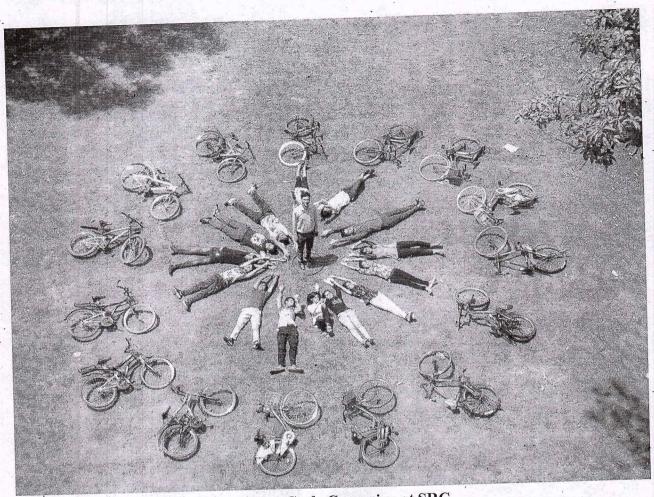




Tree Plantation by the students at Shri Ram College

Co-orginator IQAC. Shri Ram College, Muzaffarnagar

Charman 1040: Shri Ram College, Muzaffarnagar



Green Cycle Campaign at SRC

## B. SURVEY OF VEHICLES AND CARBON FOOTPRINT .

Air pollution is one of the serious environmental concerns of the urban cities where majority of the population is exposed to poor air quality. The rapid urbanization in India has resulted in a tremendous increase in the number of motor vehicles. As the number of vehicles continues to grow and the consequent congestion increases, vehicles are now becoming the main source of air pollution in urban India. The country has taken a number of measures for the improvement of the air quality in cities. These include the improvement in the fuel quality, formulation of necessary legislation and enforcement of vehicle emission standards, improved traffic planning and management, etc.

Autômotic externicles emit several pollutants depending upon the qual IQAC, Shri Ram College, Muzaffarnagar

Muzaffarnagar

they consume and engine efficiency. The emission of pollution from the car also includes the leakage of fuel and resources and the level of emissions, depending on the type of car, its maintenance, etc.

The major pollutants released as vehicle/fuel emissions are, carbon monoxide (CO), nitrogen oxides (NOx), photochemical oxidants, air toxics, namely benzene (C6H6), aldehydes, 1,3 butadiene (C4H6), lead (Pb), particulate matter (PM), hydrocarbon (HC), oxides of sulphur (SO2) and polycyclic aromatic hydrocarbons (PAHs). While the predominant pollutants in petrol/gasoline driven vehicles are hydrocarbons and carbon monoxide, the predominant pollutants from the diesel-based vehicles are Oxides of nitrogen and particulates.

Staff members and students uses the number of vehicles for the transportation. These cause pollution.

But to overcome this big problem of pollution college has adopted the systematic policy of transportation. The most of students are from outside of the town and they use the public transport for the transportation. Student from the town preferred the use of bicycle mostly the girl student's used bicycles. As the college is near to the bus stand student used to walk to college. Staff members of the college and visitors use the cars or bikes or auto rickshaw and some staff member use bicycles.

To manage the transportation system, the college has implemented policies such as requiring college employees to use the sharing transportation system. Colleges have taken another step toward reducing their carbon footprint by celebrating a vehicle-free day on which students and staff members use the state transportation system.

### 1. ABSORPTION OF CARBON

The economic value of a fully grown tree in terms of oxygen producing capacity is nearly equal to Rs 23.72 Lacs per year, according to a report by NGO DELHI GREENS. The claim is based on facts that an average adult at rest inhales nearly 7-8 litres of all per minute, or about 11,000 litres per day, of which about 20% in axygen Muzaffarnagar

and nearly 15% is exhaled, according to the NGO "economic valuation of oxygen supplying ecosystem service of healthy tree." Every day, humans consume about 550 litres of pure oxygen. According to a market survey, the average cost of 2.75 portable oxygen cylinders is Rs. 6500, and humans consume oxygen worth Rs. 6500 at this rate about rupees 13 lakhs per day.

By taking some consideration the following numbers cones out,

- Number of full-grown Trees in campus=600.
- Carbon absorption capacity of 600 trees=carbon emission during run of 25,000miles.25,000 miles = 40223.6km
- Petrol / Diesel consumes by a Vehicle for 40233.6 km= 2011.68ltr.
- The carbon emitted by a Vehicle by consumption of 01 ltr of diesel is 2.68kg.
- Thus, carbon emitted by 2011.68 ltr is 5391.30 kg (2011.68 lts x 2.68kg)

Amount of carbon absorbed by the one full grown tree is 5391.30 kg/600 = 8.9855.

## Absorption of carbon dioxide:

As the college campus having number of plants, trees. The huge amount of carbon dioxide is absorbed and converted in oxygen.

• College campus having 600 full grown trees there it absorbs (600 x 8.9855) = 5391.3kg CO2 or **5.3913tons** 

• College campus having 2793 semi grown plants, flowers and 40,000 sq. m. of

Leaven Bush area (equivalent to 50 semi grown plant), therefore it absorbs one

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third of full-grown trees  $(2793 \times 2.9952 \text{ kg}) = 8365.5936 \text{ kg CO2}$  or **8.365 tons.** 

Total Absorption of Carbon dioxide = 5.3913 + 8.365 = 13.7563 Tons

## 2. Oxygen emmission in Campus:

According to the growing air foundation,

- Trees renew our air supply by absorbing carbon dioxide and producing oxygen.
- The amount of oxygen produced by an acre of trees per year equals the amount consumed by 18 people annually. One tree produces nearly 260 pounds or 117.934 kg of oxygen each year.
- · One acre of tree removes up to 2.6 tons of carbon dioxide each year.
- Trees lower air temperature by evaporating water in their leaves.

Therefore, Total oxygen emitted by the 600 full grown trees is

 $(600 \times 117.934) = 70760.40 \text{ kg or } 70.760 \text{ tons}$ 

By the semi grown plants, lawns and bushes is about  $(2793 \times 39.311) = 109796.554 \text{ kg}$  or 109.796 tons

Total oxygen emitted by the campus greenery = 180.56 tons / per annum

A pilot study on organic waste separation behavior by households in collaboration with MIT, USA:

A high fraction of the total waste is organic waste. If this waste is separated at the Co-ordinator
IQAC: Shri Ram College,
Muzaffarnagar

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Muzaffarnagar

household level, there is potential for the waste to be utilized in organic waste technologies. A pilot study was designed and conducted in two neighborhoods in Muzaffarnagar, to test incentives to increase organic waste separation behavior by households. In collaboration of Massachusetts Institute of Technology, USA and Nagar Plaika Muzaffarnagar, the students of Bio Science department of SRC Development worked upon a project of "Decision Support Tool for Planning Municipal Solid Waste Management Systems".

Two neighborhoods of similar income levels, Gandhi Colony and Teachers Colony, were chosen as the test neighborhoods for the pilot study. In one neighborhood (Gandhi Colony), no feedback was given to the households on their waste separation quantities or separation rate. This neighborhood is known as the door-stepping neighborhood. In the other neighborhood (Teachers Colony), feedback was given to the households on a weekly basis for a period of one month. This neighborhood is known as the feedback neighborhood. Finally, an analysis of the benefits and costs of implementing a city-wide segregation policy in the city of Muzaffarnagar was calculated.

The participants distributed two bins (green and red) and one bag to the households free-of-charge and explained the new waste collection system. The bins were given free-of-charge to the households through a seed grant funded by the Tata Trusts. The awareness program was conducted in both Hindi and English and leaflets were handed out along with the two bins and bag kit.

Colordinator IQAC, Shin Ram College, Muzaffarnagar Chairman
Chairman
Chairman
Chairman
Muzaffarnagar



Shri Pankaj Aggarwal Chairman Nagar Palika Muzaffarnagar





कचरा प्रबन्धन की विधि Drsc Kulshreshtha Chairman Shri Ram Group of Colleges Muzaffarnagar



1, जैविक कचरा



2. सूखा कचरा

(अगर गंदे हो, साफ किया जाना चाहिए) प्लास्टिक कवर/बोललें/यक्से/ चिम्स /टांफी रंपर

कागज (अगर गेंद्रे हो, साफ किया जाना चाहिए) अखवार / पत्रिका स्टेशनरी / जंक मेत

प्जास्टिक/कागज क्य, प्लंद द्ध/दही पेक्ट

गसा डिटवे / पिज्जा वॉक्स टेट्रा पैक

धातु (अगर गदे हो, साफ किया जाना चाहिए) पन्नी कटेनर धातु के डिक्टे

<u>प्लास्टिक</u>

(केवल पुनः उपयोगी वैग का प्रयोग)



3. बेकार कचरा (प्लास्टिक वैग वन प्रयोग ना वन्रें)

सैनिटरी कचरा (अखबर में लपेटा जाना चाहिए) डायपर / सैनिटरी नैपकिल

नाम्बन टिश् पेप्र – (इस्लेमाल किया हुआ)

ते<u>जधार वाले पदार्थ</u> \*\* (अखनार में पैक करके अलग से सींपे, केवल कम मात्रा में ही)

समय सीमा समाप्त दवाएं, झाडू की धूल

पयोग में नाथी हुई सीरिंज

इंजेक्शन की बोतलं

पटिटयाँ कंडोम

(प्लास्टिक यैग का प्रयोग ना करें)

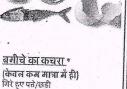
रसोई का कचरा सब्जी/फल के छिलके पकाया / बचा भोजन अंडे के छिलक चिकन/मछती व हड़िड्याँ सड़े फल/सहिज्यां भौजन के लिए इस्लेमाल किया गया दिशू पेपर, चाय वैग / कॉफी पाउडर पत्ने की प्लेटें

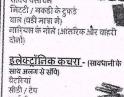


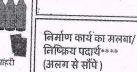
बगीचे का कचरा \* निरं हुए पते/छडी प्जा के फुल/माला, घास आदि



काँचे (देखशान के साथ) विना दूटा हुआ प्रसास जार / बोतने अन्य स्खा कचरा रवड / धर्माकोञ पुराने कपडे / प्रशा / स्पंज सौंदर्य प्रसाधन



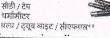






द्टे कोच (अखवार में लवेटा जाना चाहिए)





मुजफ्फरनगर पालिका परिषद्



2011W http://www.2bin1bag.in

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## 3. AWARENESS PROGRAMMES

To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our friends and family that the physical environment is fragile and indispensable, we can begin fixing the problems that threaten it.

A good course of action that ensures your continued participation is to pick an environmental issue that strikes you as the most urgent. The amount of environmental issues seems limitless, and while they are all important, it's easy to get overwhelmed. Thus, Shri Ram College time to time arranged such type of programmes in this session, some of the noteworthy are:

- 1. "NO POLYTHENE CAMPAIGN" with Muzaffarnagar District Administration
- 2. Best of WASTE Competition
- 3. World Environment Day
- 4. Plantation Programmes with NSS Unit time to time
- 5. International seminar of "Problem of Waste water" with Japan's Taf Guard JICA foundation.
- 6. Seminar on Waste Management
- 7. World Water Day

8. Green Cycle Campaign

IGAC. Shri Ram College, Muzaffarnagar Chairman

10/ Shri Ram College

Muzaffarnagar

## एनवायरमेंट-डे पर विभिन्न कार्यक्रम

श्रीराम ग्रुप आफ कालेजेज में वर्ल्ड एनवायरनमेंट-डे पर विभागों में कार्यक्रम आयोजित

♣ जनवाणी संवाध्याता गुज्रकाश्यमंद्र युष्यात को शीराम श्रुप आफ कालिकोज में कर्न्ड ध्यावस्त्रकोट हे 2024 के अवस्तर पर अलग-अस्ता विभागों हारा फर्न्ड ध्वज्यस्त्रकोट है-2024 के अवस्तर धर कार्यक्रम वार्योजित किये गरे।



गया। श्री राम सोलीज ऑफ इंजीन्सिंग के प्रांगण में यह कार्यक्रम साकारसम्बद्धा के स्वय प्रस्था हुआ जिसमें लाग-साकाजी ने अगनी भूमिका निवाई।

शीराण चॉलेज आफ इंजीनवारण गं दुषे कार्यक्रम का सुचाराण श्री राज जुल ऑफ कॉलेजेड, पुजयफरनगर के संस्थापक पेयरपेन, डा. एससी कुलबंड. संगय सर्वेज की अन्तर है। पूना रागे, संग्रम पूर ऑफ कॉल्फ्रोंस के निदेशक 2. दरवल चीटान, सीगा जीनेज की अजार्च डा. प्रेरण मितल और डीन डा. सुविज न्याची आदि ने संदुक्त रूप से दीग प्रज्ञाविता करके किया। महाविधालक प्रांरण में विधार्मियों हारा अपने कोशल की सभी के सम्मुख प्रस्तुत किया गया



जिसमें विद्याचित्रे द्वारा कनाये गये कोराज्य को सभी शिक्षको य आंत्रीययां ने श्वर वराहाः

विविधिया में मुख्य निर्णायक की भूमिका बीतम करिय की वाज्यका उन पूनम कार्य एवं वीतम करिया की प्राच्या डा. वेरम्य मितल ने निवार । इस अवसार पर बीतम पूप आफ कार्यिकेश के सम्मापक प्रेसपिन हा. एससी कुलब्रेष्ठ ने विद्याधियों को प्रश्नोता किया तथा उनकी प्रतिका की प्रश्नोता की। उन्होंने यह भी कहा कि भीवण्य में इस प्रकार के कार्यक्रम होते हतने चाहित। नाल्यात उन्होंने कार्य की प्रमाण पत्र तथा प्रतीक विद्य देश्वर सम्मानित किया।

### World Environment Day



International Seminar on "Problems of Waste Water Treatment"

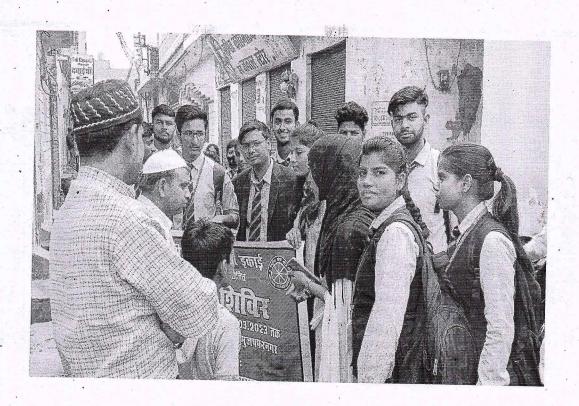
Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Charrman Shri Ram College,

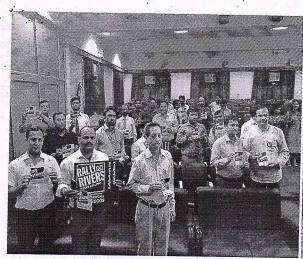


Japan's Taf Guard Technology Team at Shri Ram College

Co-ordinator IQAC. Shri Ram College, Muzaffar nagar Chairman IQAC. Shri Ram College Muzaffarnagar



Polythene Campaign by NSS Unit



Rally for Rivers



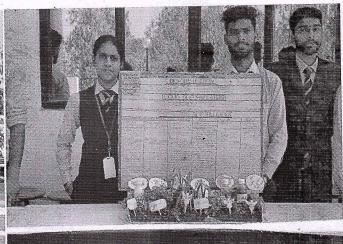
**Unnat Bharat Abhiyaan** 

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

IGAC, Shir Ram College, Muzaffar nagar



**Best Out of Waste Competition** 



Science Exhibition



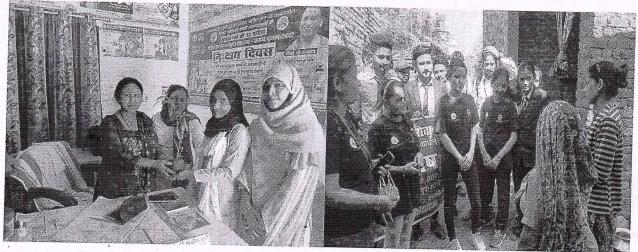
**National Science Day Celebration** 

Co-ordinator IQAC. Shri Ram College, Muzaffarnagar

(fairman IQAC. Shri Ram College, Muzaffarnagar



Tree Plantation by NSS volunteers of Shri Ram College



Swachh Bharat Abhiyaan

Water Awareness by students of SRC

Co-ordinator IQAC, Shri Ram College, Muzaffarnagar

Chairman IQAC. Shir Ram College, Muzaffarnagar



Gur Mahotsav (Promoting Herbal Jaggery



Water Level Indicator developed by SRT

Co-ordinator IQAC. Shri Ram College, Muzaffarnagar Chairman IQAC, Shri Ram College, Muzaffarnagar



Seminar on Taisei Soil System-Japan's Tafgard Technology



Co-ordinator IQAC, Shri Ram College Muzaffarnagar

JAPAN's Expert Team visit at Shri Ram College

CHamman Shri Ram College, vi zaffar nagar



Chairman Welcoming Japan's Team



Green Toilet Project

Co-ordinator ICAC. Shri Ram College, Muzaffarnagar Chairman IOAC. Shri Ram College Muzaffarnagar



MIT Seminar on "Waste Management System"

Co-orchator IQAC. Shri Ram College, Muzaffarnagar

Chairman Shi Ram College, Muzaffar nagar

#### **CONCLUSIONS**

Considering the fact that the institution is predominantly an undergraduate college, there is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial. The installation of solar panels, paperless work system and vermin- composting practices are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using eco friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development.

As part of green audit of campus, we carried out the environmental monitoring of campus includes Illumination, Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus well within the limit i.e. below 50 dB at daytime.

College authority forms a committee for the plantation program and environmental awareness, this committee continuously work throughout the year with the help of NSS student. College appointed NSS students for the awareness of tree plantation.

Co-ordinator ICAC, Shri Ram College, Muzaffarnagar Chairman IOAC, Shri Ram College. Muzaffarnagar The land is in a constant state of birth,
Giving life to all who live on Earth.
Our carelessness and fears
Have taken a toll over the years.
Her land is parched and scorched
As man continues to light the torch.
We continue a want of speed and ease,
All while our pesticides kill off our bees.
It's time to wake up and see Mother Earth's pain.
Humanity's selfishness is becoming insane.
Soon her cries will turn to gloom,
And man will cause its own doom.



Co-ordinator IQAC, Shri Ram College, Muzatrarnagar

Chairman IQAC, Shri Ram College Muzaffarnagar







# Certificate of Registration

## SHRI RAM COLLEGE

PARIKRAMA MARG, MUZAFFARNAGAR, U.P., INDIA

has been assessed and Certified by Otabu Certification Pvt. Ltd. as meeting the requirements of:

ISO 9001:2015 **Quality Management System** 

For the following scope of activities:

PROVIDING DEGREES IN COMPUTER APPLICATION, BUSINESS ADMINISTRATION, BIO-SCIENCES, BASIC SCIENCES, HOME SCIENCE, COMMERCE, FINE ARTS, JOURNALISM & MASS COMMUNICATION, AGRICULTURE, YOGIC SCIENCE, PHYSICAL **EDUCATION AND TEACHER EDUCATION COURSES** 

Issue No :01

Date of Certification: 07 July 2021 1st Surveillance Due: 06 July 2022

Revision No(): NA

2nd Surveillance Due: 06 July 2023 Certificate Expiry: 06 July 2024 (subject to the company maintaining its system to the

Certificate No:- 0707Q119521

To Verify this Certificate please visit at www.otabucert.com







Dr. Anita Gupta

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Email:-info@otabucert.com website:-www.otabucert.com

## **Quality Audit Report**

## 7.1.6- Quality audits on environment and energy are regularly undertaken by the institution

Shri Ram College (SRC) in Muzaffarnagar is dedicated to fostering sustainability and environmental consciousness through systematic quality audits and various initiatives focused on the environment and energy. Regular audits are critical to assessing the institution's environmental performance and guiding its sustainable practices. The following outlines the key components of SRC's environmental and energy audits, along with the initiatives undertaken both on and off-campus.

#### 1. Green Audit/Environmental Audit

A green audit, also known as an environmental audit, is a comprehensive evaluation of the college's environmental performance, compliance with regulations, and the impact of its operations on the environment. The audit focuses on several objectives, components, and processes to ensure effective sustainability practices.

#### **Objectives:**

**Compliance Assessment:** Evaluate adherence to environmental regulations at local, national, and international levels.

Resource Efficiency: Identify methods to reduce energy, water consumption, and waste generation.

**Pollution Control:** Assess measures in place to manage emissions and discharges, aiming to minimize environmental impact.

**Sustainability Improvement:** Recommend practices and technologies for enhancing sustainability.

#### Components:

**Energy Audit:** Analyzing energy consumption patterns and identifying opportunities for reducing energy usage and increasing the use of renewable resources.

Waste Management Evaluation: Analyzing waste generation, recycling rates, and disposal methods.

Water Usage Assessment: Evaluating water consumption patterns and conservation efforts.

Co-ordinator
IQAC, Shri Ram College,
Muzaffarnagar

Chairman IQAC, Shri Ram College, Muzaffarnagar **Biodiversity and Ecosystem Impact:** Reviewing implications on local ecosystems from college operations.

#### Process:

Planning: Identify the audit scope and objectives.

Data Collection: Gather quantitative and qualitative data through surveys and inspections.

Analysis: Assess data to identify strengths and areas for improvement.

Reporting: Document findings and recommend actions.

Follow-Up: Monitor the implementation of recommendations.

#### Benefits:

Risk Management: Identifies environmental risks and compliance issues.

Cost Savings: Reduces operational costs through efficient resource use.

Corporate Reputation: Enhances the institution's image by committing to sustainability.

Regulatory Compliance: Helps avoid fines for non-compliance.

#### 2. Energy Audit

An energy audit at SRC involves a systematic assessment of energy use in college buildings and facilities, targeting opportunities to improve efficiency and reduce costs.

#### **Key Components:**

Data Collect historical energy bills, assess schedules, and conduct on-site inspections.

Energy Use Analysis: Evaluate consumption patterns and identify major energy-using systems.

Benchmarking: Compare performance against similar facilities.

**Identification of Savings Opportunities:** Identify inefficiencies and suggest upgrades or replacements.

Cost-Benefit Analysis: Evaluate the financial viability of implementing energy-saving measures.

Recommendations: Provide prioritized actions for improving energy efficiency.

Types of Energy Audits:

Shri Ram College Shri Ram Gollege

Walk-Through Audit: A preliminary visual inspection of the premises.

Level 1 Audit: A more detailed analysis of energy consumption.

Level 2 Audit: A comprehensive assessment for investment-grade evaluations.

#### Importance of Energy Audits:

Cost Reduction: Helps identify areas for reducing energy expenses.

Environmental Benefits: Supports sustainability by lowering greenhouse gas emissions.

Operational Efficiency: Improves comfort and productivity within campus facilities.

#### 3. Clean and Green Campus Initiatives

SRC has undertaken various clean and green campus initiatives aimed at promoting sustainability and enhancing environmental awareness:

Waste Management: The college promotes waste segregation and recycling, alongside regular awareness programs on the importance of reducing and reusing waste.

**Tree Plantation Drives:** Regular tree planting events encourage student participation in improving campus greenery.

**Solar Energy Utilization:** Installation of solar panels contributes to reducing the campus's carbon footprint.

Water Conservation: The college employs rainwater harvesting and low-flow fixtures, along with campaigns promoting water usage awareness.

Green Audits: Conducting routine audits to assess the effectiveness of sustainability initiatives.

**Awareness Campaigns:** Workshops and seminars focus on environmental stewardship and eco-friendly practices.

Collaboration with NGOs: Partnerships with local organizations bolster community outreach and engagement in sustainability efforts.

Sustainable Practices in Events: The College encourages the use of eco-friendly materials during events, promoting digital communication over paper.

#### 4. Beyond Campus Environmental Promotion and Sustainability Activities

Beyond its campus, SRC actively promotes environmental consciousness through various outreach initiatives:

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QAC. Shri Ram College, Muzaffarnagar Community Clean-Up Drives: Organizing clean-up events that engage students and faculty in beautifying local areas.

Environmental Workshops and Seminars: Hosting educational events that cover pressing sustainability topics.

Collaborative Projects with Local Government: Partnering on projects aimed at environmental conservation and resource management.

**Sustainability Clubs:** Encouraging student organizations that advocate for environmental initiatives and activism.

**Participation in Environmental Campaigns:** Engaging in broader environmental efforts, such as Earth Day and plastic-free initiatives.

Research and Innovation: Supporting student and faculty research aimed at sustainable solutions for local environmental challenges.

Sustainable Transportation Initiatives: Encouraging the use of eco-friendly transportation methods among the community.

Public Sharing of Best Practices: Collaborating with other institutions to share successful sustainability strategies for wider impact.

#### Conclusion

Shri Ram College demonstrates a commitment to environmental stewardship through its regular quality audits and diverse initiatives focused on sustainability. By focusing on green and energy audits, campus greening, and community engagement, SRC is actively contributing to the movement toward a more sustainable future. These efforts instill critical values of environmental responsibility and awareness among its students and staff, setting a meaningful example for other institutions to emulate.

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