

5/6/2022

# REPORT ON GREEN AUDIT, ENERGY AUDIT & ENVIRONMENTAL AUDIT

## **Sariya College, Suriya**

Hazaribag Road Rly Stn., PO: Suriya,  
Dist: Giridih, Jharkhand-825320

**Service Request No.: GDCL/GA/02/042022**



**GREEN DONE  
CONSULTANTS**

*Striving to make the globe greener*

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## 1. Executive Summary:

Eco campus is a concept implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment.

Waste minimization plans for the educational institute are now mandatory to maintain the cleanliness of the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus the conducting Green Audit of institution is essential.

The green auditing of '**Sariya College, Suriya**, enables to assess the practices, action and its impact on the environment. This audit was mainly focused on **Green Indicators** like consumption of energy in terms of electricity and fossil fuel, quality & utilization of water, vegetation, waste management practices and carbon foot print of the campus etc.

The premises were evaluated against the various criteria laid down by the National Assessment and Accreditation Council (NAAC). The major observations are.

### **Renewable Energy**

- The college has installed 3.25 kWp Roof-top Solar Photovoltaic System for self-use and is also planning to install additional solar PV capacity on the new building roof.
- College has a large roof area of about 1800 sq.ft. for installing additional solar PV. Additional Solar PV of 2.0 kWp capacity will aid in reducing grid power consumption and thereby reducing the electricity bills and carbon emissions. At present college's requirement is around 5 -6 KW solar rooftop system based on the consumption.
- The quantity of plate waste (organic waste with higher starch contents) generated within campus is not very substantial, hence there is no potential for biogas generation as of now.

## Green Audit Report – Sariya College, Suriya

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### Green Campus Initiative

- The staff and the students are encouraged to utilize public transport/ cycles. 12.5% staff use cycle and 25% staff utilize public mass transport for daily commuting.
- There is restriction on the usage of plastic, which may be extended to completely ban plastic usage inside the campus.
- The bicycles are utilized for in campus movement as and when required.

### Environment & Energy Initiative

- College may consider replacing existing conventional fans with energy efficiency BLDC fans.
- Institute do not have a single air conditioning unit.
- Since institute is surrounded by forest. College also has planted around 200 trees in its campus.
- Institute may consider planting and growing more number of trees aid in abating the carbon emissions.

### Air Quality & Ventilation

- The classrooms and other area are well ventilated to ensure proper air quality.
- The fans are appropriately installed to ensure proper air circulation

### Lighting System

- The usage of natural light is optimized through windows.
- **College has completely replaced lighting fixtures with LED.**
- Sensor-based energy conservation system like day-light sensors, occupancy sensors, etc. are recommended.

## Green Audit Report – Sariya College, Suriya

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### Water Quality & Conservation

- The water is supplied by bore well.
- The water quality reports are not available. Water analysis is recommended.
- Portable R.O. units are installed for water purification.
- College is collecting rain water and utilizing it for charging bore well indirectly and also for gardening purposes.

### Waste Management

- The effluent water is discharged in the common drainage system however there is no Sewage Treatment plant.
- However, a soak pit is provided for discharging sewage effluent.
- The waste is segregated in two type solid and liquid waste.
- The biodegradable waste being generated is treated in vermin-composting system installed within campus.

### Infrastructure usage

- Ramp and wheel chair is provided for ease of movements for disabled persons.
- Separate rest room and wash room is provided for disabled persons.
- There are adequate fire extinguishers are located at key areas. The college has initiated appropriate measures to meet the safety requirement.
- The draining system for washrooms is efficient and effective.
- No seepages were observed in the building premises.

### Green IT culture

- The electronic communication is encouraged to minimize usage of papers
- Most of the papers are reused for doubled sided printing to further minimize usage of paper.

## 2. Acknowledgment:

We wish to express our gratitude towards Management of **Sariya College, Suriya** for having given us the opportunity for conducting the study and the support provided during the study.

We are also thankful to the PRINCIPAL **DR. SANTOSH KUMAR LAL** and TEACHER **MISS. LALITA YADAV** for extending the necessary help and co-operation from their side.

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### 3. Audit Team:

From **Green Done Consultants LLP, Mumbai**

1. Mr. Atul Joshi – Accredited Energy Auditor & Director.
2. Mr. Alkesh Rajdev – Accredited Sustainability Consultant, IGBC AP & Director.

From **Sariya College, Suriya.**

1. PRINCIPAL - **DR. SANTOSH KUMAR LAL**
1. TEACHER – **MISS. LALITA YADAV**



## 4. Introduction:

### 4.1. About Institute:

Sariya College, Suriya is a premier institution for co-education at Suriya, Giridih District in the State of Jharkhand. It is a permanently affiliated College of Vinoba Bhave University, Hazaribag. It was founded in the year 1984 with an aim to impart higher education to the rural students. The dreams of the poor students who are deprived of higher education have been translated into reality by this glorious institution. Our College caters to the academic and professional needs of boys and girls not only from Suriya ut also from adjoining rural areas and nearby states. The college initially started functioning with only 14 students in the Arts and Commerce Stream and had few teaching staffs. The State Govt. and the university provided temporary affiliation in Arts and Commerce faculties from the session 1984-85. From the session 2011-14 the State Govt. and University provided Permanent Affiliation to the college in the faculty of Arts (General) and Commerce up to honours and general level. Sariya College is registered under society registration act and also registered under section 2(F) and 12 b of UGC of Govt. of India. The college is accredited with NAAC with 1.96 CGPA 'C' grade on 04 March 2019.

### 4.2. Vision Statement of the College

To be recognized as a premier institute that practices quality education to the people of this rural and economically deprived section.

### 4.3. Mission Statement of the College

To build the nation by creating a class of moral, intellectual and committed citizens. To strengthen the human resources. To provide quality education through academic, cultural and physical activities and prepare the students as responsible and useful citizens.



## Green Audit Report – Sariya College, Suriya



Google Earth Image

Fig. 1 Location of the College

The student and faculty strength of the college is listed below:

### Physical Structure:

Physical Structure	
Total Campus Area	11.43 Acres
Built-up Area	9125.86 sq. mts.
No. of Departments	13
Conference Halls	0
Class Rooms	12
Office Rooms	1
Libraries	1
Auditorium	1
Canteen	1
Lab	1
Staff common room	1
Girls common room	1
Boys common room/Divyangjan rest room	1
N S S room	1

## Green Audit Report – Sariya College, Suriya

### Total Strength of Students, Teachers & Non-teaching Staff:

Staff Details	Male	Female	Total
No. of Students	1428	1428	2856
No. of Teaching Staff	9	2	11
No. of Non-Teaching Staff	8	0	8

## 5. Objectives of Green Audit:

The main aim objectives of this green audit is to assess the environmental quality and the management practice and strategies being implemented in Sariya College, Suriya.

The specific objectives are:

1. To monitor the energy consumption pattern of the college.
2. To assess the quality of the water in the campus.
3. To quantify the liquid and solid waste generation and management plans in the campus.
4. To assess the carbon foot print of the college.
5. To assess whether the measures implemented by the College have helped to reduce the Carbon Footprint.
6. To impart environment management plans of the college.
7. Providing a database for corrective actions and future plans.
8. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of waste generated within the campus.
9. To identify the gap areas and suggest recommendations to improve the Green Campus status of the Sariya College, Suriya.

## 6. Target Areas of Green Audit:

Green audit forms part of a resource management process. Although they are individual events, the real value of green audit is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; Minimize waste generation or pollution and also efficiency in resource utilization. All these indicators are assessed in the process of “Green Auditing of this educational institute”.

Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the

## Green Audit Report – Sariya College, Suriya

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institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts.

**Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.**

### 6.1. Auditing for Water Management

Water is a natural resource; All living organisms depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. Groundwater depletion and water contamination are taking place at an alarming rate. Hence it is essential to examine the quality and usage of water in the college. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

### 6.2. Auditing for Energy Management

Energy conservation is an important aspect of campus sustainability which is also linked with carbon footprint of the campus. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

### 6.3. Auditing for Waste Management:

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste.

1. Bio-degradable wastes includes food wastes, canteen waste, wastes from toilets etc.
2. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc.
3. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

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Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the college.

Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable college. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

### **6.4. Auditing for Green Campus Management:**

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

### **6.5. Auditing for Carbon Footprint:**

Burning of fossil fuels (such as petrol) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. Vehicular emission is the main source of carbon emission in the campus, hence to assess the method of transportation that is practiced in the college is important.

## 7. METHODOLOGY ADOPTED:

The methodology adopted to conduct the Green Audit of the Institution had the following components.

### **Onsite Data Collection:**

Due to Covid restrictions, virtual tour of the college campus was organized by the Green Audit Team. The data samples and relevant photographs were collected through geo-tagged photographs. The key focus of the audit was on assessing the status of the green cover of the Institution, their waste management practices and energy conservation strategies etc.

### **Focus Group Discussion:**

The Focus Group discussions were held with the staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level.

### **Energy, Waste Management and Carbon Foot Print Analysis Survey:**

With the help of teachers and staff, the audit team has assessed the energy consumption pattern and waste generation, disposal and treatment facilities of the college. The monitoring was conducted with a detailed questionnaire survey method.

## Green Audit Report – Sariya College, Suriya

### 8. AUDIT STAGE:

Green auditing in **Sariya College, Suriya** began with the assessment of the status of the green cover of the Institution followed by waste management practices and energy conservation strategies etc. The team monitored different facilities at the college, determined different types of appliances and utilities (lights, taps, toilets, air conditioners, etc.) as well as measuring the usage per item (Watts indicated on the appliance, etc.) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions.

### 9. GREEN AUDIT REPORT

#### 9.1. Water Quality Assessment:

Water is supplied through a bore well located in the campus. Institute has installed portable water purifier units to treat the water for drinking purpose.



Institute has not carried out detailed water analysis till date. Hence current water analysis was not available at the time of audit. Considering the water is supplied through a bore well, it is recommended to get the water analysis done at least once in a year.

Institute has installed water coolers to provide cold water to the staff.



## Green Audit Report – Sariya College, Suriya

### 9.2. Water Management:

The source for the water used in the College is through bore well. Institute has installed four overhead tanks of aggregate capacity of 4000 lit capacity. These tanks are bifurcated for domestic water and for drinking water purposes.

Water availability is good throughout the year & institute do not need tanker water to meet its demand.

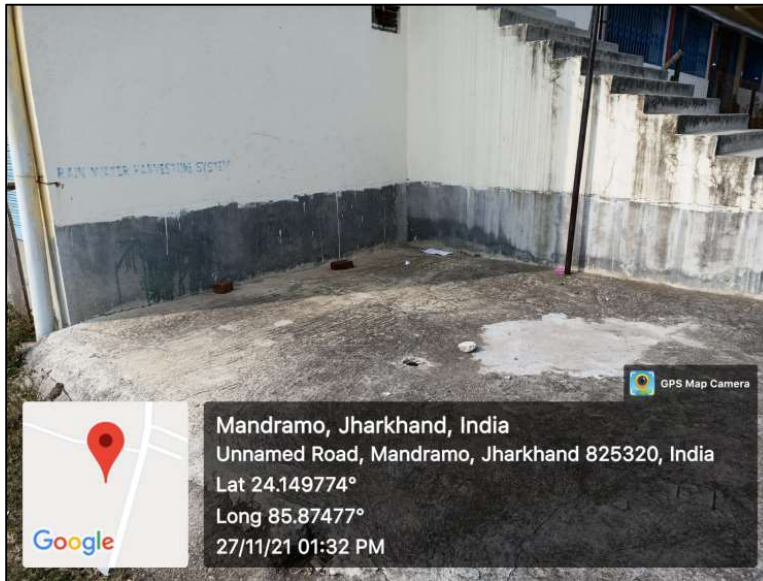
- **Water consumption meter** is not installed and hence no record is maintained for daily water consumption.
- College has displayed signboards for spreading awareness of its water saving initiatives.



- There was no leaking taps or water wastage reported during the audit phase.
- There is no formal water management plan available with the institute.
- The institute has installed a system to **Harvest the Rain Water**. The harvested rain water is stored in an underground well which ultimately helps in charging the underground water tables.



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- There is no **Sewage Water Treatment** plant in the campus to recycle the waste water for the use of flushing and gardening. The waste water is being drained to main drainage system.
- A soak pit to discharge the sewage effluent is available in the campus.



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### 9.3. Energy Audit Report:

#### 9.3.1. Electrical Bill Analysis:

Electricity is supplied by Jharkhand Bijli Vitran Nigam Limited. The institute falls under 'NDS-2' tariff category. The connected load and the saction load is 5 kW. The electricity charges under this tariff is Rs. 6.25/kWh.

College has received electricity bills intermittently. Following table shows the energy consumption pattern of the college over last 12 months. Due to Covid restrictions, the physical college was not operational till July'21 which is reflecting on the energy consumption pattern. However, an average consumption of 700-750 kWh/month is estimated during normal operating scenario.

Billing Details			
Month	Billed For	Consumption kWh	Avg. Monthly Consumption kWh
July-21	7 Months	309	44.1
September-21	2 Months	1460	730.0
March-22	3 Months	2222	740.7

#### 9.3.2. Electrical Consumers:

Institute do not air conditioning units. The list of common electrical consumers along with its typical electricity consumption is provided in the table below.

Room No. / Name	Type of Electrical Device
NAAC Office	2 LED BULB, 1 FAN
NSS Office	2 LED BULB, 1 FAN
Class Room	5 LED BULB, 3 FAN
Class Room	5 LED BULB, 1 FAN
Electricity Room	1 LED BULB
Boys Common Room	4 LED BULB, 2 FAN
EXAM STORE ROOM	2 LED BULB, 1 FAN, 1 COMPUTER
STAFF COMMON ROOM	4 LED BULB, 2 FAN
IQAC CHAMBER	2 LED BULB, 1 FAN, 1 COMPUTER
PRINCIPAL CHAMBER	5 LED BULB, 3FAN, 1 COMPUTER
Common Area	2 LED BULB
Common Area	2 LED BULB
Class Room	6 LED BULB, 4 FAN
Class Room	5 LED BULB, 4 FAN
Class Room	6 LED BULB, 4 FAN

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Class Room	6 LED BULB, 4 FAN
Class Room	6 LED BULB, 4 FAN
GIRLS COMMON Room	8 LED BULB
Class Room	4 LED BULB, 2 FAN
Class Room	5 LED BULB, 2 FAN
Class Room	4 LED BULB, 2 FAN
SMART CLASS	9 LED BULB, 5 FAN
STORE ROOM	2 LED BULB
Library	15 LED BULB, 07 FANS, 1 COMPUTER
Computer Lab	4 LED BULB, 2 FAN, 20 COMPUTER
Canteen	4 LED BULB
Counter	8 LED BULB, 2 FAN, 3 COMPUTER
Auditorium	44 LED BULB, 7 FAN
ROOM NEAR AUDITORIUM	4 LED BULB, 1 FAN
CHANGE ROOM	4 LED BULB
PRINCIPAL CHAMBER TOILET	01 LED BULB, 1 SMALL FAN
STAFF TOILET	1 LED BULB, 1 FAN
GIRLS TOILET	1 LED BULB
Toilet for Boys & Girls	10 LED BULB
CAMPUS	05 LED HIGH VOLTAGE

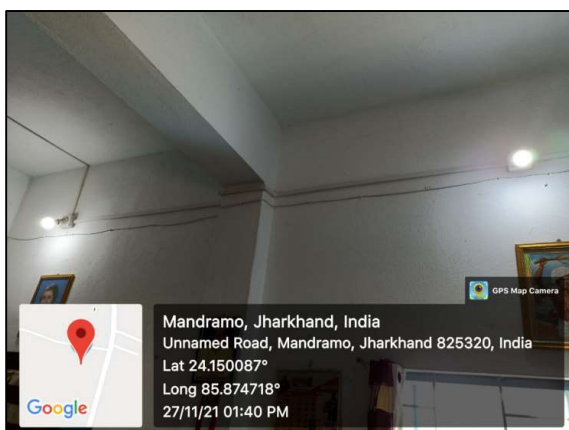
### 9.4. Alternate Sources of Energy and Energy Conservation Measures

- Institute has installed an 'Off Grid' solar PV rooftop system of 3.25 kW capacity.
- However, there 2 no of panels are in damaged condition, thus affecting the output of the system. It is recommended to replace these panels for improved generation.

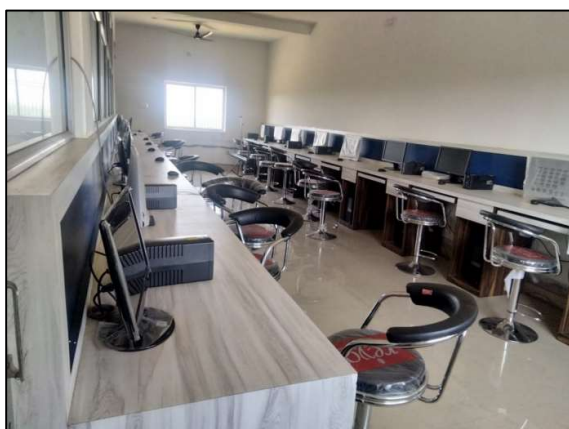


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- College has a large roof area of about 1800 sq.ft. for installing additional solar PV. Additional Solar PV will aid in reducing grid power consumption and thereby reducing the electricity bills and carbon emissions. At present college requirement is around 5.0 KW solar rooftop system based on the consumption.
- Since there is no hostel/ residential facility and the canteen facility is small, hence there is no solar water heating system required.
- Since the biodegradable waste generation is very low, there is no Bio-gas plant.
- Institute is using electricity only from grid and is not wheeling electricity.
- Institute has not adopted to any sensor based energy conservation technique.
- It is recommended to install occupancy based sensors in the offices or day-light sensors in passages to conserve energy.
- **Institute has completely replaced existing lighting fixtures with LEDs and energy efficient lighting fixtures.**



- Institute is utilizing the natural light to its maximum. The classroom and offices are designed in such a way that it allows maximum sun light and reduces requirement of artificial lights.



## Green Audit Report – Sariya College, Suriya

### 9.5. Waste Management:

Following data provide the details of the waste generated & the disposal method adopted by the college.

Total number of stakeholders in the college: **2875**

Staff Details	Male	Female	Total
No. of Students	1428	1428	2856
No. of Teaching Staff	9	2	11
No. of Non-Teaching Staff	8	0	8

Total number of rooms (Class rooms, canteen, office, auditorium, library etc.): **21**

#### 9.5.1. Waste Management Practices Adopted by the College:

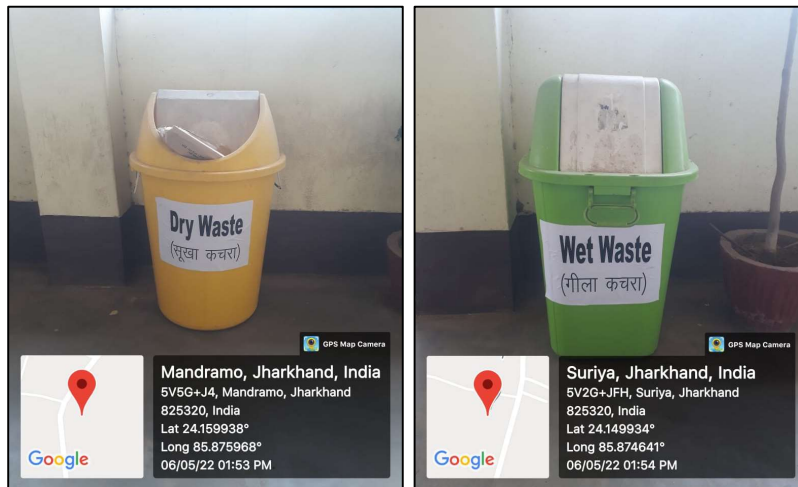
Following table shows the quantum of waste generation from office, labs & canteen.

Approximate quantity of waste generated per day (in kg)				
Office	Type of Waste			
Quantity	Biodegradable	Non-Biodegradable	Hazardous	Others
< 1kg	Paper	Plastic, etc.	NIL	NIL
2 - 10 kg				
> 10 kg				
Labs	Type of Waste			
Quantity	Biodegradable	Non-Biodegradable	Hazardous	Others
< 1kg		Plastic, etc.		NIL
2 - 10 kg				
> 10 kg				
Canteen	Type of Waste			
Quantity	Biodegradable	Non-Biodegradable	Hazardous	Others
< 1kg	Canteen wastes	Plastic, etc.		NIL
2 - 10 kg				
> 10 kg				

- There is no biomedical waste generation happening in the college.
- There is no hazardous chemicals and radioactive waste getting generated in the college.
- The institute is segregating the waste in to 2 categories viz. solid & liquid waste.



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### 9.6. Green Campus:

The college is surrounded by forest from 3 sides. It also has planted more than 200 trees of various types.



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However, college may initiate more tree plantation and use these trees to offset the carbon footprint of the institute.

Table: List of plants in the campus

Sr. No.	Local Name	Scientific Name	No. of Tree	Weight in Pound
1	Mango	Mangifera Indica	3	275
2	Akeshiye	Acacia Manginum Fabacea	26	9450
3	Shisham	Dalbegia Siso	8	2450
4	Kathal	Arto Carpus hetero phylles	1	100
5	Cashew	Anacardium accideutale 01	1	120
6	Gulmohar	Delouix regia	20	8310
7	Karonj	Millettia Pinnata	3	580
Sr. No.	Local Name	Scientific Name	No. of Tree	Weight in Pound
8	Jamun	Syzygium cumini	44	6005
9	Kadam	Neolamarckia Cadamba	6	1150
10	Awanla	Phyllanthus emblica	3	500
11	Gamhar	Gmelina arborea	2	100
12	Neem	Azadirachta Indica	1	60
13	Kekar	Vachellia Karroo	2	375
14	Tad	Barassus flabellifer 01	1	600
15	Chatani	Shorea robusta	15	6010
16	Thuja		21	
17	Sammi		5	
18	Sweet Mohgani		6	
19	Coconut		5	
20	Interior plant		28	
		<b>Total</b>	<b>201</b>	

### 9.6.1. Green Campus Initiatives:

Following are few activities under green campus initiatives.

- Use of Cycles is being promoted for internal transport.
- Automobile entry is partially restricted in the college campus.

## Green Audit Report – Sariya College, Suriya



- To promote green initiatives, college staff utilize cycles and public transport for daily commuting. About 12.5% of the staff use cycle and 255 of the staff utilize mass public transport/ school bus for daily commuting.
- Battery powered vehicles are being used and promoted in the college.



- Institute has initiated banning plastic in the campus.
- The pathways inside the campus are pedestrian friendly.

### 9.6.2. Quality audits on Environment and Energy:

Institutes has initiated carrying out following audit on regular basis.

1. Green Audit
2. Environmental Audit
3. Energy Audit

This is the first audit and institute plans to have such audits at regular frequency.



## Green Audit Report – Sariya College, Suriya

Institute is carrying out many environmental promotion activities in the campus throughout the year. These activities include

- ✓ Cleanliness Drive
- ✓ Plantation Drive

The institute not only organizes such program inside the campus but is also actively doing it outside the campus as well.



## सरिया के प्राचार्य डा. एसके लाल को मिला बेस्ट प्रिंसिपल का अवार्ड



संतोष कुमार लाल

**सरिया.** केंद्रीय सूक्ष्म, लघु और मध्यम उद्यम मंत्रालय के अंतर्गत स्थापित संस्था रिसर्च एजुकेशन सॉल्यूशंस द्वारा बेस्ट प्रिंसिपल का अवार्ड सरिया कॉलेज सरिया के प्राचार्य डॉ संतोष कुमार लाल को दिया गया. इस सम्मान की घोषणा गत 24 अप्रैल 2022 को इंटरनेशनल कॉन्फ्रेंस ऑन इंडस्ट्रियल रिवॉल्यूशन एंड इनोवेशन इन मैनेजमेंट में की गई. डॉ लाल को पूर्व में भी कई सम्मान मिल चुके हैं. अब तक उनके कई शोध निबंध तथा दो पुस्तकों का प्रकाशन हो चुका है. लगभग

चालीस कॉन्फ्रेंस, सेमिनार में उनकी सहभागिता रही है. कॉलेज के विकास के प्रति दूरदर्शी उद्देश्य, समर्पित भावना से काम करना, छात्रों में शिक्षा का वातावरण, सुविधा बढ़ाना आदि कार्य उनके इस अवार्ड का परिणाम है. इस अवार्ड के लिए स्थानीय विधायक विनोद कुमार सिंह, विभागीय के प्रति कुलपति डॉ अजोत कुमार सिन्हा, पूर्व कुलसचिव प्रो (डॉ) एम के सिंह, कुलमुशासक प्रो (डॉ) मिथलेश कुमार सिंह, कॉलेज के शिक्षक, शिक्षकेतर कर्मी तथा छात्र छात्राओं ने बधाई दी.

## स्वच्छ भारत अभियान के लिए जागरूकता जरूरी

सवाद सहयोगी, सरिया (गिरिडीह) : गुरुवार को सरिया कॉलेज में वाणिज्य विभाग की ओर से स्वच्छ भारत अभियान विषय को लेकर एक सेमिनार का आयोजन किया गया। कार्यक्रम के मुख्य वक्ता पीटीपीएस कॉलेज के प्राचार्य डॉ. नवीन प्रसाद, उदय प्रसाद सिंह, सरिया कॉलेज के सचिव जानकीलाल डागा, शासी निकाय के सदस्य राजेश कुमार जैन आदि उपस्थित थे। इसमें छात्र छात्राओं ने स्वच्छ भारत मिशन की सफलता के बारे में विचार रखे। इसमें आमंत्रित अतिथियों का स्वागत किया गया। डॉ. नवीन प्रसाद ने कहा कि स्वच्छ भारत मिशन सिर्फ सरकार के प्रयास से संभव नहीं है। इसके लिए सभी भारतीयों को जागरूक होने की आवश्यकता है। कहा कि स्वच्छ भारत अभियान एक जन आंदोलन के समान है। इस नाते हम सभी

की इसमें बराबरी की भूमिका है। उदय प्रसाद सिंह ने कहा कि स्वच्छता के लिए हम लोगों को जागरूक होने की जरूरत है। कॉलेज के विद्यार्थी प्रगति डागा, मंडू पूजा, जीतेंद्र, शिवम कुमार, जया श्री राहुल कुमार, सुष्मिता कुमारी, साक्षी मोहनियाज अंसारी, दिवाकर राज आदि विचार रखे। कॉलेज के प्रोफेसर ईंचा सतीश कुमार मलदहियार, डॉ. विनीत सिन्हा, प्रो. सतीश कुमार वर्मा ने बातों व रखा। सेमिनार में सबसे बेहतर विचार रखे वाले शिवम कुमार को पुरस्कृत किया गया कार्यक्रम का संचालन डॉ. संतोष कुमार लाल तथा धन्यवाद ज्ञापन प्रो. रवींद्र कुमार मिश्रा ने किया। कार्यक्रम को सफल बनाने में प्रो. अरुण कुमार, कार्तिक प्रसाद यादव, रघुनंदन हजाम, रंजीत कुमार, सागर कुमार सतीश कुमार आदि का योगदान रहा।

## कॉलेज में चलाया गया स्वच्छता अभियान

संस, सरिया (गिरिडीह) : शुक्रवार को सरिया कॉलेज में एनएसएस इकाई के बैनर तले स्वच्छ भारत समर इंटरशिप कार्यक्रम की शुरुआत की गई। पहले दिन छात्र-छात्राओं ने महाविद्यालय प्रांगण में स्वच्छता अभियान चलाया। इस दौरान एनएसएस के कार्यकर्ताओं ने कॉलेज के इर्द-गिर्द कचरों को व गंदगी को साफ करने का काम किया। इस दौरान प्रो. डॉ संतोष कुमार लाल ने कहा कि यह कार्यक्रम एक महीने तक चलेगा। इस दौरान छात्र- छात्राएं गांव व शहर में जाकर स्वच्छ भारत मिशन के बारे में लोगों को बताएंगे तथा उन्हें जागरूक करने का काम करेंगे। एनएसएस के कोऑर्डिनेटर रवींद्र कुमार मिश्रा ने कहा कि स्वच्छता ही सभ्यता की पहचान है इसलिए हमें अपने आसपास की जगह को स्वच्छ रखना चाहिए। अरुण कुमार ने कहा कि एक मनुष्य होने के नाते मनुष्य को समाज के लिए भी कुछ कार्य करना चाहिए। इस स्वच्छता अभियान में अभय कुमार साव, शिवम कुमार, अंजली कुमारी, पूर्णिमा कुमारी, प्रीति कुमारी, खुशबू रानी, अनिल कुमार, संजु, प्रतिमा कुमारी, निकिता सोनी उपस्थित थे।

## गिरिडीह

### सरिया कालेज के प्राचार्य सम्मानित

संस, सरिया (गिरिडीह): भारत सरकार के सूक्ष्म, लघु और मध्यम उद्यम मंत्रालय की संस्था रिसर्च एजुकेशन सॉल्यूशंस ने बेस्ट प्रिंसिपल का अवार्ड सरिया कालेज के प्रिंसिपल डा. संतोष कुमार लाल को दिया। 24 अप्रैल को इंटरनेशनल कॉन्फ्रेंस ऑन इंडस्ट्रियल रेवोल्यूशन एंड इनोवेशन इन मैनेजमेंट में अवार्ड की घोषणा की गई। इसमें देश के कई शिक्षाविद जुड़े हुए थे। प्राचार्य ने विभिन्न विषयों पर लगभग बारह रिसर्च जर्नल, तीन चैप्टर तथा दो पुस्तकों का प्रकाशन किया।

### 9.6.3. Routine Green Practices:

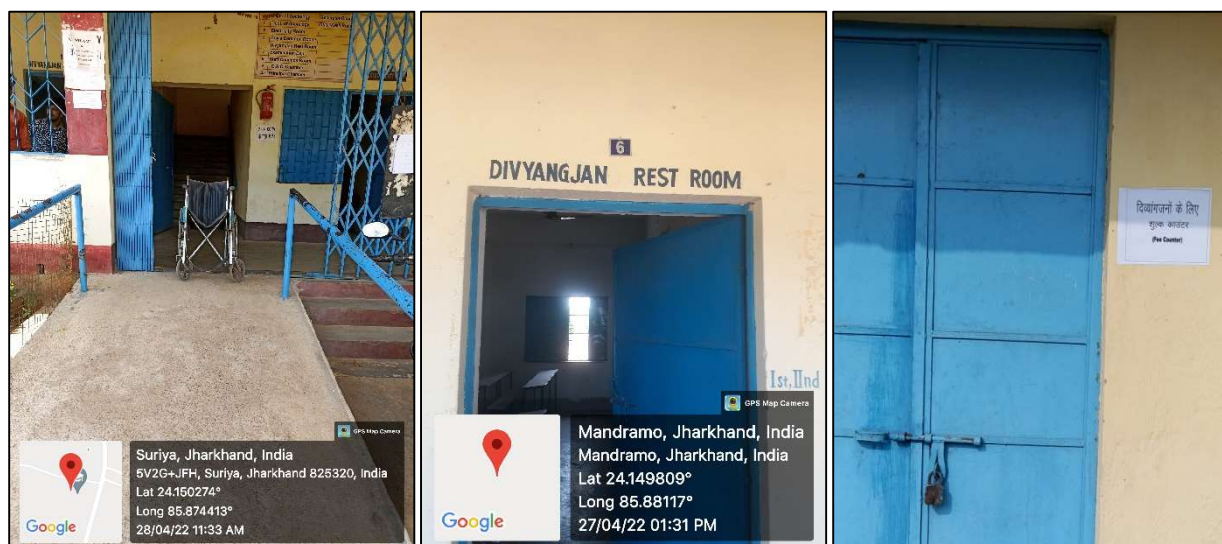
Every year college celebrates World Environment Day and World Water Day in the campus. The main focus of these programs was to provide awareness to the students about the importance of the environment, its conservation and sustainable use of environmental resources. The programs are conducted through seminars, poster presentation, quiz competition debates etc.

### 9.6.4. Disabled-Friendly Environment:

Institute has provided a ramp & wheel chair for easy access to classrooms for disabled students and staff. A separate rest room is also provided for disabled staff or student. There is separate counter for fess payment for disabled person.



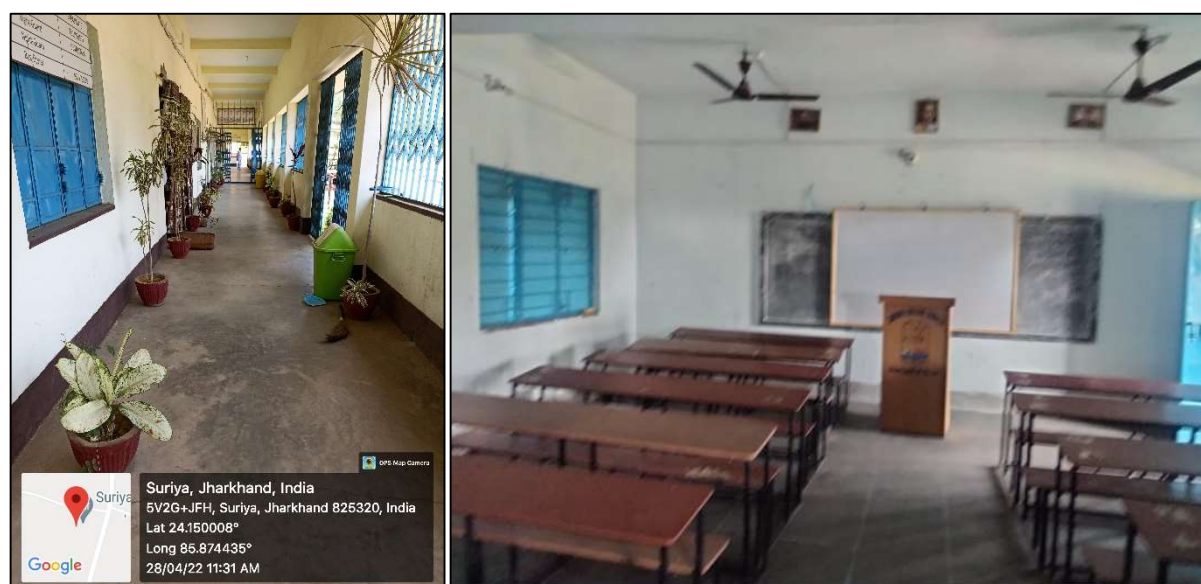
## Green Audit Report – Sariya College, Suriya



College also provides required assistance to Disabled students during examination as provided in the rules & regulations.

### 9.6.5. Air Quality & Ventilation:

The classrooms and offices in the premises are well ventilated. The fans are operational and adequately placed to effect the sufficient air changes. Fans installed are not star-rated. College has done indoor plantation to provide fresh air inside the premises.



## Green Audit Report – Sariya College, Suriya

### 9.6.6. Infrastructure Usage:

- The campus has proper drainage system and there were no leakages/ seepages from the roof was observed.
- The premises has fire extinguishers installed at required locations which are regularly checked and maintained.



### 9.6.7. Green IT Culture:

The institute is following a green IT culture.

- Email/ electronic communication mode is preferred to save papers.
- Both side printing is being adopted to save paper and trees.



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### 10. Carbon Foot Print Analysis:

#### 10.1. CO<sub>2</sub>e Calculation:

Carbon Foot Print Calculation		
A- Scope 1 (Direct Emission)		
Source	Fuel Consumption	CO <sub>2</sub>
DG	NA	NA
Vehicles	NA	NA
Others	NA	NA
B- Scope 2 (Indirect Emission)		
Source	Unit Consumption	CO <sub>2</sub> (KG)
Electricity Consumption	3991	3591.9
<b>Total A+B</b>	<b>3991</b>	<b>3591.9</b>
Carbon Offset		
Source	Quantity	CO <sub>2</sub> (KG)
Solar	Nil	0
Trees	187	3740
Others	Nil	0
<b>Total</b>	<b>Nil</b>	<b>3740</b>

Sr. No	Description	Remark
1	Direct Emissions	No Data available
2	Indirect Emissions	Calculated as per international standards
3	Reductions	With Solar PV capacity addition, there will be increase in the carbon offset.

## 11. SUGGESTIONS AND RECOMMENDATIONS:

### 11.1. Water Management:

- Monitoring of water consumption will be required for ensuring water efficiency. Water meter to be installed to monitor the consumption. The water meter readings to be recorded every day or every week at a fixed time.
- It is recommended to check water quality from water source for dissolved oxygen, acidity, alkalinity, chloride, hardness, pH, and conductivity, total dissolved solids and E-coli/ coliform.
- The wash basin taps may be equipped with water saving fixtures.
- The flush tanks of the toilets may be fitted with dual volume system.

### 11.2. Energy Management:

- As the college has a large roof area for installing solar panels, it is advisable to install additional 2 kWp capacity of solar PV which will aid in reducing grid power consumption and thereby reducing the electricity bills and carbon footprint of the institute.
- At present college requirement is around 5 - 6 KW solar rooftop system based on the consumption. 3.25 kW system is already installed. Thus college needs to installed additional solar PV rooftop system of 2 kWp. The saving and payback calculations are provided in the table below.

Sr. No.	Parameters	Unit	Value
1	Average Monthly Electricity Consumption	Units	740
2	Connected Load	kW	5
3	Area Available	ft <sup>2</sup>	1800
3	Solar PV Capacity Based on Area Available	kW	18.0
4	Solar PV Capacity Based on Connected Load	kW	5.0
5	Solar PV Capacity Based on Consumption	kW	5.9
6	Solar PV Capacity (Least of three)	kW	5.0
7	Solar Capacity Already Installed	kW	3.25
8	Additional Capacity Required to be Installed	kW	2.0
9	Cost of Solar PV (On-grid)	Lacs Rs.	1.0
10	Electricity Tariff	Rs./kWh	6.25
11	Unit Generation per annum	kWh	2430.0
12	Cost Saving per Annum	Lacs Rs.	0.15
13	Payback period	Years	6.6
14	ROI	%	15.2%

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- The energy audit recommend to avoid the use of more energy consuming electrical appliances and to replace with more environment friendly and energy efficient appliances (for example five stars rated Air conditioner, star rated fans) in the college.
- Ceiling fans have a very good scope for reducing power consumed using a technology called Brushless DC Motor or simply BLDC motor. BLDC technology, in general, has been in the market for a couple of decades. The traditional fan uses an induction motor and typically consumes 70-90 watts. But BLDC fan, on the other hand, can reduce power consumption up to 65%.
- Prominent advantages of BLDC motor over induction motor are Lower Electricity Consumption, Longer backup on Inverters (even on Solar), improved reliability, Noise reduction, longer lifetime.
- Institute may considered replacing existing fan with BLDC fans. The techno-commercial analysis is given below.

Sr. No.	Parameters	Unit	Value
1	Total No. of Fans	Nos.	66
2	Power Drawn by Regular Fans	Watts	80
3	Power Drawn by BLDC Fans	Watts	35
4	Energy Saving per Fan	Watts	45
5	Operating Hours Per Day	Hrs/Day	6
6	Annual Operating Days	Days/Yr	312
7	Annual Energy Savings Per Fan	kWh	84.24
8	Annual Energy Savings – For 66 Fans	kWh	5559.84
9	Energy Cost	Rs./kWh	6.25
10	Annual Cost Savings	Lacs Rs.	0.35
11	Estimated Investment	Lacs Rs.	1.98
12	Simple Payback	Years	5.7

- College may adopt sensor-based (occupancy sensors) energy conservation approach for offices, classrooms and washrooms as well.

### 11.3. Green Campus:

- College may considered planting more trees to offset the entire carbon footprint and target for net zero emissions.

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### 11.4. Waste Management:

College may undertake feasibility study to install sewage water treatment in the campus to recycle waste water and use it in flush or for gardening purpose.

Leaf litter from the campus can be effectively used for aerobic/ vermi composting, so that the composted material can also be used as good manure.

Try to completely ban the use of plastic in the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus.