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REPORT ON GREEN AUDIT, ENERGY AUDIT & ENVIRONMENTAL AUDIT A. K. Singh College

Japla, Palamau, Jharkhand - 822116

Service Request No.: GDCL/GA/03/0624



Prepared By:

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Principal A.K.Singh College Japla, Palamau



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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 into 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 into an eco-campus, the conducting Green Audit of institution is essential.

The green auditing of 'A. K. Singh College, Japla, Palamau, Jharkhand', enables us 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 footprint 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 provided below.



Renewable Energy

- > The college have installed 10kWp Roof-top Solar Photovoltaic System for self-use.
- The quantity of plant waste (organic waste with higher starch contents) is not very substantial, consequently, when the plants grow enough, college may explore the potential for biogas generation.

Green Campus Initiative

- > There are pedestrian friendly pathways for in-campus movement.
- > College is a 'Plastic Free' campus.
- > The campus is surrounded by greenery, trees, and proper landscaping.
- The bicycles are allowed for in-campus movement as required. Cycle stands should be provided inside the campus.
- > Around 70% of staff and students use public transport for daily commuting.
- > The movement of vehicles inside the campus is not restricted.

Environment & Energy Initiative

- > The Institute has planted more than 38 varieties of more than 140 trees on its campus.
- > Institute may go for replacement of existing fans with energy efficient BLDC fans.

Air Quality & Ventilation

- > The classrooms and other areas are well ventilated to ensure proper air quality.
- > The fans are appropriately installed to ensure proper air circulation
- > The indoor as well as outdoor plants have also been provided to improve the environment.

Lighting System

- > The usage of natural light is optimized through well designed structures and windows.
- > College may initiate replacement of lighting fixtures with energy efficient LEDs.
- Institute may install sensor-based systems (motion sensors/ day-light sensors) to control operations of lights to save energy. It is recommended to install sensor-based devices to increase energy conservation.



Water Quality & Conservation

- > The water is supplied through the bore well.
- > The water quality reports are not available. Water analysis is recommended.
- > Water purifiers are installed for water purification.
- > The rainwater harvesting system is available and in use.
- > The distribution network and piping were found satisfactory and adequate.

Waste Management

- The effluent water is discharged in the common drainage system, however there is no Sewage Treatment plant.
- > The waste is segregated into two types solid and liquid waste.
- E-waste is to be collected & disposed of separately.
- > For plant waste and dry leaves vermi-composting can be maintained.

Green IT culture

- > Electronic communication is encouraged to minimize usage of papers.
- Most of the papers are reused for double sided printing to further minimize usage of paper.

Infrastructure usage

- Ramps and wheelchairs are provided for ease of movements for disabled persons.
- > The on-campus movement is distributed with multiple entrances as well as staircases.
- > Fire extinguishers have been installed in key areas.
- > The draining system for washrooms is efficient and effective.
- ➢ No seepages were observed in the building premises.

foolide

Mr. Atul Joshi Accredited Energy Auditor (AEA-0037) Bureau of Energy Efficiency (BEE, MoP) Director – Green Done Consultant LLP.

21315349

Mr. Alkesh Rajdev Accredited Professional Indian Green Building Council Director – Green Done Consultant LLP



2. Acknowledgment:

We wish to express our gratitude towards the Management of A. K. Singh College, Palamau,

Jharkhand for having given us the opportunity for conducting the study and the support provided during the study.

We are also thankful to the **PRINCIPAL Mr. Suryamani Singh** and **NAAC Coordinator Arun**

Kumar Singh for extending the necessary help and co-operation from their side.

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 A. K. Singh College, Palamau, Jharkhand.

- 1. Principal Mr. Suryamani Singh and
- 2. IQAC/ NAAC Coordinator Mr. Arun Kumar Singh



4. Introduction:

4.1. About Institute:

The college was established by Late Awdhesh Kumar Singh (Ex MLA and Minister of Bihar Govt) in 1984 with valuable support from some intellectual of the town and local villagers. It is situated at the bank of river Harhi. It was set up with an idea and vision impart higher education to the student of the locality without going outside Japla at the time when the concept of private education was not common in the mind of people .For some time it is running well but in the last phase of the year after 1995-96 the financial condition of the college came to very low and the college reached to the stage of near closer. In the year 2008-09, The college got a new life by support of Honourable Shri Kamlesh Kumar Singh (current MLA and Ex Minister Govt of Jharkhand).

At present it is the first and the last degree college of Japla town. From 1984 to 2008 it was an affiliated college of Ranchi University. After bifurcation of Ranchi University, it is a part of Nilamber Pitamber University Medininagar. At present it is a Permanent Affiliated unit of NPU. Presently college has established as a one of the best college amongst Nilamber Pitamber University. Large strength of student and good academic record gives us promote enhance teaching learning facility. The teacher are actively engaged in research, innovation of teaching method, seminar and co-curriculum and extra curriculum activity. The mainstay of the institution has been to lead a whole some life by nurturing in them the human qualities as well as professional abilities to emerge as informed and responsible citizen.

Vision

To promote advancement of learning and dedication for better academic and intellectual achievements.

To develop intellect, skill, knowledge and creativity so as to cope with the contemporary changes in the curriculum aspects.

To provide quality education of first generation learner of rural background.

To make sensitive, Sensible and responsible citizen.

To elevate the aspiring rural students in the academic and non-academic sphere thereby transforming them into environmentally sensitive and self-reliant citizens



Mission:

To encourage extracurricular and outreach activities among all the stakeholders by following the principles of benevolence, honesty, sacrifice, sincerity and high moral or ethical standards of behaviour.

"Quality Education at Affordable Cost"

To promote and enhance quality education catering to the contemporary challenges

To empower girls through higher education.

To provide the students with knowledge, skills, values and sensitivity to face the challenges in life both in academic field as well as in their personal life.

To develop the human potentials to achieve different opportunities in future.

To enhance the new teaching learning process for students, faculties and staffs.

To get optimum Result.

To provide better facility for higher education to the marginalised section of the especially ST/SC students.



The college is situated in a rural area in Japla and is about 80 kms. from Palamau, which is one of the district headquarter of thevState. The surroundings of the college are spread with well-maintained gardens, buildings, hostels, a computer centre and playground. Believing in the holistic development of the students, the college is keen to make available its best facilities.

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

Physical Structure					
Total Campus Area	5.16 Acre				
Built-up Area	1458 Sq. mtr.				
No. of Departments	19				
Conference Halls	1				
Class Rooms	13				
Office Rooms	10				
Libraries	1				
Auditorium	0				
Canteen	1				
Other Teacher Room	1				
Other Girls Common Room	1				
Other Tea Room	1				
LAB-	7				
Geography	1				
Psychology	1				
Home Science	1				
Physics	1				
Chemistry	1				
Botany	1				

Physical Structure:

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

Staff Details	Male	Female	Total
No. of Students	1719	1575	3294
No. of Teaching Staff	27	1	28
No. of Non-Teaching Staff	34	6	40



1. Objectives of Green Audit:

The main aim objectives of this green audit are to assess the environmental quality and the management practice, and strategies being implemented in A. K. Singh College, Japla, Palamau, Jharkhand.

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 footprint 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 A. K. Singh College, Japla, Palamau, Jharkhand.



2. 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 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 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.**

2.1. 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.

2.2. 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.

2.3. 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 & hazardous waste.

- 1. Bio-degradable wastes include 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.

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.

2.4. Auditing for Green Campus Management:

Trees play an important ecological role within the urban environment, as well as supporting improved public health and providing 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.

2.5. 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.



3. METHODOLOGY ADOPTED:

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

Onsite Data Collection:

A 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 on 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 Footprint 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.


4. AUDIT STAGE:

Green auditing in **A. K. Singh College, Palamau, Jharkhand** 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.

5. GREEN AUDIT REPORT

5.1. Water Quality Assessment:

Water is provided through two bore well. Institute have install R.O. system for drinking water. The bore well water is being used for flushing and gardening. Institute has not carried out lab testing of bore well water sample. Hence the current water analysis report was not available at the time of audit. The Institute has installed water coolers to provide cold water to the staff and students.







5.2. Water Management:

The source for the water used in the College is bore-well water. Institute has installed three overhead tanks with a capacity of 2 KL.

- Water availability is good throughout the year & the institute does not need tanker water to meet its demand during peak summer.
- A water meter is not installed on the bore-well and hence, no record is maintained for daily water consumption.
- > There were no leaking taps or water wastage reported during the audit phase.
- > There is no formal water management plan available with the institute.
- > College has displayed signboards for spreading awareness of its water saving initiatives.
- > The institute is harvesting the Rainwater.
- There is no Sewage Water Treatment plant on the campus to recycle the wastewater for the use of flushing and gardening. The wastewater is being drained into the soak pit.
- > The effluent generation from the laboratory is being discharged into the common.





5.3. Energy Audit Report:

5.3.1. Electrical Bill Analysis:

Electricity is supplied by JHARKHAND BIJLI VIRTARAN NIGAM LIMITED (JBVNL). The institute falls under the CS Urban (DS) tariff category.

CS Urban (DS) triff is applicable for supply of electrical energy for non-domestic, using electrical energy for light, fan and power loads for non-domestic purposes like non-government schools, colleges, libraries and research institutes, and other installations not covered under any other tariff schedule of LT Categories.

The rates are given in the following table.

	Tariff-Exi	Proposed Tariff FY 23-24			
Category/ Sub- Category	Slabs	EC	FC	EC	FC
	NDS-I (Ruml) (0- 400)	5.75/kWh 50. Mo	50.00 / kW /	7.25/kWh	200.00 / kW / Month
NIDE	NDS -I (Rural) (401 and above)		Month	8.25/kWh	200.00 / kW / Month
NDS	NDS-II (Urban) (0- 400)	(100.00 / kW /	8.00/kWh	250.00 / kW / Month
	NDS-II (Urban) (401 and above)	0.007 KWII	Month	9.00 / kWh	250.00 / kW / Month

The college is consuming an average of 2100 kWh/ month of electrical energy.

5.3.2. Electrical Consumers:

Institute does not have air conditioners. The list of common electrical consumers along with its typical electricity consumption is provided in the table below.

ci				Power	Оре	ration
51. No	Room No. / Name	Type of Electrical Device	Nos.	Watt	Hrs/Day	Days/Mont h
1	1	1F+3 LED BUBLB	4	70	8/6	26/12
2	2	4F+2 LED BUBLB	6	220	8/6	26/12
3	3	4F+2 LED BUBLB	6	220	8/6	26/12
4	PSYCHOLOGY LAB	4 Fan2 BUBLB	6	220	8/6	26/12
5	SMART CLASS	6F+2 LED BUBLB	8	320	8/6	26/12



6	GEOGRAPHY LAB	6F+2 LED BUBLB	8	320	8/6	26/12
7	Principal Chamber	2F+2 LED BUBLB+1 LED TV+1 COOLER +1AC	7	2200	8/6	26/12
8	Head Clerk	1F+2 LED BUBLB	3	70	8/6	26/12
9	Seminar Hall	8F+2 LED BUBLB	10	600	8/6	26/12
10	Computer Lab	6F+ 2 LED BUBLB+ 15 COMPUTER	23	500	8/6	26/12
11	Library cum study Room	6F+3 LED BUBLB	9	9	8/6	26/12
12	Coridor	0+9 LED BUBLB	9	45	8/6	25/12
13	CASH ROOM	2F+ 2 LED BUBLB +1 COOLER	5	400	8/6	25/12
14	HALL-1	8F+4 LED BUBLB	12	500	8/6	25/12
15	HALL-2	8F+ 4 LED BUBLB	12	500	8/6	25/12
16	HALL-3	8F+4LED BUBLB	12	500	8/6	25/12
17	ZOOLOGY LAB	4F+8 LED BUBLB	12	300	8/6	25/12
18	BOTANY LAB	4F+8 LED BUBLB	12	300	8/6	25/12
19	CHEMISTRY LAB	7F+4 LED BUBLB	11	280	8/6	25/12
20	PHYSICS LAB	6F+4 LED BUBLB	10	250	8/6	25/12
21	C.C.T.V. L.E.D Screen	2	2	120	8/6	25/12

Office space equipment

SI.	Room No. /	Room No. /		Powe r	Operation		Star
	Name	Туре	Nos.	Watt	Hrs/Da y	Days/Mont h	g
1	Examination	6F+4 LED BUBLB+1 COMPUTER+1 PRINTER	12		8/6	25/12	3 Star
2	Accountant	3F+3 LED BULB+1 AC	7	2000	8/6	25/12	3 Star
3	IQAC	3F+3 LED BUBLB+2 PRINTER+1 COMPUTER	6	250	8/6	25/12	
4	Cash Counter & Marks Dispute/ Enquiry counter	5F+2 LED BUBLB+ 2 COOLER	9	700	8/6	25/12	
5	NSS	1+ 2 LED BUBLB+1 PRINTER	4	200	8/6	25/12	
6	ADMISSION	2F+2 LED BUBLB+1 COOLER	5	300	8/6	25/12	
7	CANTEEN	0F+1 LED BUBLB	1	5	8/6	25/12	



5.4. Alternate Sources of Energy and Energy Conservation Measures

- > The Institute is have install a Solar PV Rooftop system of 10kWp.
- Since the biodegradable waste generation is very low, there is no Bio-gas plant.
- > Institute is using electricity from grid, Solar and DG.
- ▶ Institute has not installed any sensor-based energy conservation system yet.
- Institute have been replacing existing lighting fixtures with LEDs and energy efficient lighting.
- > The Institute has air conditioners and most of the air conditioners are 3 star rated.
- Institute is utilizing the natural light to its maximum. The classroom and offices are designed in such a way that it allows maximum sunlight and reduces the requirement of artificial lights.





5.5. Waste Management:

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

Waste Management Practices Adopted by the College:

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

Approximate quantity of waste generated per day (in kg)						
Office		Type of Was	te			
Quantity	Biodegradable	Biodegradable Non-Biodegradable Hazardous Others				
< 1kg	0.5	0.2	0	0.2		
Labs	Type of Waste					
Quantity	Biodegradable	Non-Biodegradable	Hazardous	Others		
< 1kg	0.2	0	0	0		
Canteen	Type of Waste					
Quantity	Biodegradable	Non-Biodegradable	Hazardous	Others		
< 1kg	0	0	0	0		

How the waste generated in the college is managed?				
Options	Yes/No	Remark		
Composting / Vermicomposting	Yes			
Recycling	NO			
Reusing	NO			
Other Ways	NO	Dumped into Municipalities Garbage Bin		

Waste generated in college				
Туре	Separate Collection			
E-waste	Yes Computer, LED, Wire			
Hazardous Waste	NO			
Solid waste	Yes 3 Septic Tanks			
Dry Leaves	YES Vegetarian			
Canteen Waste	Yes			
Liquid Waste	YES Bathroom + Canteen			
Glass	NO			
Unused Equipment /Scrap	Yes			
Napkins	YES			
Others (Specify)	NO			

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- > The waste generated is collected and disposed of by Local Authorities.
- > There is no biomedical waste, hazardous chemicals and radioactive waste getting generated.
- > The institute is segregating the waste into solid & liquid waste.







5.6. Green Campus:

The Institute has planted more than 140 no. of trees on the campus.







S. No.	Species	No. of Plants	S. No.	Species	No. of Plants
1	SAGWAN	7	20	SHADABHAR	15
2	SIRISH	2	21	PAKKAD	1
3	GULMOHAR	2	22	AMALTASH	2
4	NEEM	3	23	KAMINI	2
5	AMRUD	1	24	SHANKU	7
6	AMALA	2	25	BAY LEAF	2
7	BARGAD	1	26	MANDAR	3
8	PEEPAR	2	27	BANANA	1
9	MANGO	4	28	BOTTLE POM	13
10	COCONUT	2	29	TULSHI	2
11	PALASH	2	30	JUJUBE	3
12	KHAIR	1	31	MORE PANKHI	9
13	CHIRCHIRE	1	32	AKWAN	3
14	SHAMMI	2	33	CURRIPATTA	3
15	RUBBER	1	34	LEMON	3
16	PARIJAT	2	35	PATHARCHATTA	2
17	CHANDAN	2	36	LAVANG	2
18	GULAR	1	37	CHINISE IXORA	1
19	ASHOK	25	38	KARANJ	3
		TOTAL			140

Table 6. List of plants in the campus



5.6.1. Green Campus Initiatives:

The following are a few activities under green campus initiatives.

- > Automobile entry is not restricted to the campus.
- Institute is yet to adopt battery-powered vehicles for transportation. However, cycles are being used for internal transport.
- The pathways inside the campus are pedestrian friendly. The campus areas have been designed with the concept of open spaces including roads and lawns.
- The natural landscape has been preserved. There is a clear pedestrian connection through all campus roads and adequate parking facilities
- The Institute is segregating waste in to 'Dry Waste' and 'Wet Waste' before sending it for disposal.
- > Institute is a 'Plastic free' campus.
- Awareness programmers, recycling plastics into reusable materials that do not harm the planet, alternatives to go plastic free, etc. are all afoot in college campuses.
- > The college campus is landscaped with various trees & plants.
- Tree plantation is the major focus of the management to maintain the pristine purity and beauty of the institute to provide a congenial atmosphere for academic and non-academic pursuits.

5.6.2. Quality audits on Environment and Energy:

Institutes have initiated carrying out the following audit on regular basis.

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





This is the first audit, and the institute plans to have such audits at regular frequency. Institute is carrying out many environmental promotion activities on the campus throughout the year. These activities include

- ✓ Cleanliness Drive
- ✓ Plantation Drive

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

5.6.3. Disabled-Friendly Environment:

Institute has provided a ramp for easy access to classrooms for disabled students and staff. Wheelchairs are available for disabled students/ staff for movement in the campus.





5.6.4. Air Quality & Ventilation:

The classrooms and offices on the premises are well ventilated. The fans are operational and adequately placed to affect sufficient air changes. Fans installed are not star-rated.



5.6.5. Infrastructure Usage:

- College premises have multiple entrances and have broad passageways.
- The campus has a drainage system and there were no leakages/ seepages from the roof.
- The premises are equipped with fire extinguishers at required locations which are regularly checked and maintained.

5.6.6. 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.
- ➢ E-waste is not collected separately.



6. Carbon Footprint Analysis:

6.1. CO2e Calculation:

Scope	Source	Quantity	Emission Factor (kg CO₂/unit)	Emissions (kg CO₂/day)	Source of Emission Factor
Scope 1	Fuel used by four- wheelers	10 liters	2.68 kg CO ₂ /liter	26.8 kg CO₂	IPCC Guidelines
Scope 1	LPG cylinders	83.496 liters	1.51 kg CO ₂ /liter	126.08 kg CO ₂	IPCC
Scope 1	Fuel used by generators	10 liters	2.68 kg CO ₂ /liter	26.8 kg CO₂	IPCC Guidelines
Scope 2	Grid Electricity	25200 kWh	0.716 kg Co2/kWh	18043 kg CO2	IPCC CEA Data

6.2. CO2 Reductions Measures

Source	Quantity	Avoided Emissions (kg CO ₂ /year)	Assumptions/Factors Used
10 kWp Solar Installation	45 kWh/day	13,468.5 kg CO₂/year	0.82 kg CO ₂ /kWh for grid electricity (India)
140 Trees Planted	140 trees	2,800 kg CO₂/year	20 kg CO₂/year/tree (India)
Total Annual Avoided Emissions		16,268.5 kg CO ₂ /year	

Sr. No	Description	Remark
1	Direct Emissions	Based on GHG Protocol
2	Indirect Emissions	No Data available
3	Reductions	Institute may install more Solar PV rooftop to offset the emission with cleaner & greener energy sources. Or Plant more trees to offset the emission.



7. SUGGESTIONS AND RECOMMENDATIONS:

7.1. Water Management:

- There should be a proper monitoring of water consumption pattern in the campus. The bore well should be installed with a water meter 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 bore well and R.O. water quality 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 a dual volume system.
- > Institute may install drip irrigation system to water the garden and plants in the campus.

7.2. Energy Management:

- 1. 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%.
- 2. 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.
- 3. Institute may consider replacing existing fan with BLDC fans which

Sr. No.	Parameters	Unit	Value
1	Total No. of Fans	Nos.	115
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	8
6	Annual Operating Days	Days/Yr	312
7	Annual Energy Savings Per Fan	kWh	112.32
8	Annual Energy Savings – For 115 Fans	kWh	12,916.80
9	Energy Cost	Rs. /kWh	6.5
10	Annual Cost Savings	Lacs Rs.	0.84
11	Estimated Investment	Lacs Rs.	3.46
12	Simple Payback	Years	4.1

Green Audit Report - A. K. Singh College, Japla, Palamau, Jharkhand



- The college may adopt sensor-based (occupancy sensors) energy conservation approach for offices, classrooms and washrooms as well.
- 5. No action is required to offset carbon emissions in the present scenario.

7.3. Green Campus:

Battery powered vehicles may be adopted in future to reduce emissions inside campus.

7.4. Waste Management:

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

Efforts to be made to ban the use of plastic on the campus, and to encourage the use of biodegradable materials as alternatives. Try to achieve the goal of plastic free campus.

Principal A.K.singh College Japla, Palamau





Striving to make the globe greener

CERTIFICATE FOR GREEN AUDIT

GREEN AUDIT CERTIFICATE

This Certificate is presented to

A.K. SINGH COLLEGE, Japla, Palamau, Jharkhand - 822116

For completing the GREEN AUDIT of Their Campus on the 7th of April 2023.



This certificate will remain valid for 3 years from the date of issuance.

ATUL JOSHI Accredited Energy Auditor - 0037

By Bureau of Energy Efficiency (MoP, Gol)

Director - Green Done Consultants LLF

ALKESH RAIDEV

Japla Palaman Accredited Professional Indian Green Building Council Green Done Consultants LLP

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Green Done Consultants LLP., 501, ASPEN, Mohan Highlands, Katrap, Badlapur - 421503, Mumbai, India



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ENERGY AUDIT CERTIFICATE

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Green Done Consultants LLP., 501, ASPEN, Mohan Highlands, Katrap, Badlapur - 421503, Mumbai, India



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ENVIRONMENTAL AUDIT CERTIFICATE

This Certificate is presented to

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K. SINGH COLLEGE

JAPLA, PALAMU, JHARKHAND – 822116 (A Permanent affiliated Unit of NPU, Medininagar & Recognized by UGC)

Website - https://akscollege.com, Email - akscollege84@gmail.com

Best Practice -1

TITLE: - A Social Awareness Campaign by N.S.S. Unit and village adoption.

The main objectives are:

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- To increase community awareness through NSS.
- > To introduce voluntary work.
- To motivate the students for responsible leaders
- To introduce team work in the society.
- > To organise awareness programs for all through NSS.
- > To help and coordinate to others in society.

GOALS:-

- Making the villagers aware of the factors adversely affecting their progress.
- Developing proximity of the college students with the villagers and strengthening bond between them by organizing a special camp by NSS.
- By adopting a village, to maintain consistency in conducting social activities and also to get desired results.

CONTEXT:-

Japla is the Naxal affected and backward area of Palamau district as well as state lharkhand. In the past few decades, the government has launched and implemented various welfare, upliftment schemes and awareness programs for the rural people. But due to lack of awareness, effective execution and result oriented mechanism; the desired goal could not be achieved. The overall progress of the villagers living in remote, and Naxal affected area is still restrained by various factors. Owing to lack of information, ignorance and outreach awareness programmes, life of these villagers is still encircled by various problems. This grim ground reality got reflected when the Geography department conducted a field work and special survey in the village KOIRIYADIH An awareness programme an Illiteracy, health issues related to unhygienic living conditions, alcholaism, superstitious outlook, adherence to traditional modes of farming, negligence towards banking system etc. are some of the issues restraining the progress of the villagers that compelled us to organize an awareness campaign specially targeting these issues to bring about a change in outlook of the villagers. Moreover, such targeted activities would surely be helpful in sensitizing the students to pay back to society and to develop some of the vital skills among them.

OLLEGE

Principal K. Singh College Japla, Palamu

PRACTICE:-

The students of Sociology, Geography department and N.S.S. volunteers conducted a specific survey to collect the responses from the villagers of **KOIRIYADIH** village highlighting their life style and outlook. The analysis of the outcome of the survey helped in selecting the topics of discussion and interaction with the villagers that provided a base for organizing an awareness campaign. A special residential NSS camp was organized at the village Koiriyadih with 100 volunteers, apart from performing their routine activities, started communicating, interacting with the villagers to enhancetheir participation and other activities organized for them. Awareness, like, Nasa mukti, blood donation awareness, literacy awareness, swachhta, awareness, program, and guidance and counselling sessions, entertainment Nukad-Natak programmes wereorganised during special camp. Dr. Rajesh Kumar delivered a lecture on eradication of Superstition-Need of an Hour, aiming at bringing in awareness among the villagers about superstitions and blind faiths. NSS Volunteers and the staff members along with the villagers carried out a cleanliness drive everyday before the beginning of the camp.

EVIDENCE OF SUCCESS:-

- A change in villager's attitude towards cleanness was clearly evident.
- Calls and invitations were received from the villagers to the college to organize more training and guidance sessions on Yoga and Pranayam.
- The participated students appeared more sensitized and motivated as their participation in other social activities, conducted by college enhanced.
- The organizational skill among the students appeared to be enhanced while organizing various programmes in the college.

PROBLEMS ENCOUNTERED:-

- Participation of the villagers was comparatively less during day time owing to their engagement in agricultural activities.
- Attitude of most of the villagers to blame the government machinery for every wrong led to dullresponse in the beginning of the campaign.

O-ORDINATOR

Principal A K. Singh College



A.K. SINGH COLLEGE

Estd. - 1984

JAPLA, PALAMU, JHARKHAND – 822116 (A Permanent affiliated Unit of NPU, Medininagar & Recognized by UGC)

Website - https://akscollege.com, Email - akscollege84@gmail.com

BEST PRACTICE-2 Title : Need of Girls Education

2. Objectives:-

- > To promote education of girls in the society and help them achieve their career goals.
- > To provide equal access and opportunity to girls in learning and to enable them
- > To develop independence, self-reliance and competence among girl students.
- > To develop self-care skills and positive self-esteem among these students.

3. The Context

AK Singh College was established for the development of students. At the time when the college was established, girls were deprived of education but today the college has the highest number of girls and the college keeps making every possible effort for the education of girls. Girls come to the college from near and far off places with a positive attitude for which every teacher of the college encourages them. Work is done with a specific purpose for the girls of this area. The college well realizes that continuous focus on promoting the cause of education among the girls of this border area Aurangabad Bihar and rural area is necessary to fulfill the dream of a society based on equality and equity.

4. The Practice

To empower girls, Women Cell of the college has also been functioning with missionary zeal. The aim of Women cell is to promote a culture of respect and equality for female gender. It is also ensured that sexual harassment is treated as an unacceptable social behavior within the college campus and the society. Internal Complaint Committee, Anti Ragging Cell, and Grievance and Complaint Redress Cell are working actively to ensure the campus environment is free from gender discrimination. For safety and security of girl's student the college is under CCTV surveillance in the campus.

5. Evidence of Success

In the college girl students excel in all the spheres and add to the glory of the college in academics, sports and cultural activities. Our College provides scholarships through e-kalyan to girls students every year.

6. Problems Encountered and Resources Required

Some people from rural backgrounds still hold the opinion that investment in girls' education is completely futile and a waste of money. They think that girls have to travel long distances to reach educational institutions and in the meanwhile they can become a subject of gender based violence.

Such parents are unaware of the value of education for girls in this modern world

-CO-ORDINATOR IQAC A.K. SINGH COLLEGE JAPLA, PALAMU

principal Singh College Japla, Palamu