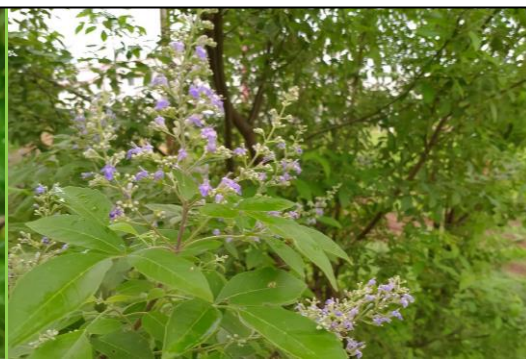


शास्त्रीय कमला देवी राठी स्नातकोत्तर महिला महाविद्यालय राजनंदगांव (दुर्ग)



**Energy Audit, Environmental Audit & Green Audit of
Govt. Kamla Devi Rathi Mahila Post Graduate
Mahavidyalaya, Rajnandgaon**



Conducted & Prepared by

Raj Energy Services,

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....An ESCO empaneled with Bureau of Energy Efficiency, New Delhi

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3. ACKNOWLEDGEMENTS

We express our sincere thanks to Dr. Suman Singh Baghel , Principal for her kind support and giving us the assignment to contribute in their effort towards Green initiatives & efficient energy management in Govt. Kamla Devi Rathi Mahila P.G. Mahavidyalaya, Rajnandgaon, Chhattisgarh.

We are highly indebted to Dr. Omkar Lal Shrivastava, Head- Department of Mathematics , Chairman, Biodiversity Management Committee, Rajnandgaon & Coordinator of Environmental Protection Committee, Govt. Kamla Devi Rathi Mahila P.G. Mahavidyalaya, Rajnandgaon, Chhattisgarh for their guidance, intellectual advice and his kind support in completing the project.

Our boundless gratitude to all teaching and non-teaching staff associated with this Green Audit study of College for extending cooperation during collection of data and field study work.

We trust that the findings of this study will help the college in improving their Green initiative towards creating awareness for healthy and sustainable environment.

Raj Energy Services, Bhilai

Sanjay Kumar Mishra

Certified Energy Auditor, EA- 8696

4. DISCLAIMER

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While every effort is made to ensure that the content of this report is accurate, the details provided "as is" makes no representations or warranties in relation to the accuracy or completeness of the information found on it.

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Nothing in this disclaimer notice excludes or limits any warranty implied by law for death, fraud, personal injury through negligence, or anything else which it would not be lawful for to exclude.

We trust the data provided by the Govt. KDRM P.G. Mahavidyalaya, Rajnandgaon, personnel is true to their best of knowledge.

5. CERTIFICATE



RAJ ENERGY SERVICES

dedicated in energy Conservation

62 & 81, Daya Nagar, Risal, Bhitai Nagar, 490006 (C.G.)
Mob.: 9826179597 Email: resohitai@gmail.com

ENERGY AUDIT, ENVIRONMENTAL AUDIT & GREEN AUDIT CERTIFICATE

This is to certify that M/s. Raj Energy Services has conducted Energy Audit, Environmental Audit & Green Audit of Govt. Kamla Devi Rathi Mahila Post Graduate Mahavidyalaya, Rajnandgaon and submitted report under their Policy for Green Campus of the Institute.

Name of the Educational Institute	Govt. Kamla Devi Rathi Mahila Postgraduate Mahavidyalaya, Kourin Bhata, Rajnandgaon, [C.G.], PIN - 491441
Contact Details	(07744) 225171 E - Mail : kamlacollege.rjn@gmail.com Website : http://www.govtkdmcollegerjn.com
Name of Principal	Dr. Suman Singh Baghel
Details of facilities Audited	Office, All departments, Laboratories, Classrooms, Seminar Halls, Library, Hostel, Electrical Systems and complete Installations including Rain Water Harvesting System etc.
Date of Audit Conducted	13 th , 14 th , 15 th , 16 th & 17 th December 2021
Name of Certified Energy Auditor	Sanjay Kumar Mishra
Registration Number	EA- 8696

For, Raj Energy Services

Date : December 30, 2021

(Sanjay Kumar Mishra)

Certified Energy Auditor from Bureau of Energy Efficiency, Ministry of Power, Government of India, New Delhi
EA- 8696

6. INTRODUCTION

Govt. Kamla Devi Rathi Mahila P.G. Mahavidyalaya Rajnandgaon is a pioneer educational institution imparting higher education to women in whole of Rajnandgaon district. Established in 1963 by Nari Shiksha Samiti in the fond memory of Smt. Kamla Devi Rathi, it was taken over by the State Govt in 1981. Bestowed with the legacy of spreading education it has reached the Milestone of 58th Year with the Increasing strength of 2540 girls students.



Govt. Kamla Devi Rathi Mahila P.G. Mahavidyalaya provides the latest infrastructure facilities that contribute to the academic growth of students and faculty. The campus sprawls over 12.79 acres, which accommodates buildings, the chamber of Principal, Administrative office, Staff Room, Auditorium, Classrooms, Laboratories, Language Lab, Seminar Hall, NCC Room, Computer Lab, Smart Class room Washrooms, Central Library, E-library, RUSA room, NAAC & IQAC Room, Conference Hall, Canteen, Sports Hall, Playground, the campus also houses two Girls Hostel.

The college offers undergraduate & postgraduate programmes in Science, Commerce, Home Science and Arts, an undergraduate self-finance course in Microbiology, Eight Post graduate programs, Diploma course in DCA & PGDCA. The College has an open stage in the centre of main building surrounded by classrooms. Girls common room available in new building where students spend leisure time. Washrooms for students are located in every wing. A separate washroom & Ramp facility for physically challenged students is also available.



Govt. Kamla Devi Rathi PG Mahila Mahavidyalaya has a well-equipped Library with latest infrastructure and well-stocked with a good collection of books. The library is automated with bar coded system and operates with SOUL 2.0 software. In the current session 2021 the work of issuing and submitting books to the students is also being done through SOUL. E-library is fully automated with one server for Ten client system with RDP connection.



Govt. Kamla Devi Rathi Mahila P.G. Mahavidyalaya is the only college in the Rajnandgaon district of Chhattisgarh state to have the Post Graduate Classes in Psychology that imparts knowledge of behavioral Science like counseling skills in the students.

The college also have very good sports facility in the college premises. The girls maintains the physical fitness as well as learns the attitude of team spirit and humanity. The Library loaded with a variety of books, journals and magazines, with the facility of N-List that enables the students to upgrade their knowledge in proper way.

Govt. KDR Girls PG College has kept sand buckets for fire safety of the premises



The Computer lab with latest soft-wares and Wi-Fi facilities helps the students to update their knowledge with the latest information. NCC unit of the college trains the girls that how they can make themselves strong, disciplined, and cooperative. The Eco club activities motivate the students to take care of the plants and animals around, study biodiversity, water conservation and maintain the Ecosystem. The spacious class rooms and smart-rooms are well established for conduction of classroom/ internal seminars, group discussions and awareness programs that enable not only the students, but also the faculties for exchange of views and innovative ideas.

The well set laboratories are the best centers for transfer of knowledge through technology- savvy practical. Special awareness programs, sessions and coaching are usually conducted by Career Guidance & placement cell which provides opportunities to the students to move into a proper direction of their careers.



- Psychological Counseling centre strives to fight the depression and anxiety of the students. Premarital counseling center try to help the girls for having proper discussion regarding their marriage plan. It is also very helpful to remove the misconception about married life. Commerce Department

organizes many entrepreneurship and skill development programs/workshops which provide knowledge about the Self-earning establishments along with the implementation of skills, such as cooking, beauty tips, flower decoration, textile designing, food preservation etc.



National Service Scheme (NSS) unit of the college organizes various social, environmental and community based programmes and functions that cultivate the spirit of social services and moral values. MOUs with many educational institutions, Language Societies, and Self help group motivate the students to fulfill their further educational and social needs.

Students are encouraged to share the information about their respective or related subjects through newspaper and magazine cuttings, displayed on the display or notice boards.

Govt. Kamla Devi Rathi Mahila P.G, Mahavidyalaya has received District Green Champion Award Certificate from Ministry of Education, Government of India. **the green cover of the campus is well maintained.**

Govt. Kamla Devi Rathi Girls Post Graduate college is continuously working in the area of Sanitation & Hygiene, Waste Management, Energy Conservation and Greenery . Mahatma Gandhi National Council of Rural Education, Department of Higher Education, Ministry of Education, Government of India has given the Recognition Certificate on 30th August, 2020 for Social Entrepreneurship, Swachhta & Rural Engagement Cell (SES REC) institution.



Adoption of Digital Technologies for teaching and meetings during COVID period

The Covid 19 pandemic has indirectly changed the landscape of education system. COVID-19 accelerated the adoption of digital technologies to deliver education. Education institutions moved toward blended learning and

encouraged teachers and students to acquire technology savvy. Soft technology, online, webinars, virtual class rooms, teleconferencing, digital exams and assessments became common phenomenon, where otherwise we might have merely defined them — or they might have come into practical use a decade later or more. Govt. KDR PG Girls College, Rajnandgaon also has adopted new techniques to streamline and transform the offline classes and seminars to virtual mode. Various webinars are organized by the college during COVID period.. We are showing a snapshot of an International webinar on Emerging Fields in Chemistry: Advances and Application.



**INTERNATIONAL WEB CONFERENCE
ON
EMERGING FIELDS IN CHEMISTRY:
ADVANCES AND APPLICATIONS**

10-11 AUGUST, 2021

Organised By
**Department of Chemistry
Govt. Kamladevi Rathi Girls P.G. College,
Rajnandgaon (C.G.) INDIA**

ABOUT THE HOST INSTITUTION
The Government Kamladevi Rathi Girls Postgraduate College, Rajnandgaon is a premier higher educational institution for girl students established in 1963 by "Nari Shiksha Samiti" Rajnandgaon in the memory of Mrs. Kamladevi Rathi. Mrs. Rathi donated about 48 acre land and a building beside Rajnandgaon railway station that time in this backward area of Chhattisgarh. This institution was taken over by the Government of Madhya Pradesh in 1981. Now 2311 girls are enrolled in the four faculties - Science, Arts, Commerce and Home Science in which 942 students are enrolled in Chemistry department which is 40.76% of total students of college.

ABOUT THE CHEMISTRY DEPARTMENT
The department is established in 1987. The department has one PG and one UG laboratory with modern scientific equipments and teachers of the department have contributed many research papers previously.



AIMS AND OBJECTIVES OF THE CONFERENCE
The International Web Conference on "Emerging Fields in Chemistry : Advances and Applications " aims to bring together leading scientists and researchers from different universities, institutions and industries across the globe in this pandemic time due to COVID-19.

- In order to foster and conduct collaborative interdisciplinary research, this web conference provides a forum to all core and allied branches of Chemistry for the dissemination and discussion of the most recent advances, innovations, trends, practical challenges encountered and solutions provided in theory and practice of Chemical Science.
- This web conference aims to encourage the research scholars and scientists engaged in these fields.

CALL FOR PAPERS
Original research paper on a topic related to Chemistry and its sub topics given below may be submitted by email to organizing secretary Dr. Dakeshwar Verma on Email id - dakeshwarverma@gmail.com and Convener Dr. Omkar Lal Shrivastava on Email id - omkarlal@gmail.com

SUB TOPICS

• Quantum Dots	• Density Functional Theory
• Nano Materials	• Molecular Simulation
• Super Capacitors	• Organic Synthesis
• Green Chemistry	• Metal Organic Frame Work
• Solar Panel/ Solar Cell	• QSAR
• Carbon Nano Tube	• Docking

DEADLINE FOR ABSTRACT SUBMISSION: 5 AUGUST, 2021

**Full Length Paper Submission - 7 August, 2021
Acceptance Notification - 8 August, 2021**

Registration Form -
Paper and Abstract should be send in MS Word Font size 12 in Times New Roman on Email id - dakeshwarverma@gmail.com & omkarlal@gmail.com

No registration fee is required to participate and present paper in International Web Conference.

Registration Link
<https://forms.gle/7EzW5szJKC8eEK9>

INAUGURAL SESSION
10 August, 2021 | Time - 2.00 - 5.00 PM IST

Chief Guest	Keynote Speaker	Welcome Address
		
Hon'ble Dr. Aruna Palta Vice Chancellor Hannover India University, Durg	Prof. Ibrahim E. Ibrahim Faculty of Applied Science Esa Siba University Al-Morak, Morocco	Dr. Suman Singh Baghel Principal and Patron
Invited Speaker	Paper Presentation on 10 August, 2021 4.00 to 5.00 PM	Invited Speaker
		
Dr. Elyer Berdimurodov Associate Professor Karakalpakstan University Faculty of Natural Science, Nureli City Karakalpakstan Region Nukhulov, Uzbekistan	Dr. Kamlesh Srivas Associate Prof. S&S Chemistry Pt. Ravishankar Shukla University, Raipur	

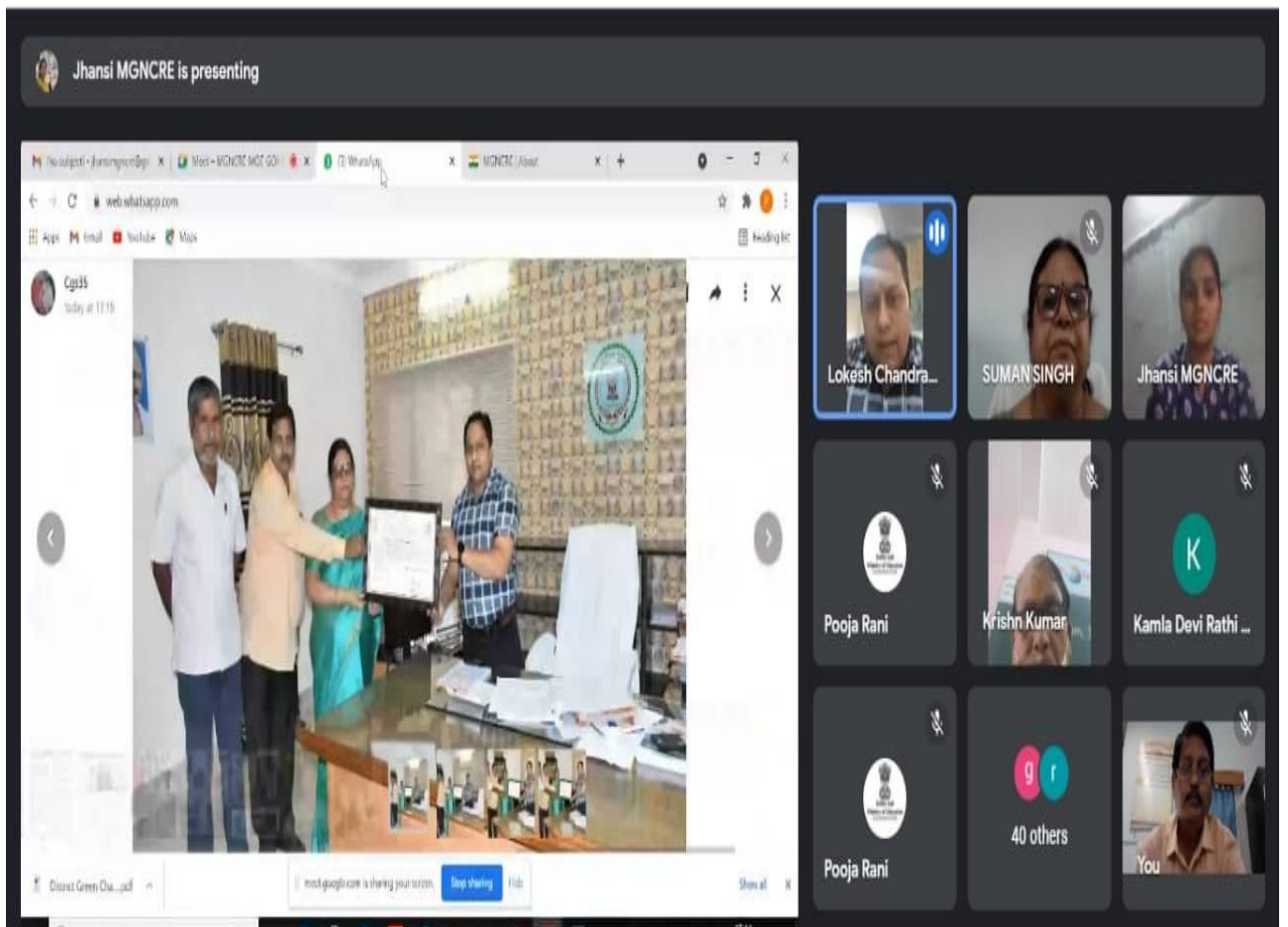
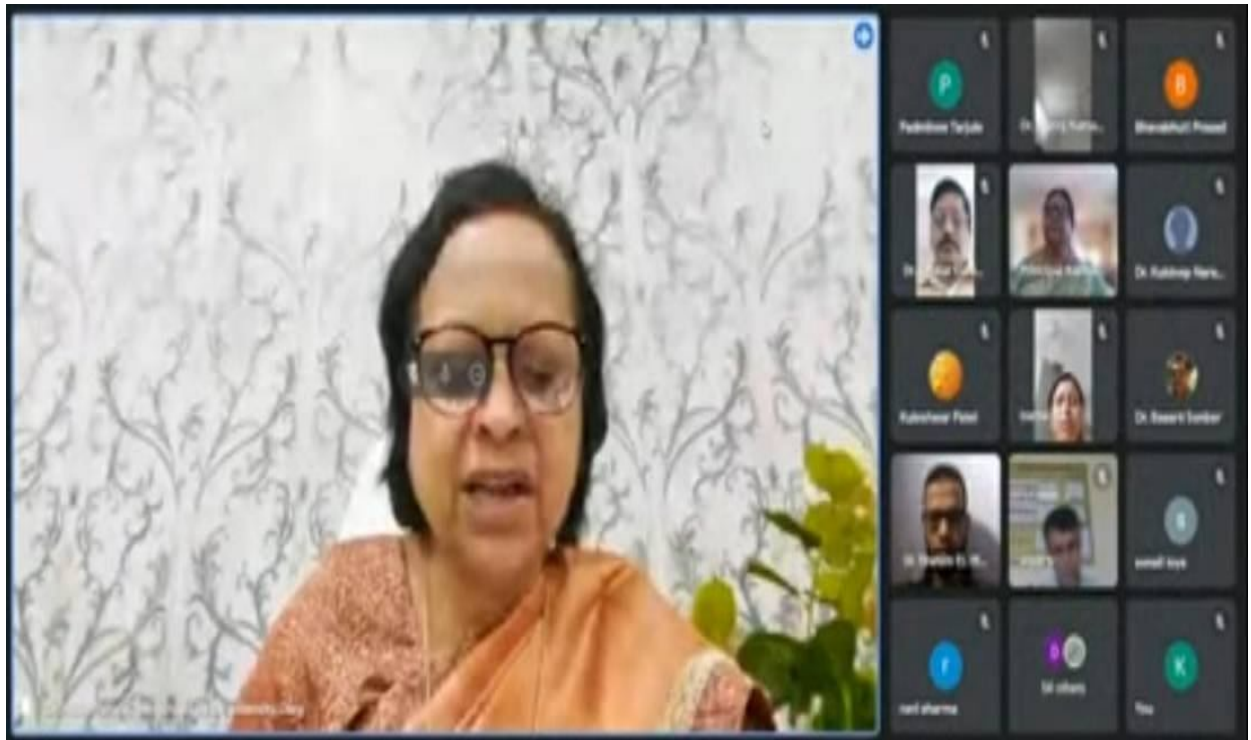
DATE - 11 AUGUST, 2021
(Time - 2.00 PM to 4.00 PM IST)

Invited Speaker	Paper Presentation on 11 August, 2021 3.00 to 4.00 PM	Invited Speaker
		
Dr. Chandrabhan Verma Research Scientist King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia	Prof. Charu Arora Chugh Deputy Head of Chemistry Guru Chhokar Central University, Bhopal	

VALEDICTORY FUNCTION 4.00 to 5.00 PM IST

Chief Guest	Special Guest
	
Hon'ble Prof. S.K. Singh Vice Chancellor Shaheed Mahendra Karma University, Jagdipur	Dr. Hemlata Mohabe Ex. Principal, Govt. Digvijay P.G. College Rajnandgaon

Joint Organising Secretaries Mrs. Sonali Loya Mr. Amit Dewangan Mr. Kaleshwar Patel	Organising Secretary Dr. Dakeshwar Kumar Verma Assistant Prof. Chemistry Govt. Digvijay P.G. College, Rajnandgaon Contact - 7803077674	Convener and Head Chairman Honorary Visiting Professor, Raipur Contact - 9425243656
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7. GREEN AUDIT

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyse 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.

Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

- To introduce and aware staff and students to real concerns of environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use of the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance.

Methodology

We had discussed in detail with Audit Coordinator of college, Dr. Omkar Lal Shrivastava, Astd. Professor & head of the Green Campus Management of college as well as Community/adopted villages for promoting Rural Social Entrepreneurship and Community Engagement. He described about the initiatives of college in the field of water management, waste management, energy management & Green campus management. We also met Eco Club members, staff members and Principal and taken the idea of their action plan in view of Green Audit. We have also met with the different committee head involved in the area of water management, waste management, energy management & Green campus management The discussion was focused on identifying the attitudes and awareness towards energy & environmental issues at the institutional, district, national and global level.

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations.

The study covered the following areas to summarise the present status of Energy , Environment & Green management in the campus:

- Water Management
- Energy Management
- Waste Management
- E-waste Management
- Green Campus Management

- Carbon Footprint

7.1 Water Management

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

Govt. KDR PG Girls College, Rajnandgaon gets water from four pumps. These pumps operates to fulfill the daily water needs of college. College has fourteen Over head water storage tanks each having capacity of 1000 litre. Daily, 20,000 liter of water is pumped to water storage tank.

Source	Water capacity of one OHT	Total nos. of tanks	Total water pumped at one time	Average times of pumping in a day	Total water pumped in aday
College	1000	8	8000	1	8000
Hostel	1000	6	6000	2	12000
Total water supplied to overhead tanks in liter					20000

Table 1 : Total water supplied to overhead tanks

College has not installed Water level indicator/ controller to avoid overflow from water tank. In case of overflow of water from water tanks of college & hostel building, the water is collected in a water pit.

7.1.1 Water Consumption at Govt. KDR PG Girls College, Rajnandgaon

The water consumed in various works like washing, drinking, gardening, canteen, bath, toilet etc.

The details of average water consumption per day is shown in following table:-

Water Audit

Water audit at Govt. KDR Girls PG College, Rajnandgaon					
1	2	3	4	5	6
Activity	Average litres of water used per activity in litres	Number of times activity done each day	Total water used by a person each day (litres)	Number of people in the College using water	Water Consumption per day
Eight Overhead Water Tank Other than Hostel					
Wash hands and face	1.50 litres	One times a day	1.5	300	450
Bath	60-120	once	60	6	360
Toilet flush	6 To 21	once	6	200	1200
Drinking (cup)	0.25	Two	0.5	800	400
Washing dishes (hand)	Basine	Once	1.5	300	450
Overflow of water & Leakage	150	1	140	-	140
Gardening 8 taps	500	once	500	8	4000
Canteen (Av. For 5 people breakfast)	2		2	500	1000
Total Consumption of water in liter (A)					8000
Six Over Head Water Tank kept above Hostel					
Overflow of water& leakage	100	3			300
Hostel (Wash hands and face)	1.50 litres	Two times a day	3	150	450
Hostel (Bath)	60-120	once	60	150	9000
Hostel (Toilet flush)	6 To 21	once	10	150	1500
Hostel Washing dishes (hand)	Basine	Once	2	150	300
Hostel Drinking (cup)	0.25	12 Times	3	150	450
Total Consumption of water in liter (B)					12000
Total water consumption in college [Sum of (A) and (B)]					20000

Table 2 : Total Water Consumption Per Day

There are three water coolers with Aqua-guard /RO facility installed in college which provides clean and hygienic drinking water facility installed.

7.1.2 Rain Water Harvesting System

Rainwater harvesting is a technology used to collect, convey and store rain water for later use from relatively clean surfaces such as a roof, land surface or rock catchment. RWH is the technique of collecting water from roof, Filtering and storing for further uses. Rainwater Harvesting is a simple technique of catching and holding rainwater where its falls. Either, we can store it in tanks for further use or we can use it to recharge groundwater depending upon the situation. RWH system provides sources of soft, high quality water reduces dependence on well and other sources and in many contexts are cost effective.

Rain Water Harvesting System at Govt. KDR Girls PG College, Rajnandgaon

There are total seven numbers of rain water harvesting pits constructed in college. All the rooftop rainwater outlets discharge into storm water drains and then to the recharge Layer of bricks filled inside the recharge well ensures proper filtration of harvested water. Govt. KDR P.G. Girls College, Rajnandgaon has total about 1,00,000 Sq. feet open roof area for rain water harvesting.

Amount of water received through rain

Open roof area (A)	9290 Sq. Meter
Average rain fall per square meter in Bhilai (B)	1000 mm or 1.00 Meter
Amount of water received through rain (C = A x B)	9290 Cu. Meter
Run off Coefficient factor through rain (D)	0.80
Total water received (E =C x D)	7432 Cu. Meter

Table 3: Amount of water received through rain



There are two open water pond, in which overflow water of rain water harvesting pits comes.



7.2 Energy Management

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Govt. KDR PG Girls College, Rajnandgaon uses following energy in the campus:-

- 1) Electricity
- 2) Liquid Petroleum Gas

7.2.1 Electricity

Electricity is supplied by Chhattisgarh State Power Distribution Company Ltd. Govt. KDR PG Girls College, Rajnandgaon Campus has three low tension electricity connections

B.P. No.	Tariff Category	Contract Demand
BP NO. 1000537954	LV2ND3 SG19	17 KW
BP No. 1004946031	LV1DL1SG19	5 KW
BP No. 1006578904	LV2ND3 SG19	18 KW



It is a matter of noteworthy that a new BP connection No. 10006578904 is for hostel purpose and tariff applicable is LV2ND3 SG19. As per tariff schedule of CSPDCL, tariff category LV1 is applicable for hostel.

7.2.2 Electricity Bill Analysis

We have collected & analyzed electricity bills of two years and analyzed.

BP NO. 1000537954

Months	Maximum Demand	Power Factor	Unit Consumption	PF Incentive	Bill Amount (Rs.)
Mar-19			2556		26378
Apr-19	19	0.95	2515	298	25964
May-19			3507		36192
Jun-19	16.48	0.96	3175	420	27447
Jul-19	15.72	0.96	1930	290	16884
Aug-19	19.58	0.96	2648	338	24590
Sep-19	21.28	0.97	3478	403	36175
Oct-19	20.77	0.97	2733	332	28363
Nov-19	18.22	0.95	2440	327	22458
Dec-19			1693		14840
Jan-20	10.7	0.91	1824	182	16179
Feb-20	9.81	0.92	1774	177	15810
Total	16.84		30273		291280
Months	Maximum Demand	Power Factor	Unit Consumption	PF Incentive	Bill Amount (Rs.)
Mar-20			1420		12965
Apr-20	3.99	0.99	751	113	7947
May-20	6.97	0.98	976	146	9680
Jun-20	7.84	0.98	1439	216	13139
Jul-20	7.66	0.98	1482	222	13386
Aug-20	7.35	0.98	2232	335	18951
Sep-20	9.85	0.96	1862	279	16020
Oct-20	9.85	0.96	1555	233	13780
Nov-20			1050		9587
Dec-20	2.41	0.95	712	107	7586
Jan-21	4.36	0.93	730	73	7785
Feb-21	10.42	0.93	1497	150	13453
Total			15706		144279

BP No. 1004946031

Months	Unit Consumption	Bill Amount (Rs.)	Months	Unit Consumption	Bill Amount (Rs.)
Mar-19	512	2611	Mar-20	111	466
Apr-19	673	3432	Apr-20	0	120
May-19	845	4310	May-20	0	2717
Jun-19	497	2209	Jun-20	688	348
Jul-19	710	3675	Jul-20	0	120
Aug-19	948	5444	Aug-20	166	607
Sep-19	628	3091	Sep-20	79	282
Oct-19	630	3106	Oct-20	75	268
Nov-19	632	3140	Nov-20	204	857
Dec-19	987	5802	Dec-20	323	1358
Jan-20	1101	6889	Jan-21	802	4447
Feb-20	158	577	Feb-21	702	3693
Total	8321	44286	Total	3150	15283

BP No. 1006578904

Months	Maximum Demand	Power Factor	Unit Consumption	PF Penalty	PF Incentive	Bill Amount (Rs.)
May-20			0			
Jun-20			0			
Jul-20			286			5245
Aug-20	2.14	0.75	241	84		4644
Sep-20	1.98	0.82	280	98		4925
Oct-20	2.28	0.91	258		26	4636
Nov-20			195			3576
Dec-20	1.93	0.98	209		31	4254
Jan-21	1.76	0.94	232		23	4450

Feb-21	4.71	0.97	328		49	5143
Total			2029	182	129	36873

Table 4: Electricity Bill Analysis

Name	B.P. No.	Tariff Category	Contract Demand	Maximum Demand	Unit Consumption	Annual Unit Consumption
College	1000537954	LV 2ND3 SG19	17 KW	16.84	2523	30276
Old Hostel	1004946031	LV1DL1SG19	5 KW	-	694	8328
New Hostel	1006578904	LV 2ND3 SG19	18 KW	2.5	253	3036
Total Average Monthly Electricity Consumption					3470	41640

7.2.3 Electrical Connected Load :

Lighting, Heating, Ventilation and air conditioning, office equipment and miscellaneous load are connected in college campus & hostel. The details of connected load in college premises and hostel are mentioned below :-

Lighting

Types of Lighting	Equipment	Wattage	Total Quantity	Total load in Watt	Wattage
Energy Efficient Lighting	LED Tube light	20	348	6960	10020
	LED Bulb	15	110	1650	
	LED Panel light	18	38	684	
	LED Street light	55	12	660	
	LED Bulb for Street Light	22	3	66	
Conventional Lighting	CFL Street Light	85	6	510	6030
	Conventional Tube Light	40	138	5520	
Total Connected Lighting Load				16050	

HVAC

Equipment	Wattage	Total Quantity	Total load in Watt
fan	70	404	28280
Exhaust fan	150	18	2700
Air Conditioner 1 T	1000	1	1000
Air Conditioner 1.50 T	1600	2	3200
Air Cooler	250	4	1000
Total Connected HVAC Load			36180

Office Equipments

Equipment	Wattage	Total Quantity	Total load
Computer office/ Lab	70	58	4060
Printer	500	6	3000
Photo Copy Machine	750	4	3000
Refrigerator	400	3	1200
Total Connected Office Equipment Load			11260

Miscellaneous

Equipment	Wattage	Total Quantity	Total load
Water Pump	750	4	3000
Water Cooler	525	3	1575
Sound Box	300	4	1200
Projector	200	1	200
Others			9000
Total Connected Miscellaneous Load			14975

Segment wise Connected Load

Segment	Connected Load
Lighting	16050
HVAC (Air Conditioning & Fans etc.)	36180
Office Equipments	11260
Miscellaneous	14975
Total Connected Load	78465

Table 5: Segment wise Connected Load

The total connected load of Campus is about 79 KW. The maximum share of connected load is in HVAC segment, which is about 46%.

Graphical representation of Connected Load

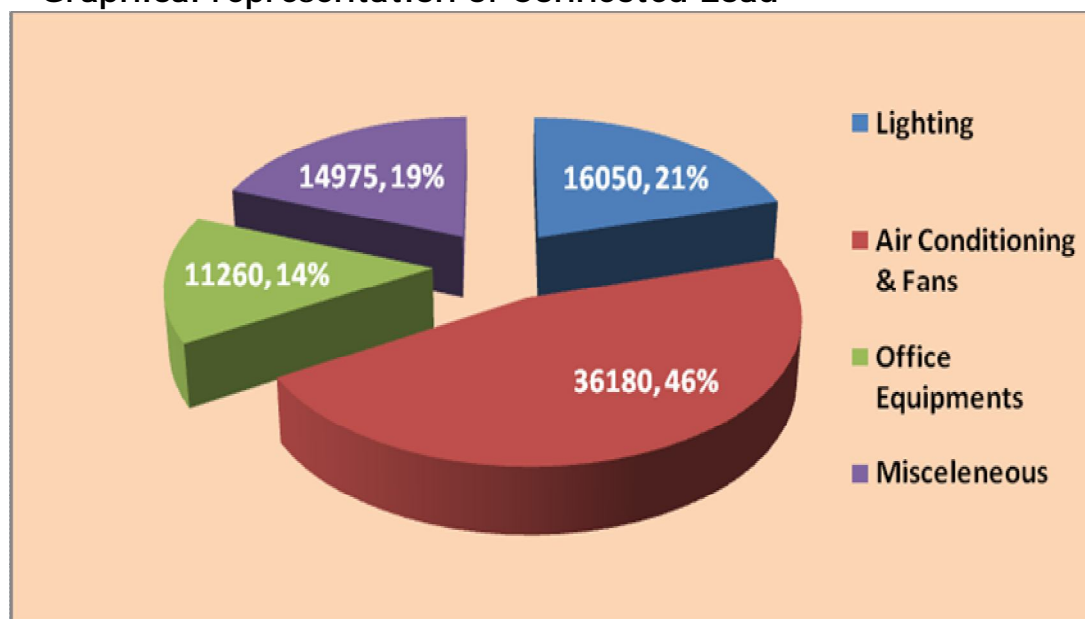


Figure 1 : Graphical representation of connected Load

As per requirement, we have calculated installed load of LED light fittings and Conventional light fittings.

Energy Efficient LED Lighting load in Watt	10020
Conventional Lighting Load in Watt	6030

7.2.4 Percentage of Lighting Power requirement met through LED lights

Energy Efficient LED Lighting load in Watt	10020
Total Lighting Load in watt	16050
Percentage of Lighting Power requirement met through LED lights	62.42 %

Table 6: Percentage of Lighting Power requirement met through LED lights
Thus, total Percentage of Lighting Power requirement met through LED lights is about 63 %.

Graphical representation of Percentage of Lighting Power requirement met through LED lights

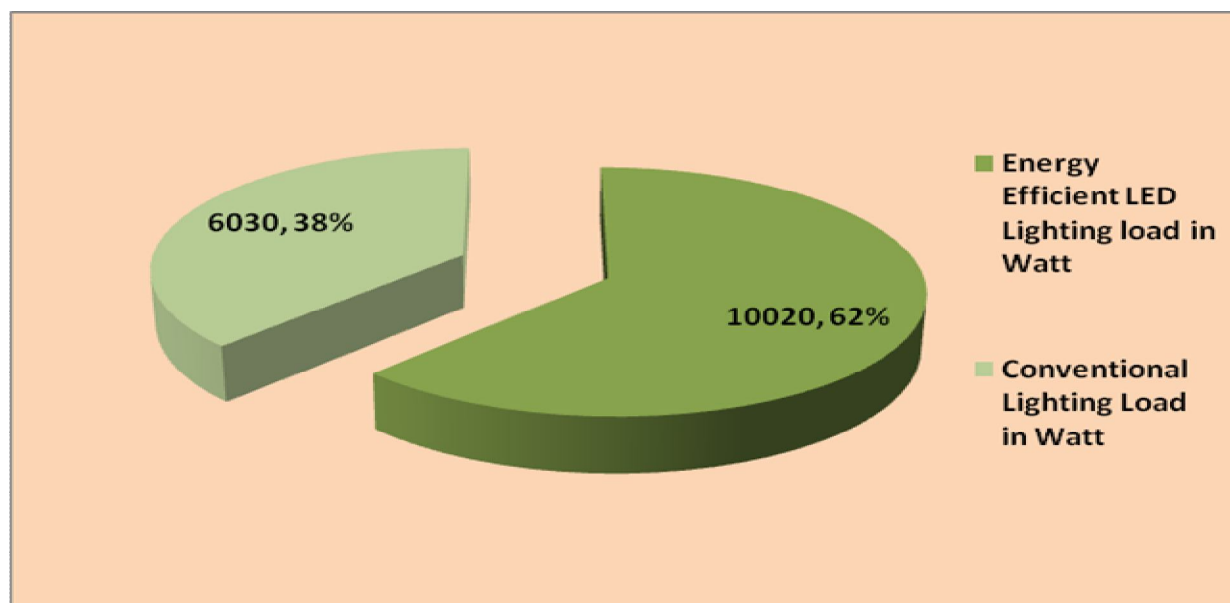


Figure 2 : Graphical representation of Percentage of Lighting Power requirement met through LED lights

The electricity consumed by different segment like lighting, HVAC, Office and miscellaneous equipments are analyzed.

7.2.5 Electricity Consumption

Segment	Electrical Equipment	Watt.	Total Qty.	Hours	No. of Days	Diversity Factor	Annual Unit Consumption
Lighting	LED Tube light	20	348	6	210	0.3	2631
	LED Bulb	15	110	6	210	0.3	624
	LED Panel light	18	38	6	210	1	862
	LED Street light	55	12	12	365	1	2891
	LED Bulb for Street Light	22	3	12	365	1	289
	CFL Street Light	85	6	12	365	1	2234
	Conventional Tube Light	40	138	6	210	0.3	2086
HVAC	fan	70	404	6	180	0.3	9163
	Exhaust fan	125	18	6	180	0.3	729
	Air Conditioner 1 T	1000	1	6	210	1	1260

	Air Conditioner 1.50 T	1500	2	6	110	1	1980
	Air Cooler	250	4	4	110	1	440
Office Equipment	Computer office/ Lab	70	58	6	210	0.3	1535
	Printer	500	6	2	210	0.3	378
	Photo Copy Machine	750	4	1	210	0.5	315
	Refrigerator	400	3	12	210	1	3024
Miscellaneous	Water Pump	750	4	1.5	310	1	1395
	Water Cooler	525	3	7	210	1	2315
	Sound Box	300	4	4	30	1	144
	Projector	200	1	4	25	1	20
	Others						200
Annual Electricity Consumption (A)							34515

Hostel

Segment	Electrical Equipment	Wattage	Quantity	Hours	No. of Days	Diversity Factor	Annual Unit Consumption
Lighting	LED Tube light	20	90	6	240	0.4	1037
	LED Bulb	15	90	6	240	0.4	778
	Conventional Tube Light	40	52	6	240	0.4	1198
HVAC	fan	70	82	6	240	0.4	3306
	Exhaust fan 150	150	7	8	240	0.4	806
Annual Electricity Consumption (B)							7125
Total Annual Electricity Consumption= (A) + (B)							41640

Segment	Annual Unit Consumption
Lighting	11617
HVAC	13572
Office Equipment	5252
Miscellaneous	4074

Total	34515
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Graphical representation of annual unit consumption of College premises

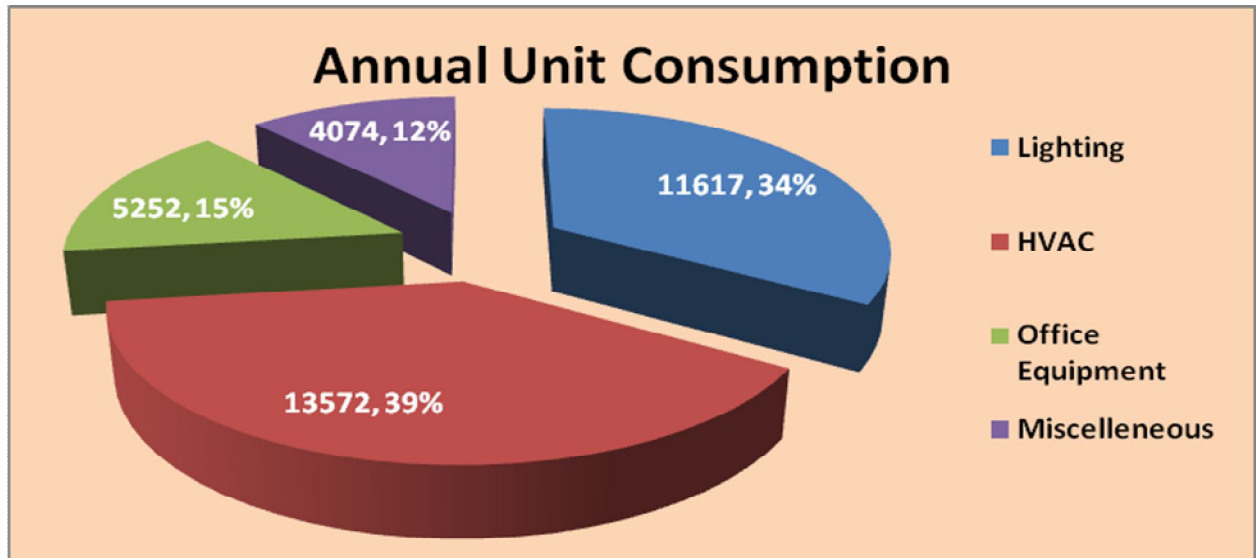


Figure 3: annual unit consumption of College premises

Hostel

Segment	Annual Unit Consumption
Lighting	3013
HVAC	4112
Total	7125

Graphical representation of annual unit consumption of hostel

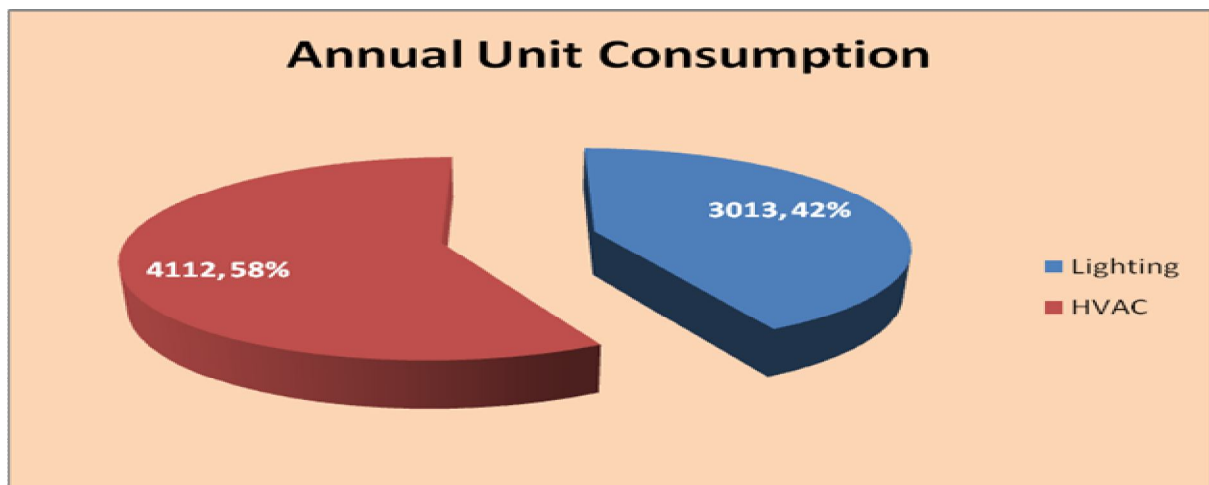


Figure 4 : unit consumption of hostel

Total Annual Unit Consumption of College including hostel

Segment	Annual Unit Consumption
Lighting	14630
HVAC	17684
Office Equipment	5252
Miscellaneous	4074
Total	41640

Table 7 :Annual Unit Consumption of College including hostel

Graphical representation of Annual Unit Consumption of College including hostel

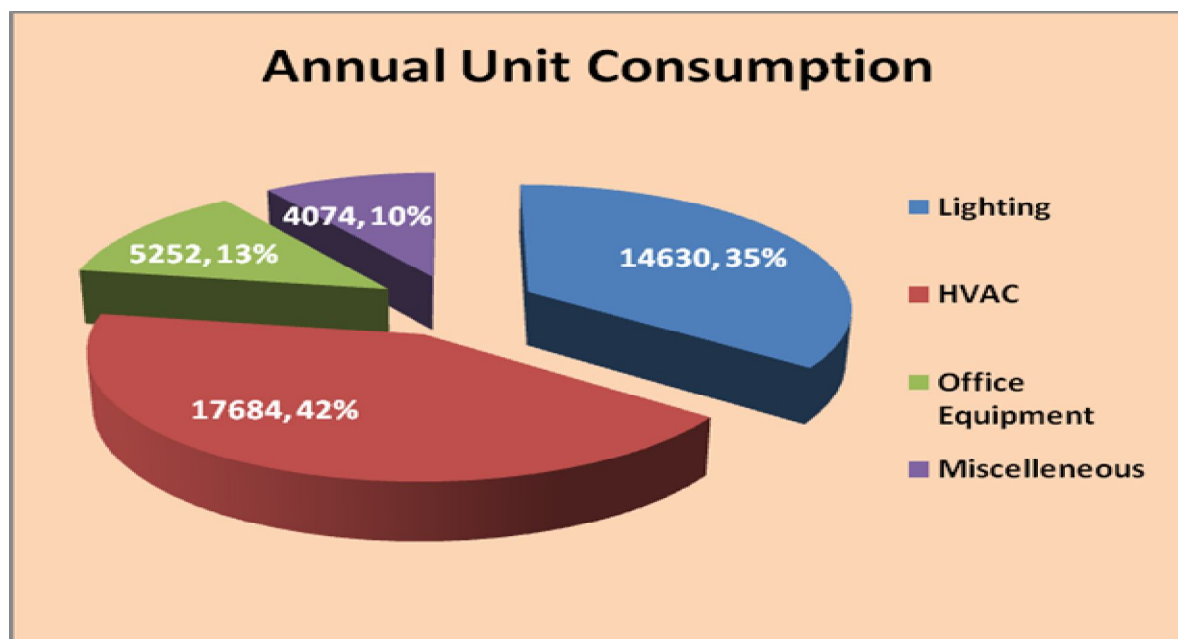


Figure 5 : unit consumption of College including hostel

7.2.6 LPG Consumption in Laboratories

LPG is used in canteen, Hostel mess and laboratory. Total about 728 Kg of LPG is consumed in a year.

Total LPG Consumed in a year	728 Kg
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7.3 Waste Management

This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Municipal solid waste has a number of adverse environmental impacts, most of which are well known and not in need of elaboration. College encourages the process of eco-friendly waste disposal method.

7.3.1 Composting Pit

Girls hostel has the capacity of 150 students. Various waste such as wet waste generated from hostel mess, canteen & Tiffin of students and teachers are used for composting (in composting pit) to form manure and bio fertilizers and further used for organic farming in college campus.

Compost Pit Facility in the College



The size of compost pit is 5' x8'x10'. The quantity of solid organic waste is about 12- 15 Kg per day before COVID period. About 6 packets of organic fertilizer

each having 25 Kg is prepared in 45 days. Thus, a total of about 1200 kg organic fertilizer is prepared in a year.

7.3.2 Solid Waste management

The solid waste is created during routine exercises done in the college, waste items like waste paper, pens, metal pins, strings, detached documents/envelopes, food waste from Canteen are isolated at each source. The city's Safai Workers gather, isolate, and collect the waste in individual dustbins; Green (for biodegradable waste) and Blue (for non-biodegradable waste). These squanders are purged in the respective waste pit. The College has reached the approved organization together this waste on daily basis. Dustbin are placed at various places in the campus including corridor, veranda & Wash Room.

Solid waste can be divided into two categories: general waste and hazardous waste. General waste includes what is usually thrown away in homes and schools such as paper, plastics tins and glass bottles. Hazardous waste is waste that is likely to be a threat to one's health or the environment like cleaning chemicals and petrol. Small bucket and big buckets are used for solid waste.

Waste Bin in the College



Beside this, Eight Big plastic buckets are placed at their designated locations.

Total Production of Solid Waste (Bio degradable) : 5-7 Kg

Total Production of Solid Waste (Non Bio degradable) : 1 Kg (approx.)

There are two septic tanks located near to hostel.

7.3.3 Non Bio degradable Waste – Plastic Bottles / Waste Paper etc.

Non-biodegradable waste like plastics, metal, glass etc. Is collected and taken away by Rajnandgaon Municipal Corporation, Rajnandgaon. Non-biodegradable are those waste, which cannot be decomposed by biological

processes . These are of two types - Recyclable: waste having economic values but destined for disposal can be recovered and reused along with their energy value. e.g. Plastic, paper, old cloth etc. Non-recyclable: waste which do not have economic value of recovery. e.g. Carbon paper, thermocol, tetra packs etc. Disposal of non-biodegradable waste is a major concern, not just plastic, a variety of waste being accumulated. There are a few ways to help non-biodegradable waste management. The impact of non-biodegradable waste on the environment and also focus on its safe disposal for sustainable environment.

7.3.4 Liquid Waste Management

Liquid waste created by the College is of two sorts:

a) Sewage squander. b) Canteen's fluid waste.

The college has a disguised sewage framework including underground septic tanks made of cement. The sewage gushing water is passed inside the disguised waste which associates with the fundamental sewage seepage framework given by the Municipal Corporation. Canteen's fluid waste is gathered into the Liquid Waste Pit. Which increase the water level. Waste water of water point & canteen are being used for watering the plants.

Two water pits for overflow water of rain water harvesting , one for college premises and another for hostel are constructed,

7.3.5 Biomedical waste management:

Being a Girls' College, the major biomedical waste generated on daily basis is used sanitary pads. The used sanitary pads are disposed of by using the Incinerator facility available in the College on daily basis.

. 7.3.6 E-Waste Management

Waste Electrical and Electronic Equipment (WEEE) or E-waste is one of the fastest growing waste streams in the world. In developed countries, it equals 1% of total solid waste on an average Old/obsolete Computer systems, memory chips, motherboards, compact discs, irreparable cartridges etc. generated by electronic equipment such as Computers, Printers, Fax and Photocopy machines are disposed properly. The cartridges of printers are refilled and reused in the campus. UPS Batteries are repaired by the vendor and reused

In developing countries, it ranges from 0.01% to 1% of the total municipal solid waste generation. In countries like China and India, though annual generation per capita is less than 1 kg, it is growing at an exponential pace. Presently, a very small amount of E waste from offices and glass waste from labs is generated in Govt. KDR PG Girls College, Rajnandgaon

The E-waste are usually given to the stores where its parts are used in repairing other system. At present E- waste is kept at a place in computer lab and it is planned to dispose all e-waste through vendor.

The total e-waste kept in college is about 14 Kg.

7.4 Green Campus Management

All plant and animal species - including humans - are linked together in a complex web of life; we depend upon biodiversity for our survival. Biodiversity is the key to healthy ecosystems and ultimately a healthy planet. It keeps the air and water clean, regulates our climate and provides us food, shelter, clothing, medicine and other useful products. Each part within this complex web diminishes a little when one part weakens or disappears.



The trees work hard to keep the air we breathe clean and healthy. They are like sponges. Their leaves take in much of the poisonous unwanted carbon dioxide in the air, and replace it with the oxygen we need for healthy living. This system of absorbing gases on which all plants rely for their food is called photosynthesis.



In this process, the plants with the help of sunlight, water, minerals and the green material called Chlorophyll within the leaves change the carbon-dioxide into food for themselves. When doing this they release oxygen into the air which is vital for all life on earth. At night when there is no sunlight the plant no longer makes food, so it does not release the same amount of oxygen.



One is often told not to sleep with plants in one's room, as they will use up all the oxygen. However, at night although photosynthesis does take place the

plants also rest, so that little oxygen is absorbed from the air and very little harm can be done to the ones sleeping in the room

The roots of trees dig deep into the earth and hold it together so that the rain and wind cannot wash or blow it away. This is very important as the earth has only a very thin layer (seldom more than one foot) of fertile soil covering it. If this is washed, blown or worn away leaving rock or sand on which no plants can grow then the earth would become a desert. The removal of this top-soil is called soil erosion. Scientists, all over the world are trying to find ways to prevent soil erosion. One of the most important ways is creating by planting more trees.





Trees give us food, and juice to drink. Ropes, medicines, wood, paper, and so many other things we use in our daily life, or which are necessary for our health, are made from trees.

Trees send up water vapour into the atmosphere through their leaves. When this vapour meets the cool air above it turns into drops of water which then fall as rain. They give us beauty, colour and greenery. This is something which we often forget and fail to appreciate. They are the homes of many birds, animals and insects. Each of these is important in maintaining the balance of nature.

Particulars of Flora	Numbers
Full grown Tree	310
Semi Grown Tree	222
Quarter grown plants	237

Table 8 : Type and quantity of flora

7.5 Carbon Footprint

A carbon footprint is the amount of greenhouse gases—primarily carbon dioxide— released into the atmosphere by an individual, event, organization, service, or product, expressed as carbon dioxide equivalent. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure our impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created.

A) The following activity/utility is responsible for carbon emission in college:-

- Transportation
- Electricity purchased from Distribution companies.

7.5.1 Carbon Emission by Transportation

Principal, Administrator, teaching & non-teaching staff and students come to college either by two wheelers & four wheelers. The two major fuels used by the transport sector are petrol and diesel. These fuels are carbon intensive as they contain 80-85% of carbon by weight.

Sl. No.	Fuel Used	Types of Transport	Persons	Numbers of Persons	A	B	C	D= C/B	E	F=E x D	G	H=G x F x A
					Nos. of Vehicle Used	milage	Average distance in KM	Fuel Consumed per Day per Vehicle in ltr	Total working days	Petrol Consumption Per Vehicle in a year	Emission factor	Total emission
1	No Fuel	Bicycle	Students	1250	1250	NO FUEL CONSUMPTION						
			Non Teaching Staff	5	5							
2	Petrol	Two Wheeler	Students	300	250	40	20	0.5	176	88	2.67	58740
			Non Teaching Staff	13	13	40	30	0.75	176	132	2.67	4582
			Teaching Staff	20	20	40	20	0.5	176	88	2.67	4699
3	Petrol	Four Wheeler	Teaching Staff	5	5	15	15	1	176	176	2.67	2350
4	Diesel	Auto	Students	150	75	25	30	1.2	176	211.2	2.67	42293
		Bus	Students	100	5	6	40	6.67	176	1174	2.67	15673
Total Co2 emission in KgCo2 eq per Year												128337

Table 9: Carbon emission by transport

Thus, Total Co2 emission is **1,28,337** KgCo2 eq. per Year

7.5.2 Carbon Emission by Electricity

Electricity is taken by grid which uses coal for generating electricity or DG set which uses diesel for electricity generation.

Parameter	Emission Factor (A)	Unit in KWH (B)	Total emission (C= A x B)
Grid Electricity	0.82	41640	34144.8
Total KgCO₂Eq. Emission by Electricity			34145

Table 10: Carbon Emission by Electricity

Thus, total emission by purchased electricity and DG set is 36729 KG CO₂ eq. Per year.

Total Carbon dioxide emission at Govt. KDR PG Girls College, Rajnandgaon

Area	CO2 eq. emission in KG
Electricity	34,145
Transport	128337
Total	162,482

Table 11 : Total Carbon dioxide emission at Govt. KDR PG Girls College, Rajnandgaon

B) The following installation /activity is responsible for reduction in carbon emission:-

- Composting
- Tree plantation

7.5.3 Reduction of Carbon Emission by composting

For producing 1000 Kg of fertilizer 1700 KG of coal is required and which gives carbon dioxide emission of 2500 Kg. Compost has a natural process, thus it reduces carbon dioxide emission, which would be generated in fertilizer.

Particulars	Fertilizer Production in KG	Coal Required in KG	CO2 Emission reduction in KG
Standard Values	1000	1700	2500
In College	200	340	500

Table 12: Reduction of Carbon Emission by composting

Thus, Carbon emission of 500 KG of CO₂eq. Per year is reduced by composting.

7.5.4 Reduction of Carbon Emission due to absorption of CO₂ by Tree Plantation

Planting is a great way to help sequester carbon emissions. Through photosynthesis trees absorb carbon dioxide to produce oxygen, food and wood.

Particulars of Flora	Numbers	Carbon absorption by one tree Per year	Total Carbon Di Oxide in Kg
Full grown Tree	310	6.8	2108
Semi Grown Tree	222	3.4	754.8
Quarter grown plants	237	1.7	402.9
Total Carbon dioxide absorption by trees			3265.7

Table 13 : Carbon absorption by tree plantation

7.5.5 Total Oxygen production by tree plantation

Particulars of Flora	Numbers	Oxygen Production by one tree Per year	Total Oxygen produced in Kg
Full grown Tree	310	117.6	36456
Semi Grown Tree	222	58.8	13053.6
Quarter grown plants	237	29.4	6967.8
Total Oxygen Production by trees			56477.4

Table 14 : Total Oxygen production by tree plantation

8. RECOMMENDATIONS

1) Formation of Energy Club:

We recommend to formation of the Energy Club in Govt. KDR PG Girls College, Rajnandgaon for spreading awareness on the importance of energy conservation. Energy Club will participate in all energy conservation activities and organize program with the support of Chhattisgarh State Renewable Energy Development Agency, (CREDA) Raipur and Bureau of Energy Efficiency, New Delhi.

Objective of Energy Club

The objective of the club is to create awareness among the students, staff and teachers and equip them for efficient management of all forms of energy, to promote energy efficiency and energy conservation. The club will keep to spread "Energy Conservation Messages" in the society by conducting awareness programmes to students and public.

2) Replacement of all conventional tube light will replaced by energy efficient LED tube light:

Govt. KDR PG Girls College shall enhance energy efficiency of the college and replace all conventional tube light with LED light fittings, It should be continue till all conventional tube light will replaced by energy efficient LED tube light. It will not only save in electricity consumption but also to save CO₂ emission directly and indirectly.

Simple Payback Period

Wattage including choke	50
Wattage of LED tube light	22
Saving in wattage	28
Quantity of Conventional Tube light	190
Operating hours	6
Average No. of days in operation	220
Annual saving in unit consumption	7022
Energy Cost in Rs. Per unit	8
Total annual monetary saving in Rs.	56179
Price of one LED 22 Watt tube light	350
Total Investment	66500
Simple Payback period in months	15

Table No 15 .: Simple Payback Period

After replacing conventional tube light with energy efficient LED tube light, there will be an investment of about Rs. 66,500 and annual monetary saving will be about Rs. 56,179. The simple payback of this energy conservation measure is about 15 months.

3. Change of Tariff Category of BP No. 1006578904 in Electricity Bill

Tariff category of Hostel having BP No. 1006578904 should be in LV1 category. LV 2 category has higher tariff than LV1.

1 TARIFF SCHEDULE FOR FY 2021-22

This Tariff Schedule shall be applicable from August 1, 2021.

1.1 Tariff Schedule for Low Voltage (LV) Consumers

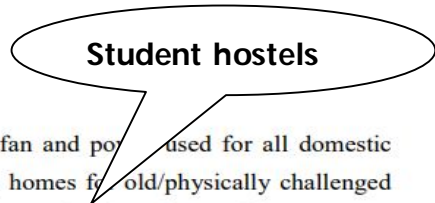
This tariff schedule is applicable to all LV consumers as follows:

- a) Single-phase, 230 Volts up to a maximum connected load of 5 kW (excluding agriculture and industrial consumers), and
- b) Three-phase, 400 Volts for maximum demand up to 112.5 kW in case of demand-based tariff or for maximum contracted load of 150HP in case of other tariff, as applicable.

1.1.1 LV-1: Domestic

Applicability

This tariff is applicable to domestic light and fan and power used for all domestic appliances, in residential premises, orphanages, homes for old/physically challenged people and homes for destitute, dharamshalas, student hostels, working women's hostels, ashrams, offices of National Cadet Core (NCC), public libraries and reading rooms, educational institutions and hospitals (including X-rays etc.) run by charitable



Tariff:

Category of Consumers	Units Slab	Fixed Charge (Rupees per kW)	Energy Charge (Rs. per kWh)
LV-1: Domestic			
Domestic including BPL Consumers	0 -100 units	Rs. 20/- per kW/month for Connected Load up to 5 kW;	3.60
	101-200 units		3.80
	201 - 400 units	Rs. 30/- per kW/month for Connected Load above 5 kW and up to 10 kW;	5.20
	401 – 600 units		6.20
	601 and above units		7.80
	Rs. 40/- per kW per month for Connected Load above 10 kW		

4. Installation of Solar Roof Top Grid Connected Solar Power Plant

It is recommended to install Grid Connected 15 KW Solar Power Plant in college.

In a solar rooftop system, the solar panels are installed in the roof of any residential, institutional, social, Government, commercial, industrial buildings

etc. This can be of two types

- a) Solar Rooftop System with storage facility using battery,
- b) Grid Connected Solar Rooftop System.

In grid connected rooftop or small SPV system, the DC power generated from SPV panel is converted to AC power using power conditioning unit/Inverter and is fed to the grid either of 440/220 Volt three/single phase line or of 33 kV/11 kV three phase lines depending on the capacity of the system installed at residential, institution/commercial establishment and the regulatory framework CSERC in Chhattisgarh State. These systems generate power during the day time which is utilized by powering captive loads and feed excess power to the grid as long as grid is available. In case, where solar power is not sufficient due to cloud cover etc., the captive loads are served by drawing balance power from the grid.

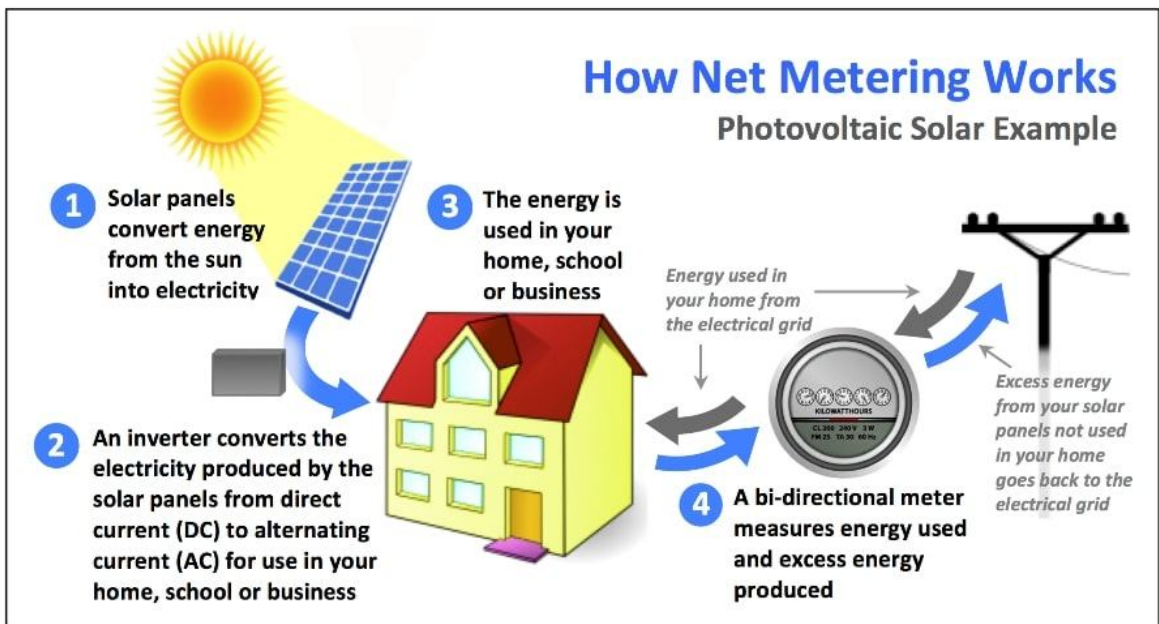


Figure 6 : How Net Metering works

Main components of Solar rooftop system

- Solar PV Modules/Solar Panels – The Solar PV modules/Solar Panels convert solar energy to electrical energy. They are available in different technologies such as crystalline, thin film, CIGS, CdTe, HIT, etc. Crystalline Solar PV panels are most common in use on roof tops.
- Inverter – Inverter converts DC output of Solar PV panels into AC power.
- Mounting structure – The mounting structure, is the support structure that holds the Solar PV panels
- Balance of System – These consist of cables, switchboards, junction boxes, meters, structures, tracking system (if required), earthing system ,circuit breaker, fuses etc.

Models for implementation of Rooftop PV systems

CAPEX Model : Here, the entire system is owned by the rooftop owners and he bears the cost of the Solar system. Responsibility of O&M for the system lifetime (25 years) is also with the rooftop owner. Developer is responsible for installing the system and initial 2 years O&M and five years warranty.

RESCO Model : Here, the entire system is owned by the developer. Responsibility of O&M for the system lifetime (say about 25 years) is also with the developer. Rooftop owners may consume the electricity generated, for which they have to pay a pre-decided tariff on a monthly basis. Excess generation may be exported to the grid, subject to availability of requisite state regulations.

For consumers that have adequate manpower/expertise for O&M, rooftop access concerns, availability of funds upfront, CAPEX model is better.

Consumers in states that have net metering regulations can take benefit of the

same in case they have substantial excess generation.

On the other hand, consumers who prefer not to take responsibility for the system O&M, do not have rooftop security concerns and prefer to pay on a monthly basis rather than bulk upfront payment may choose to go for RESCO model.

Net Metering

The grid connected rooftop system can work on net metering basis wherein the beneficiary pays to the utility on net meter reading basis only. Alternatively two meters can also be installed to measure the export and import of power separately. The mechanism based on gross metering at mutually agreed tariff can also be adopted.



Figure 7 : A Solar roof top system

We are recommending 15 KW of grid connected solar power plant

5)Waste Management: Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations. Composting should be adopted on at least 250 sq. ft. of land

6) Controlled Water Management: Overflowing of water through overhead tank should be installed by installing water level controller at overhead tanks. This will not only save water but also reduce operational time of pump. Gardens should be watered by using drip/sprinkler irrigation system to minimize water use. Leakage of the taps are repaired, It is recommended to install taps with reduced water flow. Since there is no signs of addressing people to turn off water taps in the campus it is recommended to reward the personnel informing Leaky taps, Paste Labels where ever water is expected to be wasted.

7)Enhancement of Energy Efficiency: Cleaning of tube-lights/bulbs to be done periodically, to remove dust over It.

8)Green Campus Management: A Continual plantation of trees is going on. It is recommended to increase the Green Cover further to more area in coming one year.

A continuous practice of the same will helps to conserve energy and natural resources in the campus other practices like landfill waste can be reused, college can increase the number of dustbins targeting the areas with no or less no. of dustbins, waste segregation at the micro level is a necessity; separate bins for recyclable and non-recyclable wastes have to be set up throughout the campus, awareness has to be created among the staff and student through various programmes and policies, emphasis to be laid on – reduce, reuse and recycle.

9.GENERAL RECOMMENDATION FOR ENERGY SAVING IN OFFICE EQUIPMENT

Equipment	Wattage	Comments
CRT Monitor	100 - 120W (during operating condition)	CRT monitors consume a lot of power, much of which is wasted as heat, and represent the largest power consumption component in a typical desktop computer. Emit potentially harmful radiation. Fortunately, most CRT monitors these days are legacy equipment as new computers are generally supplied with LCD monitors. Unfortunately, most CRT monitors end up in landfill.
Desktop Computer	150W (during operating condition)	Power consumption will differ significantly depending on whether a CRT or LCD monitor is used. In home and office situations where it is necessary to run multiple desktop computers, it may be possible to make significant power savings by running a single terminal server computer with several LCD monitors and keyboards attached. Terminal server computers can also greatly simplify network management, software upgrades, etc
Photo copier	7-30W (Sl. Mode) 40-300W (Standby) 200-1300W (op. cond)	Most of the energy used in a photocopier is consumed by the hot rollers, which are usually kept hot on stand-bay, consuming from 40-300W. Significant energy savings (40% to 60%) can be made by ensuring that photocopiers are switched off at night and on weekends. Some photocopiers consume up to 30 watts even when switched off, so photo copiers should be switched off at the power outlet to ensure they are really "off".

LCD Monitor	30-50W (during operating condition)	LCD monitors typically require about 30% of the power required for a CRT monitor with the same screen area. In addition, the amount of heat generated by an LCD monitor is considerably less than a CRT monitor, resulting in a lower load on ACs. Building cooling needs may be decreased by up to 20%.
Inkjet Printer	120W (during operating condition)	Inkjet printers use relatively little power in comparison to laser printers. From an energy consumption point of view, inkjets are preferable to lasers. Unfortunately, they typically cost more to un on a cost -Per -print basis and sometimes produce less than optimum results
Laser Printer	25-80W (Standby) 150-1100W (during operating condition)	Laser printers consume significant amounts of power even when in standby mode. Over the course of an 8 -10 hr working day, a laser printer could consume around 1kWh of energy. On the other hand, laser printers are cheaper to run on a cost-per page basis and generally produce better results. Both the number of laser printers used, and the number of hours the are operated for, should be minimized. As with printing of any kind, office procedures should be developed which minimize the need for printing to paper
Laptop Computer	15-40 W (during operating condition)	Laptop computer power consumption is typically 10% to 25% of that of a desktop computer. In situations such as an office or home office, where computers may operate for 8 to 10 hours a day, this difference is significant and could represent an energy saving of up to 1kWh per day.

10. A GLIMPSE OF AWARENESS ACTIVITIES BY COLLEGE



हरियाली: न्यु यूथ क्लब ने सात सालों में रोपे सौ पौधे, तालाब किनारे बनाए हैं आक्सीजन जैसा माहोल

गांव में स्वच्छता लाने बनाया क्लब, ग्लोबल वार्मिंग को देख पौध-रोपण का भी उठाया बीड़ा, 90 फीसदी पौधों को बना चुके हैं पेड़

पत्रिका न्युन नेतृत्व के

राजनांदगांव, जिला मुख्यालय से दूर किसी दूर ग्राम पर्यावरण के पुर्वाओं ने गांव में स्वच्छता व हरियाली लाने अनोखी पहल की है। यहां के युवाओं ने गांव में स्वच्छता कर पानी को भी प्रेरित करने के लिए 2011 में न्यु यूथ क्लब का गठन किया। गांव में लगाकर सरकारी अभियान चलाने गांव को स्वच्छ-सुधरा बनाया। पहले क्लब का ध्यान और पर्यावरण संरक्षण में पौधरोपण को उन्मुखित कर दिया। इसके बाद युवाओं ने गांव में पौधरोपण करने का निर्णय लिया।



गांव में हरियाली... क्लब किनारे रोपे गए पौधे अब पेड़ बन चुके हैं।

क्लब में 20 से अधिक सदस्य हैं। इन्होंने बैठक कर निर्णय लिया कि गांव में पौधरोपण भी करेंगे।

लेकिन सब अलग-अलग कामों से जुड़े होने के कारण इसके संरक्षण में समय नहीं दे पाने की बात कही, इसके बाद निर्णय लिया गया कि हर साल जितने पौधों को संरक्षित कर पेड़ बनाया जा सकता है, उतने ही रोपेंगे। इसके बाद हर साल 20 पौधे रोपने का निर्णय लिया। 2014 से

हर गांव में हो ऐसा क्लब तो बनेगी बात

पार्टी के ग्रामीण व युवाओं में स्वच्छता व पर्यावरण को लेकर अच्छी जागरूकता है। इस तरह युवाओं की टोली हर गांव में हो सकेगी गांवों को हरा-भरा किया जा सकता है। पौधरोपण व पर्यावरण संरक्षण के लिए जो भी मदद मुझे लेना चाहते हैं, ले सकते हैं।

डॉ. ओंकार लाल श्रीवास्तव, प्रिंसिपल व पर्यावरणविद

पौधरोपण शुरू किया। पांच सालों में गांव में करीब सौ से अधिक पौधे रोपे गए। इनमें से 90 फीसदी पौधों को पेड़ बना लिया गया है। कुछ पौधों को जानवर नुकसान पहुंचाकर तोड़

पर्यावरणविद से ली प्रेरणा और निरंतर बढ़ रहे

क्लब के पूर्व अध्यक्ष अतिथि अधिकारी ने बताया कि क्लब के सदस्य पौधक साहू कमला कॉलेज के प्रोफेसर (पहले दिग्विजय कॉलेज में थे) व पर्यावरणविद डॉ. ओंकार लाल श्रीवास्तव के स्टूडेंट रह चुके हैं। उन्होंने ही सर से प्रेरणा लेकर

गांवों में पौधरोपण के लिए सभी युवाओं को प्रेरित किया। श्रीवास्तव सर ने ही युवाओं को पौधे देकर पर्यावरण संरक्षण के लिए जागरूक किया। सर समय-समय पर गांव पहुंचते हैं और युवाओं द्वारा रोपे पौधों की जानकारी भी लेते हैं।

क्लब में ये शामिल, सुबह-शाम देते हैं समय

क्लब में अध्यक्ष धनेश्वर साहू, उपअध्यक्ष धनेश साहू, सचिव बानू साहू हैं। यही सदस्य के रूप में राकेश साहू, धामेश्वर साहू, अतिथि अधिकारी, मनोज साहू, नकुल यादव, लोकेश राजक, यान्हा, दिवेंद्र

गुजपाल, महेश दास साहू, रवि साहू, दीपक साहू, शीतल साहू, वासुदेव यादव, सुभाष, सुकृत, एकनाथ, उदय दास, हीराना, शीखर, दुर्गेश, राजेंद्र, धनश्याम, आकाश हिमांशु, राहुल व हरीश शामिल हैं।

दिए। इसलिए यह पौधे नहीं बन पाए। यवाओं ने तालाब किनारे व गांव के

खाली जगहों पर पौधे रोपण किया है, जो अब पेड़ बन चुके हैं।

छत्तीसगढ़

रायपुर, 30 अगस्त 2021, सोमवार

कमला कॉलेज को ग्रीन चैम्पियन पुरस्कार

'छत्तीसगढ़' संवाददाता
राजनांदगांव, 29 अगस्त। भारत सरकार के शिक्षा मंत्रालय के उच्च शिक्षा विभाग के महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद् द्वारा शासकीय कमलादेवी स्वातकोत्तर महिला महाविद्यालय राजनांदगांव को डिस्टिक्चर्ड ग्रीन चैम्पियन पुरस्कार दिया गया है।

यह पुरस्कार कोविड के कारण जिला पंचायत सीईओ लोकेश चंद्राकर के मुख्य आतिथ्य में महाविद्यालय की प्राचार्य डॉ. सुमन सिंह बघेल एवं स्वच्छता, ग्रामीण उद्यमिता, ग्रामीण शिक्षा प्रकोष्ठ संयोजक डॉ. ओंकारलाल श्रीवास्तव एवं सदस्य प्रो. आलोक कुमार जोशी को भीतिक रूप से प्रमाण पत्र प्रदान किया गया तथा पुरस्कार राशि रूपए 5 हजार ऑनलाइन रूप से प्राप्त हुआ।

पुरस्कार की घोषणा करते प्रोग्राम को-आर्टिनेटर बी. झांसी रानी ने बताया कि सत्र 2020-21 के लिए भारत के अनेक राज्यों सहित छत्तीसगढ़ के विभिन्न महाविद्यालयों

द्वारा प्रतियोगिता अप्रैल में आयोजित की गई थी। जिसमें कमला कॉलेज यह पुरस्कार पाने वाला छत्तीसगढ़ राज्य का एकमात्र शासकीय महाविद्यालय है। उन्होंने एमजीएनसीआरई के चेयरमैन डॉ. डब्ल्यूजी प्रसन्न कुमार के संदेश का वाचन किया और महाविद्यालय के प्राचार्य, संयोजक सहित समस्त प्राध्यापकों एवं छात्राओं को बधाई दी।

ऑनलाइन कार्यक्रम के मुख्य अतिथि लोकेश चंद्राकर ने जिले के इस एकमात्र महिला महाविद्यालय को पुरस्कार प्राप्त होने पर कलेक्टर की ओर से भी महाविद्यालय की प्राचार्य डॉ. सुमन सिंह बघेल एवं स्टॉफ

तथा छात्राओं को बधाई दी एवं एमजीएनसीआरई ने जिले के महाविद्यालय को पुरस्कार के लिए चयनित करने हेतु जिला प्रशासन की ओर से धन्यवाद दिया।

प्राचार्य डॉ. सुमन सिंह बघेल ने सर्वप्रथम एमजीएनसीआरई भारत सरकार शिक्षा मंत्रालय की पुरस्कार प्रदान करने हेतु धन्यवाद ज्ञापित किया तथा अपना प्रतिवेदन देते कहा कि हमारे महाविद्यालय में प्राध्यापकों, कर्मचारियों एवं छात्राओं की विभिन्न समितियां बनाई जाती है और कॉलेज कैम्पस एवं गोद ग्राम में स्वच्छता, वेस्ट मैनेजमेंट, वाटर मैनेजमेंट, ग्रीनरी मैनेजमेंट तथा एनजी मैनेजमेंट हेतु सतत विभिन्न अकादमिक कार्यक्रम, समीनार वर्कशाप आयोजित किए जाते हैं और भीतिक रूप से भी इन विषयों पर कार्य किया जाता है। जिसमें जिला प्रशासन एवं स्थानीय प्रशासन का सहयोग भी लिया जाता है। जिसके कारण आज हमें यह पुरस्कार प्राप्त हुआ है।

