

# **Green, Energy, & Environment Audit Report**

## **Kittel Arts College, Dharwad**



By,

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## Green, Energy and Environment Audit Report



## Kittel Arts College, Dharwad

  
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Gokhale Centenary College, Ankola



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# GREEN, ENERGY AND ENVIRONMENT AUDIT CERTIFICATE

This Certificate is Presented To

**Kittel Arts College,**  
**Dharwad**

Our team of Environmental Engineers has analyzed Green, Energy, and Environment practices followed by the college.

**PRADEEP NAGAMALLI**  
B.E., M.TECH. (ENV. ENGG.)  
NISARGA CONSULTANTS  
DATE: 25.10.2022



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**Acknowledgement**

We express our gratitude for calling upon us for this audit, mainly the Principal and all other staff members, who were ever helpful and supported us with all the inputs needed for this audit. We thank all the teaching, non-teaching and students for helping us in conducting this audit.

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## **About the Institute**

KITTEL ARTS COLLEGE is the premier institution of higher education in North-Karnataka, welcoming students from all spheres of life, regardless of caste, creed, religion or socio-economic background. The Basel Mission Higher Education Centre is one of the pioneering trusts, which has been quenching the thirst of knowledge since 1840's. In continuation of the same legacy Kittel College was started in 1968 by CSI KND BMHEC in the name of renowned lexicographer Rev.Ferdinand Kittel for imparting quality education. In the year 1988 Kittel College was bifurcated into Kittel Science and Kittel Arts College. Thus Kittel Arts College works with the motto "Not To Be Served; But to Serve". Under the esteemed CSI KND BMHEC Management, there are 04 independent Degree Colleges, 04 Pre-University Colleges, 15 Primary and Secondary Schools and 01 ITI College. Our institution has a lush green, spacious campus of 3.32 acres with built up area of 2994.45 sq. mts situated adjacent to the National Highway and well connected with major cities of the state and country by air, rail and road. It has 14 classrooms, 2 common staff rooms, a ladies room, an office, NCC, NSS, and YRC Wing. It has 2 well equipped laboratories; a library; a language laboratory; ICT enabled classrooms; 2 seminar halls; a gymkhana hall; an auditorium; department of library and information centre is having its own online digital Library [www.kittelartsdigitallibrary.com](http://www.kittelartsdigitallibrary.com) the Kittel Grantha Bhandara with unique collection of literary works and manuscripts of Rev. Ferdiand Kittel and other German missionaries who came to India, rare collection of hand written copy of Indian constitution, which is a star attraction and one of its kind among the institutions in India. Institution has also provided building for a canteen. There are 02 hostels 01 each for girls and boys and 01 staff quarters.

The funding status is Grant-in-aid. University Grants Commission (UGC) has recognized institution under Sections 2(f) and 12(B) and Kittel Arts College Dharwad is permanently affiliated to Karnatak University Dharwad. The college

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spearheads transformation in education with 15 UG Programs. Further, Ministry of Human Resource and Development recognized it under Unnat Bharat Abhiyan 2.0, under which college works towards building a better society through awareness and societal outreach programmes. On its march, college was reaccredited in 2nd cycle, at 'B' grade with CGPA 2.72 by NAAC. Value based education is imparted by observing national and international commemorative days, to groom the overall personality of the students. This in turn has made the college in getting regular University Ranks and University Blues since its inception.

Institution offers undergraduate (UG) programmes in B.A. A total of 743 students are enrolled in various UG programmes in the current academic year. In addition to these programmes, the college imparts skill based education through certificate and value-added courses for enriching students' knowledge.

The College has 12 Permanent Teaching Faculty members out of which 10 members are Ph. D degree holders. During last five years our faculty members have published 43 research papers in peer reviewed journals and have published 14 books.

In the last five years the students of college have been able to get excellent results in the University examinations 11 students acquired ranks 5 Gold Medals, 4 University Blues in sports, 1 NCC Cadet has participated in National RD Parade and 2 NSS volunteers participated State RD parade..

## **Introduction to Green, Energy and Environment Audit**

This audit assists in analyzing environmental practices implemented within the educational campuses, which will result in achieving sustainable goals. Green, Energy and Environment audit comprises of systematic identification, quantification, recording, reporting and analysis of elements of environmental conditions in the premises.

### **Need for Green, Energy and Environment Auditing**

Green, energy, environment auditing is the mode in analyzing and determining whether the institutions' day to day activities are environmentally friendly and sustainable for future generations. Primarily, we are good and efficient users of resources available naturally. Subsequently, excess use of energy, water, have become habitual to everyone.

Green, energy and environment audit provides an approach to check whether

- Our processes are consuming more resources than required?
- Whether we are handling resources carefully?

Continuous monitoring of such processes regulates and gives an efficient way of natural resource utilization.

Recent issues such as drastic climatic changes and depletion of non-renewable resource are of greater concern. To combat such issues at institute/college level, it is needed to check the processes and change them into greener and cleaner one. Green audit also increases overall consciousness among the people working in the institution towards a sustainable environment.

### **Goals of Green, Energy and Environment Audit**

Our team has conducted a green audit with specific goals, such as:

- Recognizing and documenting of green practices followed by the institute.
- Note strength and weakness in green practices presently followed.
- Analyze and suggest solution for the drawbacks identified.
- Evaluate facility of different types of waste management.

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- Increase environmental awareness throughout campus.
- Inspire staff for optimized sustainable use of available resources.

**Objectives of Green, Energy and Environment Audit**

- To inspect the current practices, which can impact the environment.
- To recognize and analyze significant environmental issues.
- Establish and implement Environment Management in various departments.
- Continuous evaluation for betterment of performance in this regard.

**Benefits of Green, Energy, Environment Audit to Educational Institutions**

There are many advantages of green audit to an Educational Institution:

- It would help to protect the environment in and around the campus.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.

## **Executive Summary**

A Green Campus or an Eco-friendly Campus is a place where environmentally friendly practices and education combine to promote sustainable and eco-friendly practices in the campus. It is a campus which is sustainable because of its resource utilization and minimum waste discharge into the environment. Green, Energy and Environmental Audit is an assessment of the extent to which an organization is observing practices which minimize harm to the environment. It assesses the campus performance in complying with applicable environmental laws and regulations. This audit report comprises of observations and recommendations for improvement of environmental conditions in the campus. It mainly focuses on the environmental management plan in the campus with environmental factors like quality of water, ventilation, vegetation, waste management practices, consumption of energy, harmful radiations of the campus, etc.,

For this purpose, to assess the quality of the different environmental factors, samples were analyzed at different places in the campus, viz., water quality, light intensity, air quality, noise pollution and electro-magnetic radiation. The data which was collected were assorted, scrutinized, analyzed and documented. Campus related preliminary interviews with the concerned staff were conducted. Student interaction also was carried out for this purpose. A report based on all these studies with regards to an environmental management plan at the campus with recommendations for further improvement is prepared.



## **Objectives and Scope**

The purpose of this audit was to note that the campus follows environmentally friendly approaches in its regular routine. The implementation of these methods is done in the campus, across all departments, administrative bodies and students and were analyzed.

Following issues were noted during our visit:

- Present conditions at the campus.
- Environmental education through systematic environmental management approach.
- Improving environmental standards.
- Benchmarking for environmental protection initiatives.
- Sustainable use of natural resource in the campus.

Based on the available data, sampling and information provided by the college staff and officials, this report has been prepared and recommendations for betterment of campus environment are provided.

## **Summary of Findings**

The main findings of the audit show that, all the students are aware about the need for environmental protection at a general level. It was also observed that a number of best practices such as water conservation, waste management, cleanliness, waste segregation, plantation, etc., are followed in the campus. There is also NSS unit, actively involved in environment related activities.

### **Infrastructure and college details**

- The college has sufficient infrastructure for curricular and co-curricular activities.
- Rooms - Classrooms, auditorium, department laboratories, library, department rooms, staffrooms, labs, ladies' room etc.
- Sufficient reading materials for students.
- Administrative block such as principal chamber, office room and department rooms.
- Underground and overhead water tanks.
- Computers with internet facilities in office, principal chamber, department rooms and library.
- Classrooms, laboratories and staff rooms in the institute are well ventilated.

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# **Green Cover Details**

## **Green Cover**

Plants and trees are essential for any educational institution. Green cover makes the campus aesthetically pleasing and also helps in providing good environment for the students. Planting saplings and maintaining the same has to be done periodically.

### **Observations:**

This campus has a green area with various plants and trees of different species. The NSS units of the college have been moving a step towards creating a greener campus with different programs and plantation activities. The campus is rich in biodiversity.

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# **Energy Management Details**



**Energy Management:**

Energy management is an important aspect in institutions. Saving of electric power is a major part to minimize the greenhouse gas emissions to the environment. This can be achieved by using 5-star electrical appliances. Renewable energy can be harvested and be used in the campus.

**Observations:**

The energy consumption pattern was examined by verifying electric bills for one year. The bill paid during the period ranged from Rs. 5000 per month to Rs. 9200. Solar panels have been installed on rooftop.

**Recommendations:**

- Solar street lamps can be installed in the campus.

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Power consumption pattern

Month	Meter 1	
	Units	Amount in Rs.
Apr. 2023	481	5084
Mar. 2023	500	5396
Feb. 2023	348	4076
Jan. 2023	1026	7372
Dec. 2022	420	4481
Nov. 2022	525	5966
Oct. 2022	748	3038
Sept. 2022	516	5456
Aug. 2022	1092	2754
July 2022	490	5354
June 2022		9193
May 2022		
Apr. 2022		
Mar. 2022		
Feb. 2022	263	2864
Jan. 2022	304	3196
Dec. 2021	350	8537
Nov. 2021	495	8380
Oct. 2021	296	3334
Sept. 2021	291	2939

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# **Environment Management Details**

## **Water Management**

Quality and Quantity of water is one of the most important parameters in a Green Campus. Water Quality and Quantity differs from place to place depending on the condition of the water source from which it is drawn. Presence of contaminants in the water can lead to health issues of the consumers. Basic monitoring of the quality of water is necessary from the health point of view of the campus occupants. Meticulous Water Management plan of the water available is also imperative for sustainable resource utilization.

### **Observation:**

The main source of water for the campus is bore well and open well supply with sufficient water for the college throughout the year. The water from the borewell is pumped to the overhead tank situated on the top floor of the building and then supplied.

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<b>Sl. No.</b>	<b>Parameters</b>	<b>Response</b>
1	Source of water	Corporation water, bore wells
2	No. of wells	bore wells 1
3	Capacity of tank	10000 Liters
4	Number of overhead tanks	6
5	Capacity of overhead tanks	6000
6	Quantity of water pumped everyday	3000 Liters
7	Waste water sources	NA
8	Use of waste water	NA
9	Fate of waste water from labs	Not Applicable
10	No. of water filters and coolers	04
11	Rainwater harvest available?	Yes
12	No. of units and amount of water harvested	5, 10000
13	Any water saving technique followed	Rainwater harvest and Creating awareness not to waste water in toilets & washrooms
14	Are there any signs reminding people to turn off the water tap?	Yes

## **Waste Management:**

Anthropogenic activities generate waste, and it is the way these wastes are managed and disposed of, which can cause risks to the nature and to health. Waste generated causes pollution which is unpleasing and results in large amounts of litter which in turn cause environmental problems. Solid waste is generally classified into three categories: bio-degradable, non-biodegradable and hazardous waste.

Bio-degradable wastes include food wastes, canteen waste, wastes from toilets, etc.

Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles, etc.,

Hazardous waste is waste that is likely to be a threat to health or the environment like chemicals from research labs, batteries, etc.,

Improper handling of these wastes such as dumping in pits or burning them, may cause harmful discharge of contaminants into soil and water supplies. Special attention should be given to the handling and management of such waste generated in the institutions.

## **Observations:**

In this campus, the waste generated is managed as mentioned below:

Bio-degradable Waste:

- Dry leaves from plants and trees are converted into vermicompost.

Non-Bio-degradable Waste:

- Paper, plastics generated by the campus is collected by the waste collection vehicle of the Municipality.

E-Waste:

- E-Waste is stored in the campus.



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**Recommendations:**

Based on the observations made during our site visit, following recommendations have been made by us:

- Educational posters related to water conservation, waste minimization, waste segregation can be put in the campus to create awareness.

<b>Approx</b>	<b>Biodegradable</b>	<b>Non-biodegradable</b>	<b>Hazardous</b>	<b>Others</b>
Office	0.5 Kg used papers	E-waste	Nil	Nil
Laboratories	Nil	Nil	Nil	Nil
Canteen	Used paper plates, cups etc.	Plastic pet bottles and package materials	Nil	Nil

Composting/vermi-composting	Yes
Recycling	NA
Reusing	Yes
Other ways	Municipality personnel dispose waste

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E-waste	4 Kg/year to 8 kgs/year
Hazardous waste	2 Kg/ year
Solid waste	Includes chalk pieces, waste papers, sanitary wastes, etc. collected and handed over to municipality for safe disposal
Dry leaves	Large quantity used in vermi-composting and used as manure in the garden
Canteen waste	Handed over to municipality on their vehicle
Liquid waste	Used for gardening
Glass	Handed over to municipality for disposal
Unused equipment's	Disposed annually on stock verification and documentation
Napkins	Sanitary incineration device
Others (specify)	--

Do you use recycled paper in the college?	No
Any waste management methods used?	No

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Electronic waste in the institution sent to  
recycler

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Paper waste in the institution sent to  
recycler



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## Air Quality

Air quality plays a major role in day-to-day life. People spend more time indoors. Indoor air quality is the air quality within and around buildings and structures. Indoor air quality is known to affect the health, comfort, and well-being of building occupants. Poor indoor air quality has been linked to sick building syndrome, reduced productivity, and impaired learning in schools and colleges.

### Observations:

Particulate matter was measured in all the classrooms, staff rooms and library. It was observed that the concentrations of PM 1, PM 2.5 and PM 10 were found to be negligible at that instant.

Sl. No.	Room			
		PM 1	PM 2.5	PM 10
1	Office	10	15	19
2	Prayer hall	10	14	19
3	Principal chamber	11	15	21
4	Language room	12	15	18
5	Room No. 1	10	16	18
6	Room No. 2	9	15	19
7	Seminar Hall	11	13	20
8	Room No. 3	9	14	20
9	Room No. 5	10	15	18
10	NSS room	10	15	19
11	Main library	7	15	21
12	Library office	10	14	22
13	Main staff room	11	15	21
14	Geography room	12	14	18
15	Geography lab	11	14	19
16	Sports room	8	16	19



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17	NCC Room	10	18	19
18	Psychology room 1	9	17	20
19	Office	11	16	21
20	Psychology room 2	10	15	22
21	Room No. 6	9	16	21
22	Room No. 7	11	15	21
23	Room No. 8	10	18	22
24	Society	11	17	20
25	Sports	10	16	21
26	Room No. 13	11	14	22
27	Room No. 14	11	18	19
28	Ladies	10	19	19
29	Room No. 11	12	20	18
30	Room No. 12	11	19	18
31	Room No. 9	10	18	19
32	IQAC Coordinator room	11	18	19
33	Computer lab	11	17	19

The readings mentioned above are measured at that instant.

## Light

The main part of the learning process is visual. The classroom is an arena for many activities, such as reading and writing, student or teacher presentations, tests, etc., hence, light plays a major role in classrooms. Well-lit classrooms are utmost essential in colleges. Working desks of the students require a minimum of light of 200 lux. Further, there may be certain zones that require specialized lighting. For example, the area in front of the board should have proper and separately switched presentation lighting.

### Observations:

It was observed that all the classrooms are well lit. The light intensity was observed to be ranging from 250 lux to 350 lux.

Sl. No.	Room	Light intensity in lux
1	Office	260
2	Prayer hall	250
3	Principal chamber	280
4	Language room	280
5	Room No. 1	260
6	Room No. 2	268
7	Seminar Hall	300
8	Room No. 3	310
9	Room No. 5	295
10	NSS room	300
11	Main library	350
12	Library office	260
13	Main staff room	350
14	Geography room	250
15	Geography lab	280

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16	Sports room	290
17	NCC Room	300
18	Psychology room 1	350
19	Office	350
20	Psychology room 2	250
21	Room No. 6	300
22	Room No. 7	300
23	Room No. 8	330
24	Society	300
25	Sports	330
26	Room No. 13	350
27	Room No. 14	330
28	Ladies	350
29	Room No. 11	350
30	Room No. 12	200
31	Room No. 9	300
32	IQAC Coordinator room	300
33	Computer lab	350

## Noise

Noise is unwanted sound considered unpleasant, loud or disruptive to hearing. Unwanted sound is not preferred in any classroom. The Noise levels in the classroom should be below 35 dB in an unoccupied classroom. Higher levels of noise in the classroom may distract the students.

### Observations:

Noise levels were measured in the classrooms and were found to be in the range of 30 dB to 55 dB in an unoccupied classroom. The noise levels in classrooms with students were ranging about 55 dB to 72 dB.

Sl. No.	Room	Noise in decibel	
		Minimum	Maximum
1	Office	35	55
2	Prayer hall	45	72
3	Principal chamber	50	60
4	Language room	45	55
5	Room No. 1	30	40
6	Room No. 2	45	55
7	Seminar Hall	45	60
8	Room No. 3	50	65
9	Room No. 5	45	60
10	NSS room	45	70
11	Main library	50	65
12	Library office	30	45
13	Main staff room	35	45
14	Geography room	30	45
15	Geography lab	35	50
16	Sports room	30	55

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17	NCC Room	40	55
18	Psychology room 1	40	60
19	Office	45	65
20	Psychology room 2	40	70
21	Room No. 6	35	70
22	Room No. 7	30	65
23	Room No. 8	35	60
24	Society	35	60
25	Sports	40	60
26	Room No. 13	40	55
27	Room No. 14	30	55
28	Ladies	40	60
29	Room No. 11	45	65
30	Room No. 12	45	60
31	Room No. 9	30	50
32	IQAC Coordinator room	35	65
33	Computer lab	35	60

## **Electro Magnetic Radiations**

Electromagnetic radiation (EMR) consists of waves of the electromagnetic (EM) field, propagating through space, carrying electromagnetic radiant energy. EMR is generated by electronic devices and constant exposure to EM radiations is not advisable.

### **Observations:**

Electromagnetic radiations were measured in all the classrooms, staff rooms, and library. It was observed that the Electromagnetic radiations were zero in all these places.



## **NSS Activities**

NSS wings of the college conduct various activities related to environment throughout the year.

- Planting the tree and bush saplings has been carried out by Principal, Staff and officials.
- Rainwater harvesting activities.
- Leading to more digital mode of governing, teaching and learning process.
- Making the Campus plastic free.
- Moving towards solar energy as an alternative energy source

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