



**Sahakarbhushan
S.K. Patil College,
Kurundwad**

2023 AUDIT REPORT



**ENVIRONMENTAL & CIVIL
ENGINEERING SOLUTIONS**
ISO 9001: 2015, IEC 17025: 2017



Editorial

In the Era of global warming and climate change every citizen has to reduce their own carbon foot prints to tackle with the adverse impacts of climate change. A green audit of any academic institution reveals ways in which we can reduce energy consumption, water use and reduction in emission of carbon dioxide in the environment. It is a process to look into and ask ourselves whether we are also contributing to the degradation of the environment and if so, in what manner and how we can minimize this contribution and bring down to zero and preserve our environment for future generation.

Sahakarbhushan S.K. Patil College, Kurundwad administration has already taken a step towards the green approach and conducted green audit of campus in the year 2022-2023. As an outcome of this institute has taken green steps to reduce its carbon foot prints by several means in campus viz. sustainable fittings, tree plantation and green computing in the administration and examination. The responsibility of carrying out the scientific green audit was given to Environmental and Civil Engineering Solutions. The organization has followed the rules and regulation of Ministry of Environment and Forest, Govt. of India and Central Pollution Control Board, New Delhi.

A questionnaire was prepared based on the guidelines and format of CPCB, New Delhi to conduct green audit. The information related to consumption of resources like water, electricity and handling of solid and hazardous waste was collected in the formats from main building support services and departments. The data collected was grouped and was tabulated in Excel sheets and analysed. The graphs of the analysed data were prepared for getting quick idea of the status. Interpretation of the overall outcomes was made which incorporates primary and secondary data, references and interrelations within. Final report preparation was carried out using this interpretation to prepare environment management plan of institute for next two years.

During the preparation of the Audit Report Hon. Principal, Dean Academics and IQAC encouraged us with their full support. IQAC and other officers of the institute also gave support to carry out this work. We also thank all Heads of the departments and the Co-ordinators gave full co-operation.



Nikhil N. Kamble
(C.E.O and Head)

**Environmental and Civil
Engineering Solutions**

Acknowledgement

We express our gratitude for calling upon us for this audit, mainly the Director 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.

Green Audit Team

Mr. Nikhil N. Kamble

PhD (Sustainability), M. Tech. (Env. Eng.)

Miss. Maithilee N. Kamble

M.B.A, B. Tech. (Mech. Eng.)

Mrs. Seema N. Kamble

Director, ECS, B. E. (Electrical)



Institutional Audit Committee

Prof. Dr. R. S. Kadam

(Principal)

Dr. S. D. Chavan

(VP and IQAC Incharge)

Dr. P P. Kamble

(Member)

Mr. B. A. Bidkar

(O.S)



1. Introduction:

The modernization and industrialization are the two important outputs of twentieth century which have made human life more luxurious and comfortable. Simultaneously, they are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources and finally making our mother Earth ugly and inhospitable. Today, people are getting more familiar to the global issues like global warming, greenhouse effect, ozone depletion and climate change etc. Now, it is considered as a final call by mother Earth to walk on the path of sustainable development.

Considering the present environmental problems of pollution and excess use of natural resources, Hon. Prime Minister, Shri. Narendra Modiji has declared the Mission of Swachh Bharat Abhiyan. Also, University Grants Commission has mentioned “Green Campus, Clean Campus” mission mandatory for all higher educational institutes. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

Green Audit is the most efficient ecological tool to solve such environmental problems. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area. Through this process the regular environmental activities are monitored within and outside of the concerned sites which have direct and indirect impact on surroundings. Green audit can be one of the initiative for such institutes to account their energy, water resource use as well as wastewater, solid waste, E-waste, hazardous waste generation. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings.

It can also be used to determine the type and volume of waste which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. Green Audit process can play an important role in promotion of environmental awareness and sensitization about resource use. It can create consciousness towards ecological values and ethics. Overall green audit helps the institute to identify areas of improvement and suggest measures to reduce environmental impact and enhance sustainability.



1.1 Need of audit:

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like energy, water, chemicals are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our processes are consuming more than required resources? Whether we are handling waste carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

1.2 Goals of audit:

Institute has conducted an audit with specific goals as:

1. Identification and documentation of green practices followed by college.
2. Identify strength and weakness in green practices.
3. Conduct a survey to know the ground reality about green practices.
4. Analyse and suggest solution for problems identified from survey.
5. Assess facility of different types of waste management.
6. Increase environmental awareness throughout campus.
7. Identify and assess environmental risk.
8. Motivates staff for optimized sustainable use of available resources.

1.3 Objectives of Audit:

1. To examine the current practices which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyse significant environmental issues.
3. Setup goal, vision and mission for Green practices in campus.
4. Establish and implement Environmental Management in various departments.
5. Continuous assessment for betterment in performance in green practices and its evaluation.
6. To prepare an Environmental Statement Report on green practices followed by different departments, support services and administration building.



1.4 NAAC criteria VII Environmental Consciousness:

Institutes are playing a key role in development of human resources worldwide. Higher education institutes campus run various activities with aim to percolate the knowledge along with practical dimension among the society. Likewise different technological problems higher education institutes also try to give solution for issues related to environment. Different types of evolutionary methods are used to assess the problem concerning environment. It includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Carbon Footprint Mapping, Green audit etc

National Assessment and Accreditation Council (NAAC) which is a self-governing organization that declares the institutions as Grade according to the scores assigned at the time of accreditation of the institution. The intention of green audit is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like water and wastewater accounting, energy conservation, waste management, air, noise monitoring etc. for making the institution more eco-friendly.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring natural resources in students. Many environmental activities like plantation and nurturing saplings and trees, Cleanliness drives, Bird watching camps, No vehicle day, Rain water harvesting, etc. will make the students good citizen of the country. Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of Global warming through Carbon Footprint reduction measures.

1.5 Benefits of Green Audit to an Educational Institute:

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

1. It would help to protect the environment in and around the campus.
2. Recognize the cost saving methods through waste minimization and energy conservation.
3. Find out the prevailing and forthcoming complications
4. Empower the organization to frame a better environmental performance.
5. It portrays good image of institution through its clean and green campus.



2. Overview of Institute:

Sahakarbhushan S.K. Patil College, Kurundwad, was established in the year of 2011. Institute has huge area of 1.30 acres and has been serving the mankind in the field of science and technology.



The landscaped grounds of college are widely admired for their beauty. The most valuable investment any educational institution can make is “Nurturing Future Leaders”. With the continuous rise in expectation of essential leadership standards, the institute has torch bearers have taken a responsibility for this investment to nurture the NextGen leaders with a vision to bridge the existing skill gap.

With a firm step forward to attain an academic excellence, several Centres of Excellence, computer labs, and industry-academia associations has been setup at the College in association with the top leaders. The College believes that its primary stakeholders are the students. All aspects of education focus on the core values of contributing to national development while fostering global competencies among students. Methodology:





2.1 Audits to be carried out:

- Green and carbon footprint audit
- Energy audit
- Environmental audit
 - o Water audit
 - o Wastewater audit
 - o Solid waste audit
 - o Ambient noise audit
 - o Ambient air audit





GREEN AUDIT



3. Green and Carbon footprint audit:

Green Audit is the most efficient ecological tool to solve such environmental problems. It is a process of regular identification, quantification, documenting, reporting and monitoring of environmentally important components in a specified area. Through this process the regular environmental activities are monitored within and outside of the concerned sites which have direct and indirect impact on surroundings. Green audit can be one of the initiative for such institutes to account their energy, water resource use as well as wastewater, solid waste, E-waste, hazardous waste generation. Green Audit process can play an important role in promotion of environmental awareness and sensitization about resource use. It can create consciousness towards ecological values and ethics. Through green audit one can get direction about how to improve the condition of environment.

Carbon is the basis of life on mother Earth. It is incorporated into the plants through photosynthesis, consumed by animal species through the food, presents in the form of carbon dioxide (CO_2) the atmosphere, locked into the rocks as limestone and compressed into the different fossil fuels such as coal and oil. As CO_2 level in the atmosphere continue to increase, most climate designs or project that the oceans of the world and trees will keep soaking up more than half CO_2 . The plants on land and in the sea, taken up carbon by over many years increased the percentage discharged during decay, and this increased carbon became locked away as fossil fuels beneath the surface of the planet. The starting of the 21st century brought growing concern about global warming, climate change, food security, poverty and population growth. In the 21st century more carbon has been released into the atmosphere than that has been absorbed. CO_2 is a principle component causing global warming. Atmospheric carbon dioxide levels have increased to 40 % from preindustrial levels to more than 390 parts per million CO_2 . On this background it is a need of time to cover the research areas interrelated with climate change.

3.1 Green Cover at the Institute:

SKPC campus has got a huge green cover and has almost 23 species of vegetation inside the campus. The institute has 1.30 acres of campus and most of this is covered by green area. They have huge plantations along with variation in species Greenery is maintained well by the institute. .





SKPC, Campus (Source: Google Earth Pro)

SKPC has taken huge efforts to develop its green cover. The institute has about 0.30 acres of green cover. In the vicinity of the institute there are about approximately 58 fully grown trees and more than a 19 growing plants. The below table shows some of the common tree species found.

Species	Count	Species	Count
Neem	2	Almond	1
Palms	3	Cherry	2
Mango	5	Papaya	1
Cocount	1	Guava	1
Gulmohar	1	Banyan Tree	1
Seena	8	Lemon	1
Pipal	1	Analstoniascholaris	7
Bauhinia Racemosa	4	Pride of Barbados	1
Tamarind	2	Para Rubber	1
Aavla	1	Basant Rani	1



Mostly there are trees of seena, mango and palmsetc. Due to this the institute has high carbon sequesterial values. Considering the vicinity some dry plants were observed to approximately about 3. Plants absorb sunlight, 50% is absorbed and 30% reflected so this helps to create a cooler and more pleasant climate through a 3°C temperature reduction in the vicinity. This has also led to increase in biodiversity as more than 18 species of birds were observed. Some off the common birds were viz. Sparrow, wild parrots, little stint, black kite etc.

3.2 Carbon Footprint Audit:

SKPC has estimated its carbon footprint by factor methodology. Various factors were used to estimate the carbon emissions from Consumption of electricity, generation of solid waste, use of vehicles in campus, carbon emissions due to human breathing and emissions from buildings. At last they have also calculated Carbon sequesterial value i.e. carbon that is absorbed by the plants.

Sr. No.	Section	Emission
1	Emission from electricity	2930.338 kg CO ₂ eq./year.
2	Emission from solid waste	1534.843 kg CO ₂ eq. per year.
3	Emission from Vehicles	5379.600 kg CO ₂ eq. per year.
4	Emission from human breathing	66.50 tons of CO ₂ eq. per year.
5	Emission from buildings	940.000 kg CO ₂ eq. per year.
6	Carbon sequesterial	3.28 ton CO ₂ eq. per year.

Hence as per the calculation the carbon emission for electricity is 2930.338 kg CO₂ eq./year. Secondly considering emissions from human breathing, the institute has total 1108 students and staff. Considering all the staff viz. junior teachers, senior teachers, Non grant, grant CHB they are total of 41. The staff's works for about averagely 7 hours a day in the institute and the students are present for 6 hours averagely daily. Vehicles emit significant amount of gases in environment and SKPC has various parking sections in the campus. It was found that averagely 65 vehicles entered the institute daily and travel about 200 m of distance from the gate. Cars also enter the institute and as per observation 15 cars are observed daily. Hence, emission from 2 wheelers is 4814.6 kg/km CO₂ eq. considering petrol and diesel cars the emission are 565 kg/km CO₂ eq. Overall the institute emits 5379.600 Kg CO₂ eq. per year. Solid waste is very important as it emits significant amount of carbon through it. SKPC has a good solid waste management system. Hence the institute develops about 775 kg of waste daily in both the form of wet and dry. Overall for a year the generation is about 1534.843 kg



CO₂ eq. per year. Buildings play an important role in carbon contribution. During the construction operation and use phase they emit significant amount of carbon. Hence considering total built-up area the carbon emissions could be evaluated. After the estimation the total built-up area observed was approximately about 4700 sq. m and the carbon emission were 940.000 kg CO₂ eq. per year. Carbon sequesterial in important as it is the carbon absorbed by the trees. SKPC campus has 48 fully grown trees in the campus, hence the sequesterial value is about 3.28 ton CO₂ eq. per year.

3.3 Conclusion:

- Highest carbon emission was observed from human breathing i.e. 66.50 tons of CO₂ eq. per. Year. There is no any significant mean to reduce this number as it is not controllable.
- The next is solid waste. The emission from solid waste comprises of 1534.843 kg CO₂ eq. per year. This can be significantly reduced by following simple means. Waste segregation is properly observed by the institute and they should follow the cut out plastic plans. There should be complete ban in using the plastic inside the campus. There should be minimization of food waste as it contributes highest in carbon emissions.
- Considering emission from electricity they can be significantly reduced by decrease in electricity use. This can be done by installing LED lights and using energy efficient equipment's such as machines with high star ratings which save more. Institute can recognize renewable energy sources and have a setup in the institute. This can lead in significant saving of electricity and reduction in carbon emissions.
- Vehicles have the least emissions in SKPC and it is due to the easy approached parking so that vehicles do not roam in the vicinity. All the vehicles travel hardly 200 m in the campus and this has led to lower emissions. Still institute can follows "NO Vehicle Day" on every 2nd Saturday of each month.
- Institute reduces about 3.28 ton of CO₂ per year by the means of plants. This could be increased by increasing in plantations. SKPC can plant more trees in open ground and at various available sections.
- The plants having highest Carbon sequestration values are suggested. Cinnamomum verum, Eugenia caryophyllid, Bumelia celestina, Acacia Berland Eri, Acacia



Francescana, Chinaberry tree, Moringa oleífer, Carya illusoriness, Pinus Arizonian and Buddleia cordata are some of the suggested species for plantation.



CERTIFICATE

GREEN AUDIT

PROUDLY PRESENTED TO

**Sahakarbhushan
S.K. Patil College, Kurundwad**

Our team of Environmental Engineers have analyzed Clean and
Green Energy practices followed by the Institution,

THIS CERTIFICATE WAS AWARDED BY

**Environmental and Civil
Engineering Solutions**



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ISO 9001:2015, ISO 14001:2015

Seema N. Kamble

SEEMA N. KAMBLE
DIRECTOR

Nikhil N. Kamble

NIKHIL N. KAMBLE
AUDITOR

AUDIT YEAR 2022-2023

