

Report of Green, Environment and Energy Audits



Submitted to

**IDEAL COLLEGE FOR ADVANCED STUDIES,
MALAPPURAM – 679 573, KERALA, INDIA**

Date of Audit: 05.12.2022

Valid Till: 03.12.2025



Submitted by

NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)

[ISO Certified and Ministry of MSME Registered Organization]

No. 2669, LIG-II, Gandhi Managar, Peelamedu

Coimbatore 641 004, Tamil Nadu, India

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 ISO 9001:2015, 14001:2015, 45001:2018 & 50001:2018 Certified and Ministry of MSME Registered Organization
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Dr. S. RAJALAKSHMI, M.B.A., Ph.D., FNSF.,
 Chairman

Mr. P. KANAGARAJ, FNSF.,
 Secretary

Certificate of Declaration

The **Office of Nature Science Foundation**, Coimbatore, Tamil Nadu declare that

1. Nature Science Foundation has conducted onsite green audit at ***Ideal College for Advanced Studies, Malappuram – 679 573, Kerala, India*** by deputing certified Lead Auditors and Technical Experts.
2. On the basis of audit observations by the auditors and pertinent data collected from the Auditee, the Technical Report has been prepared and being submitted.
3. Data presented in the Technical Report are verified and to best of our knowledge, the data are authentic and reliable.
4. Nature Science Foundation declares that data generated were not shared with any third parties and the soft copy of the report is available with Nature Science Foundation's Office.
5. Provided the Auditee desired to publish or share the data with other agencies, Nature Science Foundation has no conflict of interest.

Date: 12.12.2022
 Place: Coimbatore

Authorized Signatory
 Nature Science Foundation

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1. GENERAL INTRODUCTION

1.1. Introduction

Green campus is an area of the Organization or the Organization as a whole itself contributing to have an infrastructure or development that is structured/planned to incur less energy, less water, less or no CO₂ emission and less or pollution free environment. Green Audit is a tool to evaluate environment management system which is systematically executed to protect and preserve the environment. Green audit constitutes the environmental friendly practices and education combined to promote sustenance of green environment by adopting user-friendly technology within the campus. It creates awareness on environmental ethics, resolves environmental issues and offers solutions to various social and economic needs. It strengthens the concept of ‘Green Building’ and ‘Oxygenated Building’ which in turn provides a healthy atmosphere to the stakeholders.

1.2. Environment Friendly Campus

As stated earlier, Organization is liable to provide an eco-friendly atmosphere along with good quality of drinking water facility to all the stakeholders. Manuring the cultivated plants/grown within the campus may applied with organic manure, cow dung, farmyard manure and vermicompost instead of using chemical fertilizers. All non-compostable and single-use disposable plastic items, plastic utensils, plastic straws and stirrers should be avoided. Demonstration / awareness programme on establishing plastic-free environment and utility of organic alternatives for all incoming and current students, staff and faculty should be organized. Reduction of use of papers alternated with e-services, e-circulars, etc., and proper disposal of wastes, recycling and suitable waste management system should be considered to establish environment friendly campus.

The term ‘auditing’ is to examine the management practices and to evaluate performance of an organization in relation to environmental issues. World along with Associated Chambers of Commerce and Industry of India (ASSOCHAM), Green Building Council (IGBC) and Green Ratings Systems (GBCRS), Green Rating for Integrated Habitat Assessment (GRIHA), Bureau of Energy Efficiency (BEE), Leadership in Energy and Environmental Design (LEED), CII-GreenCo –GreenCo Rating System (CII-GRS), Food Safety Management System & Occupational Safety & Health (FSMS), Swach Bharath under India Clean Mission (SBICM) and International Standard Organization (ISO 2021) have formulated a series of standards in the field of environmental auditing. These standards are basically intended to guide organizations and auditors on the general principles common to the execution of environmental audits.

1.3. About Nature Science Foundation (NSF)

NSF is the ISO QMS (9001:2015), EMS (14001:2015), OHSMS (45001:2018) and EnMS (5001:2018) Certified and registered with Ministry of Micro, Small and Medium Enterprise (MSME), Government of India Organization functioning energetically towards the noble cause of nature conservation and environmental protection. NSF is managed by a Board of Trustees which is a Public Charitable Trust registered under the TN Societies registration Act 1975 (TN Act 27 of 1975) on 29th November, 2017 at Peelamedu, Coimbatore 641 004, Tamil Nadu, India with Certificate of Registration No. 114 / 2017. In addition, NSF has 12AA, 80G and Form 10AC certificates for income tax

exemption and implanting various Government schemes. The main motto of the NSF is ‘Save the Nature to Save the Future’ and ‘Go Green to Save the Planet’.

1.4. About the Organization

Ideal College for Advanced Studies

Ideal College For Advanced Studies is one of the prestigious institutions of Ideal Trust, a service motivated organization which was founded by a group of Social Workers, Educationalists and Philanthropists. Since its beginning in 1996, the Trust has been uplifting the society by giving multi faceted education to younger generation in a scientific way. We aim at providing value based quality education and training not only in the respective subjects but also in preparing them for job market with innumerable skill development programmes.

The founders drew their inspiration from the time tested principle of social dynamics which upholds education as the single most effective tool for the emancipation and empowerment of deprived sections for upward mobility. The Ideal International Institute of Education started in 2001, has done exceedingly well in curricular and extra curricular activities with in a short span of time creating a benchmark for institutions of its kind in this part of the state. Besides the consistent performance in academic activities, the school has been a consistent achiever in sports at district, state and national level. For the Ideal Trust, running a college is the logical extension of its avowed mission and is sustained by the same vision, dedication and commitment for excellence in education.

1.5. Audit Detail

- | | |
|--|--|
| 1. Date of Audit | : 05.12.2022 |
| 2. Audit Site | : Ideal College for Advanced Studies,
Malappuram – 679 573, Kerala |
| 3. Inspection Body | : Nature Science Foundation
Coimbatore, Tamil Nadu, India. |
| 4. Audit Scope | : Green, Environment and Energy Audits |
| 5. Name of the Auditing
Chairman | : Dr. S. Rajalakshmi
ISO QMS, EMS and EnMS Certified Lead
Auditor, Founder & Chairman of NSF. |
| 6. Name of the Auditing Team
Leader | : Ms. V. Sri Santhya
ISO QMS, EMS and EnMS Certified Lead
Auditor, Assistant Director & Programme
Manager, NSF. |
| 7. Name of the Lead Auditor for
Green Audit | : Dr. R. Mary Josephine
ISO EMS and EnMS Certified Lead Auditor. |
| 8. Name of the Lead Auditor for
Environment Audit | : Ar. N. M. Pradeep Kumar
ISO EMS and IGBC Certified Lead Auditor. |
| 9. Name of the Lead Auditor for
Energy Audit | : Er. A. Karthik
Bureau of Energy Efficiency Certified Auditor. |

2. GREEN AUDIT

2.1. Introduction

Green audit ensures the Organization's campus should have greenish with large diversity of trees, herbs, shrubs, climbers and lawns to reduce the environmental pollution and soil erosion; it is also useful in relation to biodiversity conservation, landscape management, irrigation/economic water utilization and maintenance of natural topography besides vegetation. For the benefit of stakeholders, solid waste management, recycling of water, disposal of sewage and waste materials (electronic and biomedical wastes), 'zero' use of plastics, single use plastic items, etc. should be followed consistently in the organization campus. Green Audit procedures includes the definition of green audit, methodology on how to conduct green audit at Educational Institutions and Industrial sectors.

2.2. Importance of green audit

The Management of the Organization (Auditee) should be exposed their inherent commitment towards making ecofriendly atmosphere through the green auditing and ready to encourage/follow all types of green activities. A clean and healthy environment will enhance an effective teaching/learning process. They should create the awareness on the importance of greenish initiatives through environmental education among the student members and research scholars. Green audit is the most effective, ecological approach to manage environmental complications (Rajalakshmi *et al.*, 2023). Green audit is a kind of professional care and a simple indigenized system about the environment monitoring in terms of planting more number of trees which is a duty of each and every individual who are the part of economical, financial, social and environmental factors. Green audit is a professional and useful measure for an Organization to determine how and where they are retaining the campus eco-friendly manner. It can also be used to implement the alleviation measures at win-win situation for the stakeholders and the planet. It provides an opportunity to the stakeholders for the development of ownership, personal and social responsibility.



Opening meeting with staff coordinators of Audited Organization

2.3. Green audit observations

- It is observed that the Organization has facilities (ramp walk , Wheelchairs etc.,) for disabled and different age group people.
- Adequate training and awareness programmes are conducted to the Stakeholders for sustainable development at all stages of building life cycle.
- More than 30% of open space is maintained as soft scapes (vegetation) to lower the energy conservation in the campus.
- Land scape design are planned to maintain the natural capacity of the site.
- Land scape irrigation are performed as per the microclimatic condition like during humid / winter season less watering through irrigation is observed.
- Vegetation / vegetative structures are available around the building to reduce energy consumption and maintain indoor climates.
- Garden and green roof system are available to maintain sustainability.

2.3.1. Facilities for Human Comforts

As per the ISO Standards under elements of sustainability quality of plumbing services and buildings are maintained in line with the standard. Ramp walk and Wheel chair facilities are implemented for the benefit of disabled and different age group people.

2.3.2. Natural topography, vegetation and monitoring

Natural topography means the original geographical features and natural resources of the Site. It is observed that the organization has the natural features like rocks, water resources, slopes, landscape, pathways, etc. Vegetation is the cultivation of a bunch of plants irrespective of the plant *taxa* for the covering of the area or ground topography. The observation at the campus indicated that there are more than 40% natural topography and vegetation. Monitoring plan for maintaining the vegetation and sustainability are evident through separate operation and maintenance team & their records for regular watering as per the micro climatic condition through irrigation.



Natural Topography and Vegetation at the Campus

2.3.3. Landscape design and soil erosion control

Landscape design is an important feature for any disasters to control especially with respect to the soil erosion. In general, soil erosion occurs if the design of the land is not altered so as to prevent the slope features by strong vegetation and use of a plant buffer zone as safe for escape of nutrients or fertilizers entering the streams. Observation revealed that the audited site has very good landscape design without

disturbing the natural vegetation. Contour ploughing is being done at right angles to the slope wherever possible and ridges and furrows are properly maintained to break the flow of water down to the empty land. These activities are widely adopted to control soil erosion in the campus. Microclimatic conditions are considered, during winter season irrigation and watering to plants are controlled as per the water management plan. External landscapes are designed based on the shading pattern of the building. Green vegetation are available around the building to reduce the energy consumption.

2.3.4. Establishment of different gardens, vertical landscaping and roof gardens

It is observed that Organization has implemented and maintaining gardens to lower the energy consumption. To maintain certain biomass critical for human health and also to reduce the bio-retention through water flow rates different types of gardens like ornamental garden is implemented in the campus.

2.3.5. Survey of Flora and Fauna

Ensuring the rich biodiversity in the green campus is an important parameter which reflects the real-time ecosystem. In general, plants improve the outdoor air quality with increased oxygen levels and reduced temperature and carbon dioxide. The record on maintenance of the plant biomass and its management are important with respect to green campus initiatives. The existence of such plants and birds in the green campus are recorded for the rich flora and fauna which are being considered as a value addition to the campus.

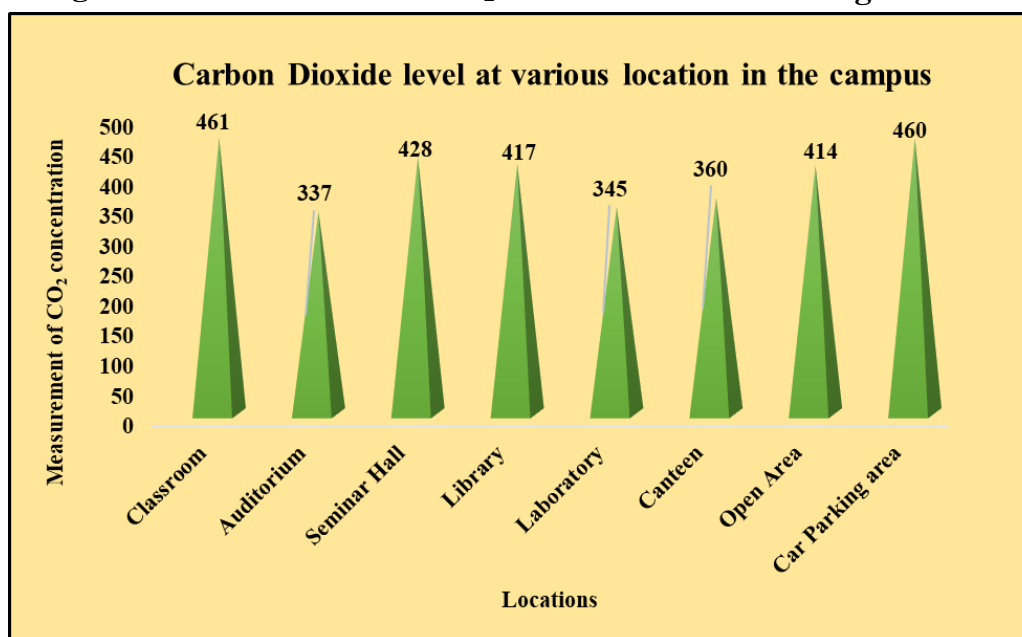
2.4. Air quality audit observations

It is observed that carbon dioxide and oxygen values are acceptable range. The air circulation is very good in all the places which in turn useful to give pure air to the stakeholders. The observation showed that the concentration of CO₂ in the atmosphere is found to be optimal which did not exceed the critical limit of CO₂. It is further revealed that all the selected locations are having pure air without any air contaminants with good air exchange/circulation in the campus. Some of the places like Canteen and Class Rooms are recorded with high level of carbon dioxide level due to student mobilization and the maximum number of electrical items fixed from which the carbon dioxide emission was observed followed by all laboratories and seminar and auditorium halls (Table 1).

Table 1. Measurement of CO₂ concentration in the Organization

S. No.	Different locations of the Organization's Campus	Carbon dioxide level (ppm)*	Remarks
1.	Classroom	461	Within permissible limits
2.	Auditorium	337	Within permissible limits
3.	Seminar Hall	428	Within permissible limits
4.	Library	417	Within permissible limits
5.	Laboratory	345	Within permissible limits
6.	Canteen	360	Within permissible limits
7.	Open Area	414	Within permissible limits
8.	Car Parking area	460	Within permissible limits

Figure 1. Measurement of CO₂ concentration in the Organization



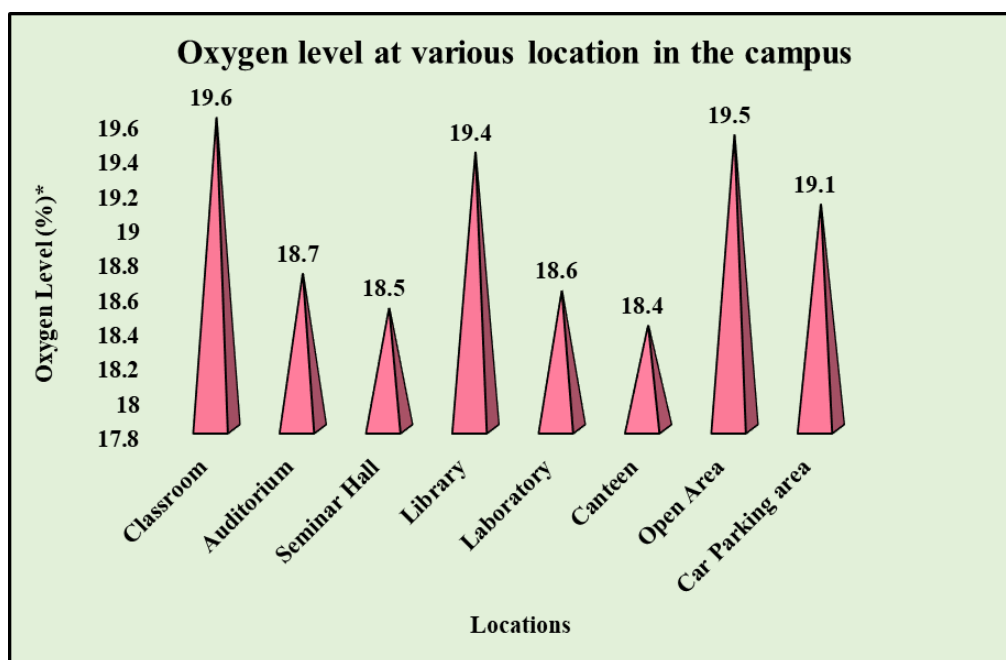
2.5. Atmospheric oxygen level measurements analysis and interpretation

Oxygen level refers to the amount of oxygen available within the atmosphere or water bodies. Oxygen is produced/released as a by-product of photosynthesis, the metabolic activity of all green plants besides certain microbes. Oxygen plays a paramount role in metabolic activities like respiration and the energy-producing chemistry of all living organisms. In order to quantify the oxygen level, Oxygen Meter is used. The atmosphere contains 18-21% oxygen concentration, 75-78.5% nitrogen and 2-3% other gases like carbon dioxide, neon and hydrogen. The amount of oxygen level in the atmosphere is determined by abiotic factors like altitude, latitude and longitude and biotic factors like plantations in the surroundings. If it excess, it causes oxygen toxicity and oxygen poisoning by creating coughing, breathing trouble and damage the lungs to human beings. The oxygen level of different places at the campus are monitored and presented (Table 2).

Table 2. The oxygen concentration at different places of audited organization

S. No	Location	Oxygen Level (%)*	Remarks
1.	Classroom	19.6	O ₂ level is good
2.	Auditorium	18.7	O ₂ level is good
3.	Seminar Hall	18.5	O ₂ level is good
4.	Library	19.4	O ₂ level is good
5.	Laboratory	18.6	O ₂ level is good
6.	Canteen	18.4	O ₂ level is good
7.	Open Area	19.5	O ₂ level is good
8.	Car Parking area	19.1	O ₂ level is good

Figure 2. The oxygen concentration in the Organization



CO₂ and O₂ analysis are observed in the campus