

GREEN AUDIT REPORT

for



KHALSA COLLEGE AMRITSAR

G.T. Road, Amritsar-143002, Punjab (India)



Prepared & Submitted By



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Executive Summary



Executive Summary

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. A clean and healthy environment aids effective learning and provides a conducive learning environment. Educational institutions now a days are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly.

To preserve the environment within the campus, various viewpoints are applied by several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by institutes can also create a variety of adverse environmental impacts. To protect such situation Energy Audit, Green Audit and Environment Audit are required to be conducted in these institutions. Energy Audit paves the way to save energy consequently reducing Carbon Emissions. Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. Green audit is defined as an official examination of the effects an institute has on the environment. It must also be understood that Energy Audit, Green Audit and Environment Audit are inter related to each other. If you save Energy, it will save Environment. If you save trees or plant-trees, it will save Environment and energy. If you clean Environment, it will save human life and save energy.

Eco campus is a concept implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge into the environment. Waste minimization plans for the educational institute are now mandatory to maintain the cleanliness of the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus the conduction of Green Auditing of institution is essential.

The green auditing of Khalsa College Amritsar enables to assess the life style, action and its impact on the environment. This is the first attempt to conduct Environment, Energy and Green auditing of this campus. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil and water, vegetation, waste management practices and carbon foot print of the campus etc. Initially a questionnaire survey was conducted to know about the existing resources of the campus and resource consumption pattern of the students and staffs in the campus. In order to assess the environmental quality, the samples were collected from different locations of the institute and analyzed for applicable

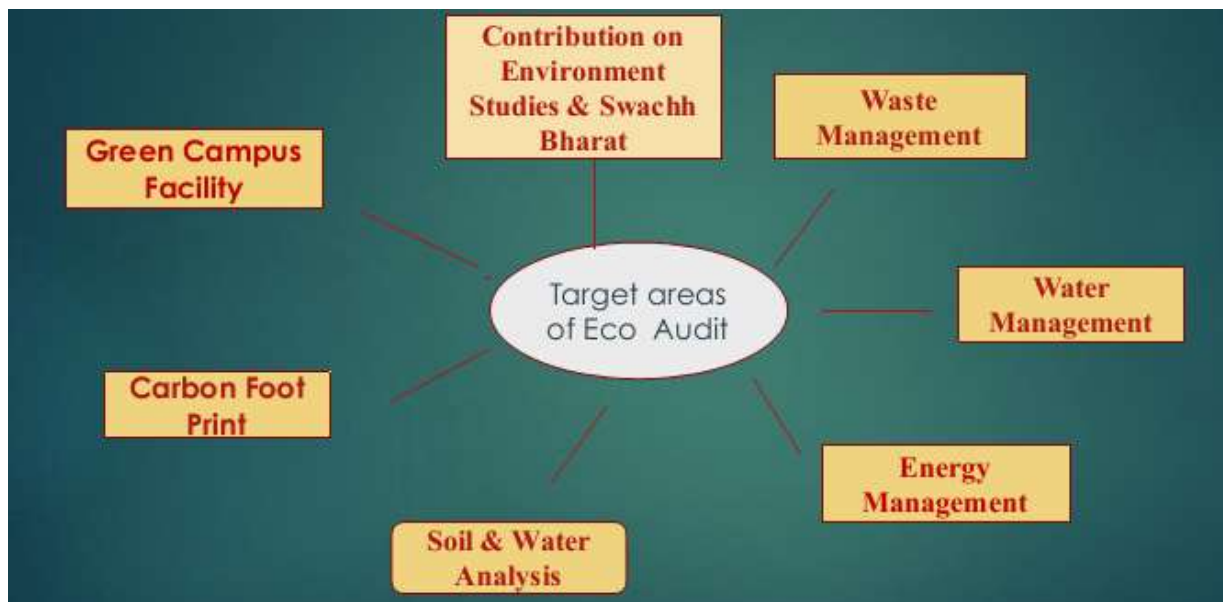


parameters. Finally, a report pertaining environmental management plan with strength, weakness and suggestion on the environmental issue of campus are documented.

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze the environmental practices within and outside the institutional 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. Green Audit has been assigned for the assessment of the institute for internal and self-monitoring purpose.

Thus it is imperative that the Khalsa College Amritsar evaluates its own contributions towards a sustainable future. 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.

Component of Audit





About Khalsa College Amritsar



About Khalsa College Amritsar

Khalsa College, the premier-most institute of higher learning, was established by the leaders of the Singh Sabha Movement in 1892. They were inspired by the lofty ideals of the great Gurus. They planned it to be a growing institution which would strive forever to achieve higher degree of excellence of mind and body for the welfare of the youth. The architectural grandeur of its buildings and layout of its campus clearly demonstrates the will of the founders.

Khalsa College Amritsar is a leading co-educational college of North India celebrating 130 years of academic excellence. It has its own magnificent history. The alumni of Khalsa College have gained name and fame all over the world for themselves as well as for their alma mater. Khalsa College is the epitome of academics, sports and cultural activities. Its building has gained the status of “Heritage” building. This majestic building which looks like a fort and a palace represents the freedom of mind, imbibes moral values and builds scientific temperament. That’s why the students of this college have a unique and distinguished personality. The College was re-accredited with 'A' grade by NAAC (National Assessment & Accreditation Council) in the 3rd Cycle with high CGPA.

Khalsa College, affiliated to Guru Nanak Dev University Amritsar, has been an autonomous college since session 2013-14. Hence, it has the freedom to choose and start new courses, manage its syllabi and examination as per the directions of U.G.C and the affiliating University. The degree is awarded by Guru Nanak Dev University. Beside this, being autonomous is also being responsible for quality education. This is the only college of Guru Nanak Dev University, Amritsar, which performs all such academic exercises. Indeed, this is the only college to introduce internal assessment in all courses. There are around 60 ongoing Undergraduate, Post-Graduate and Research Degree programmes. This co-educational institution has 53% girls students. Khalsa College is a composite institution with six wings consisting of the faculties of Agriculture, Commerce & Business Administration, Computer Science, Humanities and Social Sciences, Natural Science and Physiotherapy.

Spacious in dimension, the main college building is a masterpiece of architecture-a blend of Mughal, Rajput and Sikh Styles. The college campus covers an area of over 330 acres and provides latest amenities of Higher Education. It is flanked by Chemistry, Computer and Physics blocks on western side and Library, Sikh History, Postgraduate, Biotechnology and Canteen blocks in the eastern side. Sikh History & Research Department, that came into being in 1930 contains a reference library and a gallery of thousands of manuscripts, rare books, portraits and paintings of great historical significance and value.



The College is partly residential with five hostels namely Nabha, Faridkot, Hargobind, Jind & New Jind (for boys) and five hostels for girls providing accommodation to 1250 students. The campus also has within its premises a Gurudwara, Gymnasium, Nursery, Fruit Farm, Cricket Stadium, sprawling Playgrounds (Including Athletic Track, Basket Ball, Volley Ball, Football, Hockey and Cricket Grounds) Swimming Pool, Fully Computerized Library, Career Guidance Cell, Placement Cell and Student Activity Centre. Infra structural development in the college is a regular feature. New Buildings of Administration Block, Agriculture, Commerce, Economics, Fashion Designing and Fine Arts Departments, Girls Hostel, Student Cafeteria have been constructed. Newly constructed washrooms for girl students and provision for R.O. filter drinking water in the college and hostels are other highlights

College Profile	
Name of the College	Khalsa College Amritsar
Year of Establishment	March 5, 1892
Location	G.T. Road, Amritsar
Affiliating University	Guru Nanak Dev University, Amritsar.
Total Area of the College	330 Acres
Heritage Building	<ul style="list-style-type: none"> * Composite institution with 6 wings consisting of Faculties of Agriculture, Commerce and Business Administration, Computer Science, Humanities, Social Sciences and Physiotherapy. * Flanked by Chemistry, Physics and Computer Science Blocks on Western Side, Library, Post Graduate, Biotechnology, New Admn. Block and Canteen Blocks on the Eastern side. * 5 Hostels for boys viz. Nabha, Faridkot, Hargobind, Jind & New Jind. * 5 Hostels for girls. * Gurudwara Sahib, Gymnasium, Nursery, Fruit Orchard, Cricket Stadium, Sprawling Playgrounds including Athletics Track, Basket Ball, Volley Ball, Hockey, Cricket Grounds and Swimming Pool. * Fully Computerised and well stocked Library, High Tech. Laboratories, Career Guidance Cell, Placement Cell, e-Governance, Student Activity Centre, Girls Common Room. * Department of Sikh History Research & Museum.
Courses Offered	<p>Research Degree Courses : M.Phil. in Commerce, English, Political Science, Punjabi Post Graduate Courses : M.Sc. Agriculture (Agri. Economics, Agri. Ext. & Communication, Agronomy, Entomology, Fruit Science, Vegetable Science, Plant Pathology, Soil Science & Agri., Chemistry), M.Sc. in Botany, Biotechnology, Chemistry, Food Technology, Fashion Designing, Maths, Physics, Zoology, Comp. Sc., IT, M.Sc.(Hons.) Chemistry, Maths, Statistics, Physics, M.A. in English, Economics, Fine Arts, History, Hindi, Journalism & Mass Communication, Music (Vocal), Punjabi, Political Science, Psychology, Performing Arts (Theatre/Music/Dance), Sociology, Religious Studies, M.Com, Masters in Physiotherapy (Cardiopulmonary, Neurology, Orthopedics) Graduate Courses : B.Sc. (Hons.) Agri., B.Sc. Botany, Biotechnology, Chemistry, Comp. Sc., I.T., Economics, Food Sc. & Tech., Fashion Designing, Medical, Non-Medical, B.Sc. (Hons.) Mathematics, Physics, Chemistry, B.C.A., BPT, Bachelor in Multi Media (4 yrs.), B.Com (Regular), B.Com (Hons.), BBA, B.A. B.A. Social Sciences, Bachelor in Journalism and Mass Comm., B.A.(Hons.) Punjabi, English, B.Voc. (Food Processing, Theatre and Stage craft, Textile Design & Apparel Technology, Software Development), B.A. (Gurmat Teacher Training). UG Diploma Courses : Diploma in Computerised Accounting, DCA, DRM, Diploma in Gatka, Diploma in Nutrition & Dietetics Diploma in Cosmetology, Diploma in Computer Hardware and Network Maintenance, Diploma in Agriculture (2Yrs.), Nursery Management, Commercial Bee Keeping, Mushroom Cultivation, Food Processing, Vegetable Production under Protected Cultivation (1 Year) PG Diploma Courses : PG Diploma in Garment Construction & Fashion Designing, PGDCA, PG Diploma in Financial Services (Banking and Insurance), PG Diploma in Data Sciences.</p> <p>Computerized Accounting software, Event management, Goods and services tax (GST), Web designing, Office Automation, Cutting, Stitching and tailoring, Fabric Painting, Acting and Theatrical Arts, Advanced Photography, Communication Skills & Personality Development, Food and vegetable processing, Dairy products and processing, Devotional Music(Gurbani Sangeet), Instrumental Music (Tabla) Certificate Courses (Free) : Cutting, Stitching, Embroidery and Food Preservation. Community Services : Free Classes for Underprivileged children.</p>
04 M.Phil.	
39 P.G. Courses	
31 U.G. Courses	
16 U.G. Diplomas	
04 P.G. Diplomas	
14 Short Term Certificate Courses	
Life Long Learning Programmes	
Total Number of Teaching and Non Teaching Staff	Teaching : 327 Non-Teaching : 358
Total Number of Students (Session 2021-22)	6433 (Male 3632, Female 2801)
Milestone Achievements	<ul style="list-style-type: none"> • Conferred Autonomous Status by UGC, First Autonomous College under GNDU, Amritsar. • NAAC Re-accredited 'A' Grade (3rd cycle) • Star Status conferred by Dept. of Bio-Tech., G.O.I. New Delhi. • Status of College with Potential for Excellence (C.P.E.) • Received grant of Rs. 1.43 crores out of total Rs. 1.5 crores under CPE scheme(Phase Three).
Alumni	Olympians, Generals, Academicians, Scientists, Theatre Artists and Writers of National and International repute.
Website : www.khalsacollege.edu.in	



Mission and Vision

Established with a specific purpose to rejuvenate Sikh Culture and Language and open up new vistas of scientific and technological education, Khalsa College has justified the faith and trust of its founding fathers by synchronizing tradition with modernity.

The mission of the institute is

- To provide opportunities for educational, vocational, professional, social, linguistic and cultural development to the people of all abilities and backgrounds so that they can discover their potential and fulfill their aspirations.
- To promote morality and sobriety of life, to promulgate and to preach teachings of Ten Gurus as contained in Sri Guru Granth Sahib; to imbibe students of the Sikh faith with idealism and moral disciplines taught by the Gurus and fit them for a way of life that will bring credit to the community and the country; to develop the faculty of meditation and of religious education and to produce worthy citizens of India
- To develop multidimensional personality of the students by providing an opportunity to participate in religious, cultural, co-curricular, theatrical, literary and sports activities.
- To value originality and vision, encourage initiative and promote creativity.
- To instill a sense of pride and achievement of personal accomplishment.
- To promote creativity and value originality.

List of Departments

- Gurmat Study Centre
- P.G. Department of Agriculture
- P.G. Department of Bio-Technology
- P.G. Department of Botany
- P.G. Department of Chemistry
- P.G. Department of Commerce and Business Administration
- P.G. Department of Computer Science & Applications
- P.G. Department of Economics
- P.G. Department of English
- P.G. Department of Fashion Designing
- P.G. Department of Fine Arts
- P.G. Department of Food Science and Technology
- P.G. Department of Hindi
- P.G. Department of History
- P.G. Department of Journalism & Mass Communication
- P.G. Department of Mathematics
- P.G. Department of Music
- P.G. Department of Physics

- P.G. Department of Physiotherapy
- P.G. Department of Political Science & Public Administration
- P.G. Department of Punjabi Studies
- P.G. Department of Zoology
- Sikh History Research Centre
- Skill Development Centre
- U.G. Department of Geography
- U.G. Department of Physical Education
- U.G. Department of Psychology
- U.G. Department of Social Sciences
- U.G. Department of Sociology
- U.G. Department of Theatre Studies

Life at Khalsa College Amritsar



Khalsa College captures overall champion trophy

CHARNJIT SINGH ARORA
 AMRITSAR, DEC 1

The historic Khalsa College, during its 131-year history, has given many precious gems to the nation, who have made a name for themselves, their parents and the college in the society. Whether it is cricketer Bishan Singh Bedi, hockey player Balbir Singh, actor Praveen Kumar, Amarinder Gill, wrestler Kartar Singh, Major Jan Gurbakhsh Singh, Partap Singh Kairon etc. many such diamonds belong to Khalsa College. This view was expressed by Rajinder



Mohan Singh Chhina, Honorary Secretary, Khalsa College Governing Council, on receiving the overall trophy during the Zonal Youth Fair. He said that the government by presenting the name of the organization, district

and parents are shining. Mr. Chhina wished the students to reach future heights on the above achievement. On this occasion, the college principal Dr. Mehal Singh said that Guru Nanak Dev University's 'A' Zone has won the 'A' Division Overall Champion Trophy of the Zonal Youth Fair.

विजेता सचिव राजिंदर मोहन सिंह छिना व प्रिंसिपल डॉ. महल सिंह ने छात्रों की हैसला अफजाई की खालसा कॉलेज ने ओवरऑल चैंपियन ट्रॉफी पर किया कब्जा

विद्यार्थी अपनी-अपनी काबिलियत को मंच पर पेश करके संस्था, जिले व अभिभावकों का कर रहे नाम रोशन

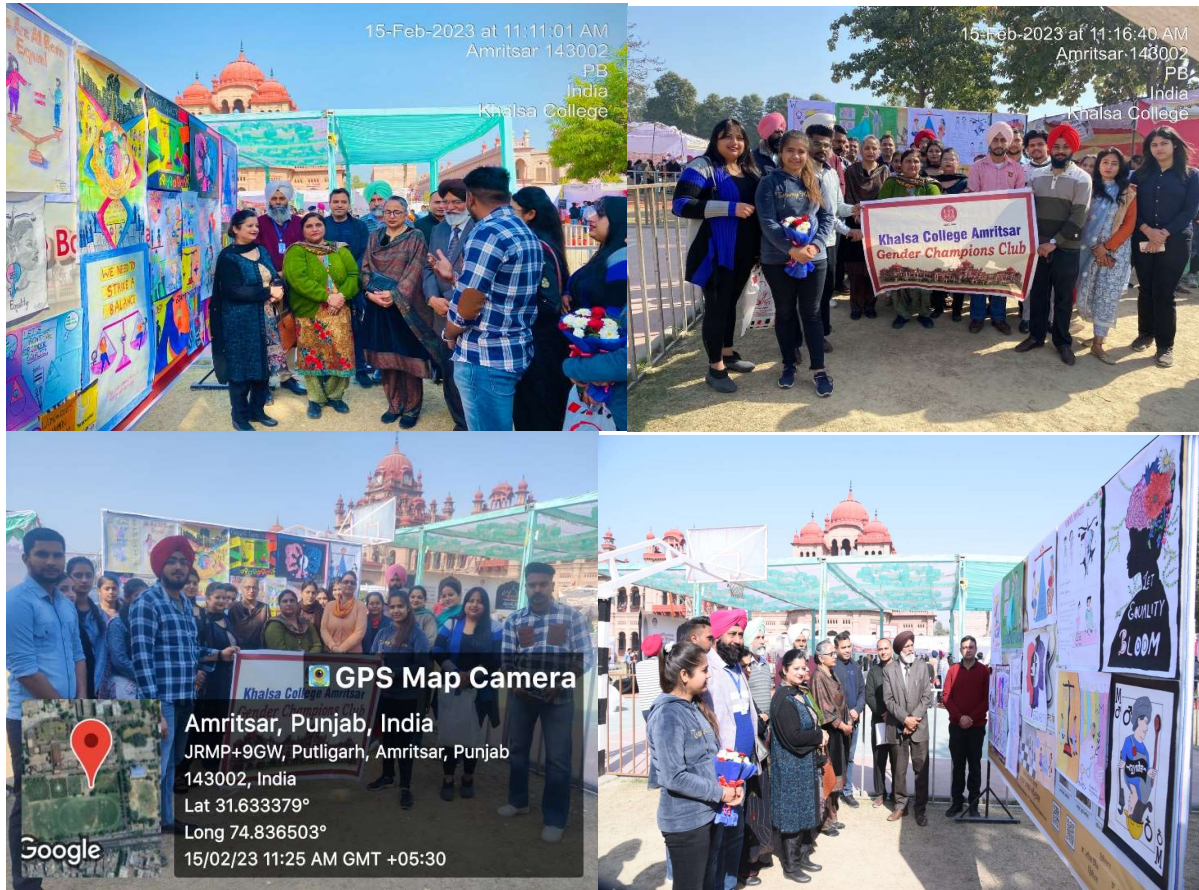


अमृतसर। ऐतिहासिक खालसा कॉलेज ने अपने 131 वर्षीय इतिहास के दौरान देश व कोम को कई अमोल्य धरें प्रदान किए हैं, जिनमें समाज में अपने खास स्थान व क्रांति का नाम रोशन किया है। 'चौधे' यह क्रिकेटर बिलन सिंह बेदी हों, हकी खिलाड़ी बलबीर सिंह, अटकार प्रवीण कुमार, अमरिंदर गिल, पहलवान करार सिंह, मेजर जनरल गुरुबखश सिंह, प्रताप सिंह केते आदि ऐसे कई हीरे खालसा कॉलेज की देन हैं। यह विचार खालसा कॉलेज

गवर्निंग कॉमिटी के अग्रेजी सचिव राजिंदर मोहन सिंह छिना ने ओवरऑल चैंपियन ट्रॉफी पर कब्जा करने पर छात्रों को बधाई देते हुए कहा कि कॉलेज में विद्यार्थियों की ओर से प्रतिस्पर्धा का नाम रोशन कर रहे हैं। छिना ने विद्यार्थियों को उनके उत्कृष्टता पर प्रशिक्षण प्रदान करने का आभार व्यक्त किया। इस अवसर पर कॉलेज प्रिंसिपल डॉ. महल सिंह ने कहा कि

सुर नामक देव यूनिवर्सिटी के ए जेन ओवरऑल चैंपियन ट्रॉफी पर कब्जा करने पर छात्रों को बधाई देते हुए कहा कि कॉलेज में विद्यार्थियों की ओर से प्रतिस्पर्धा का नाम रोशन कर रहे हैं। छिना ने विद्यार्थियों को उनके उत्कृष्टता पर प्रशिक्षण प्रदान करने का आभार व्यक्त किया। इस अवसर पर कॉलेज प्रिंसिपल डॉ. महल सिंह ने कहा कि

Cultural Activities at Khalsa College



Gender Champions Club - Poster Competition on Gender Equality



NCC Activities



NSS Activities



Har Ghar Tiranga Campaign



Divinity Programs



About Green Audit



About Green Audit

Climate change and its impact has brought into focus the need for environmental protection as a global agenda. It has emerged as the pillar for sustainable development of the world. The UN Sustainable Development Goals (SDG's) are an important step in ensuring nation's responsiveness towards environmental protection. The Legal and the policy framework of the country have incorporated many environmental measures, involving all stakeholders in the mission. In this context, the Educational Institution has been responsible and responsive in implementing green practices, such as green plantation, rain water harvesting structures, solid waste management, liquid waste management, e-waste management, solar powered campus, energy conservation etc.

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze the environmental practices within and outside the institutional 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 environment quality with sustainable development and growth. Thus it is imperative that the Khalsa College Amritsar evaluates its own contributions toward a sustainable future. 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.

Scope and Goals of Green Audit

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct green audit in institute/ campus because students become aware of the green audit, its advantages to save the planet and they become good citizens of our country. Thus Green audit becomes necessary at the institute level. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water 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. Green auditing and the implementation of mitigation measures is a win-win situation for the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. Green auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers.

Objectives of Green Audit

The main aim or objective of this green audit is to assess the environmental quality and the management strategies being implemented in the institute. The specific objectives are:

- To assess the quality of the water and soil in the institute
- To monitor the energy consumption pattern of the institute
- To quantify the liquid and solid waste generation and management plans in the campus.
- To assess the carbon foot print of the campus
- To assess whether the measures implemented by the institute have helped to reduce the Carbon Footprint.
- To impart environment management plans of the institute
- Providing a database for corrective actions and future plans.
- To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes.
- To identify the gap areas and suggest recommendations to improve the Green efforts of the institute.

Benefits of Green Auditing

- More efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and managing
- Authenticate conformity with the implemented laws



- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and Improve the environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the Institute and its environment
- Green Audit is an important criteria for self-monitoring and assessment of ongoing activities and further improvements in the institute.

Target Areas of Green Audit

Green audit forms part of a resource management process. Although they are individual events, the real value of green audit is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic value.

All these indicators are assessed in the process of “Green Auditing of this educational institute”. Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute’s energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are

- Water Resource management,
- Waste management,
- Green campus management
- Environment management
- Health and Safety management
- Carbon footprint management

Auditing for Water Management

Water is a natural resource; all living organisms depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available.



Groundwater depletion and water contamination are taking place at an alarming rate. Hence it is essential to examine the quality and usage of water in the institute.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

Water audit has following advantages as

- Water audits provide decision making tools to utility managers, directors, and operators. i.e., knowing where water is being used in your system allows you to make informed decisions about investing resources such as time, labour and money.
- Water audits allow managers to efficiently reduce water losses in the system.
- Reducing water used at the source may even result in delaying or avoiding capital investments such as a new well, more treatment technology or additional water rights.
- Water audits also identify which water uses are earning revenue for the utility and which water uses are not. Thus, System personnel can increase revenue by institute ensuring that all the appropriate uses are being accurately measured and billed. This leads to more financial capacity in the water system, reduced cost per customer and better management of the water resource.
- Creating awareness among water users i.e., customers can see and understand that the utility is taking proactive steps to manage wasted water and save for the future.
- It is an effective educational and public relations tool for the water system.

Auditing for Waste Management

Human activities create waste, and the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Solid waste can be divided into three categories as 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 cleaning chemicals, acids and petrol. Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases



contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the institute. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable institute. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

Auditing for Green Campus Management

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

Auditing for Carbon Footprint

Burning of fossil fuels (such as petrol) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapours, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. Vehicular emission is the main source of carbon emission in the campus, hence to assess the method of transportation that is practiced in the institute is important.



Methodology for Green Audit



Methodology Adopted for Green Audit

The methodology adopted for this audit is comprising of following process steps as

Data Collection

In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements.

Following steps are taken for data collection:

- The team approaches to each department, library, hostel and canteen etc.
- Data about the general information is collected by observation and interview.
- The power consumption of appliances is recorded by taking an average value in some cases.

Data Analysis

Detailed analysis of data collected include calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plans provided by state Electricity Board. Data related to water usages are also analyzed using appropriate methodology.

Recommendation

On the basis of results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of fossil fuels has to be reduced for the sake of community health.

The above target areas particular to the institute was evaluated through questionnaire circulated among the students for data collection. Five categories of questionnaires were distributed.

Onsite Visit

Two-days site visit was conducted by the Experts of Green Audit Team of Eco Paryavaran Laboratories and consultants Pvt. Ltd. on 9th and 10th March 2023. The key focus of the visit was on assessing the status of the green cover of the Institution, their waste management practices and energy conservation strategies etc. The sample collection was carried out during the visits to assess the quality of environment. The samples of air, noise, drinking water and indoor environment were taken from the institute. The sample collection, preservation, and analysis were done in the scientific manner as prescribed by the standard procedures.

Focus Group Discussion

The Focus Group discussions were held with the Club members, staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level.

Energy, waste management and Carbon foot print analysis Survey

With the help of teachers and students, the audit team has assessed the energy consumption pattern and waste generation, disposal and treatment facilities of the institute. The monitoring was conducted with a detailed questionnaire survey method.

Process for Environmental Audit



Process adopted for Environmental Audit



Auditing for Water Resource Management

Auditing for Water Resource Management



Process adopted for Auditing of Water Resource Management

Source of Water

The institute is getting all required water from ground water sources (bore wells – 3 Nos.).

Baseline of Water Consumption

- In India, the design of water supply systems has been done using certain standards. Currently the standard being used is NBC, 2016. This specifies a consideration of use of the following:



- For communities with a population of between 20,000 to 100,000 @ 100 to 135 liters per head per day (Max. 135 lpcd has been considered).
- Persons working in normal working hours i.e. Staff @ 45 liters per head per day
- Visitors in the institute @ 15 liters per head per day

Population in Khalsa College campus

The details of the population (per head counts) in the institute is presented in below Table

Total student & staff population in the Institute

S. No	Particulars	Total Nos.	Residing	Non-residing
1	No. of Students enrolled in Khalsa College	6367	990	5377
2	No. of Staff (teaching & non-teaching) in Khalsa College	831	10	821
Total population in Khalsa College		7198	1000	6198

Total population of daily visitors in the Institute

S. No	Particulars	Total Nos.
1	Daily visitors in Khalsa College (avg.)	100

Thus total maximum permissible water consumption as per Standards laid as per NBC, 2016 is given in below Table.

Total permissible water Consumption as per Standards laid as per NBC, 2016

S. No.	Particulars	Nos.	Water consumption per Person per day (Liters)	Total water consumption Liters per Day
1	No. of students & staff - Non-residing (Day time) Population in Khalsa College	6198	45	2,78,910
2	No. of students & staff - Residing Population in Khalsa College	1000	100	1,00,000
3	Daily visitors in Khalsa College (avg.)	100	15	1,500
Grand Total				3,80,410



An attempt was made as per NBC, 2016 to understand the demand of water supply and waste water generated.

- Actual Water Demand = 4,75,512 liters per day
- Waste Water Generation = 80% of total water consumption = 3,80,410 liters per day

The source of water requirement is ground water (bore wells – 3 Nos.) and the wastewater generation in campus is 3,80,410 liters per day. The institute has no sewage treatment facility; hence the domestic wastewater goes to municipal sewerage. The institute requires sewage treatment facility (STP of 1MLD) based on zero liquid discharge technique for an efficient water resource management. Treated water can be used for plantation and landscaping in the campus.

Rainwater Harvesting

Rainwater harvesting is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to run off. Rainwater can be collected from roofs, and in many places the water collected is redirected to a deep pit (well, shaft, or borehole), a reservoir with percolation. Its uses include water for gardens, livestock, irrigation, domestic use with proper treatment etc. The harvested water can also be used as drinking water, longer-term storage and for other purposes such as groundwater recharge.

Rainwater harvesting provides an independent water supply during regional water restrictions and in developed countries is often used to supplement the main supply. It provides water when there is a drought, can help mitigate flooding of low-lying areas, and reduces demand on wells which may enable groundwater levels to be sustained. It also helps in the availability of potable water as rainwater is substantially free of salinity and other salts. Application of rainwater harvesting in urban water system provides a substantial benefit for both water supply and wastewater subsystems by reducing the need for clean water in water distribution system, less generated storm water in sewer system, as well as a reduction in storm water runoff polluting freshwater bodies. Supplying rainwater that has gone through preliminary filtration measures for non-potable water uses, such as toilet flushing, irrigation, and laundry, may be a significant part of a sustainable water management strategy.

Though the institute is managing seven rainwater harvesting pits in campus to collect rain water from institutional block and hostel buildings. The collected water is being used in ground water recharge and irrigation as a good practice. However, open rain water collection system gets contaminated from surface run off water and it should be a separate and closed type system.



Rain Water Harvesting Systems at Khalsa college

Recommendations

- Domestic wastewater including sewage generation in campus is about 3,80,410 liters per day which goes to municipal sewerage system. The institute requires sewage treatment facility (STP of 1MLD) based on zero liquid discharge technique for an efficient water resource management and to reduce undue pressure on municipal sewerage system.
- The institute has seven rain water harvesting systems to overcome the gap between huge water demand and water conservation. More Rain Water Harvesting Systems to cover remaining Buildings/ Blocks is needed to conserve the water resources.
- Display boards for water conservation and don't misuse water should be adopted.
- Automatic switching system/sensors to be adopted on taps for water use and pump sets used for overhead tank filling.
- Testing of water quality in terms of drinking, sewage and effluent discharge on regular basis with a NABL and MoEF&CC approved laboratory and monitoring of effluent discharges periodically need to be done.



Auditing for Waste Management



Auditing for Waste Management

Pollution from waste is aesthetically displeasing and results in large amounts of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable institute. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examines its waste processing practices.

Quantity of Waste Generated

Solid Waste

Generation of Solid Waste

S. No.	Particulars	Nos.	Rate of solid waste generation (kg/person/day)	Total solid waste generation (kg/day)
1	No. of students & staff - Non-residing (Day time) Population in Khalsa College	6198	0.2	1239.6
2	No. of students & staff - Residing Population in Khalsa College	1000	0.4	400
3	Daily visitors in Khalsa College (avg.)	100	0.2	20
Grand Total				1659.6

The total solid waste generation in Khalsa college is estimated as 1659.6 kg per day.

Management of Solid Wastes

An effective disposal of solid wastes lies on the collection and segregation of wastes in following categories as

(a) Biodegradable wastes

Canteen waste generated in the institute is being handed over to local cattle keepers and pig farmers to feed their animals. Biodegradable waste as plant leaves, biomass and other wastes are collected about 150-200 kg per day. The collected waste is disposed in manure pits for the preparation of organic manures in the range of 50-60 kg per day which is being utilized in garden and plantation and agro farming practices in campus area.



Biodegradable waste management at Khalsa college

(b) Non-biodegradable

The garbage including non-biodegradable items as metals, bottles, plastics, cans and tins, broken glass wares etc. collected from Khalsa College in the range of 50-60 kg per day. Non-biodegradable waste is handed over/ sold to authorized venders with proper accounting for an effective management.



Collection of solid waste at Khalsa college



Management of Hazardous wastes

The institute is operating chemical testing laboratories, health centre, DG sets and other electrical appliances which generates hazardous wastes. The institute is handing over the chemical and hazardous wastes to authorized vendors for proper management and disposal.

Management of E-Waste

Khalsa College has opted “By back purchase policy” to reduce and minimize the e-waste. The new electronic instruments/ equipment, computers and peripherals are purchased by the institute under by back scheme only so that no accumulation of e-waste generates in the campus. However, other broken and outdated electronic items which can’t be replaced are handed over to authorized vendor for proper disposal.

Management of Liquid Wastes

a) Domestic and Sewage

Domestic wastewater including sewage generation in campus is about 3,80,410 liters per day which goes to municipal sewerage system. The institute requires sewage treatment facility (STP of 1MLD) based on zero liquid discharge technique for an efficient water resource management and to reduce undue pressure on municipal sewerage system.

b) Laboratory Effluents

The institute has chemical testing laboratories however the generation of effluent water is less. So the adoption of treatment facility is not feasible, hence the laboratory waste is being handed over to the authorized vendors for the proper disposal of chemicals/hazardous effluents.

Recommendations

- The recycle and reuse practices of waste management with zero discharge should be adopted to manage the natural resources and prevent environmental degradation.
- The laboratory effluents and e-wastes need to be regularly monitored with records and to ensure the hand over to the authorized vendors for the proper disposal to manage the natural resources and prevent environmental degradation.
- Though the institute has sewage management system for domestic wastewater and sewage in the campus, however zero liquid discharge technique can be added for efficient water resource management.



Auditing for Environmental Management

Auditing of Environmental Management

As part of green audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation in the class room. It was observed that illumination and ventilation is adequate considering natural light and fresh air circulations.



Natural ventilation and lighting system at KHALSA COLLAGE

a) Outdoor Environment

Air Quality Index (AQI)

Air Quality Index (AQI) transforms complex air quality data of criteria pollutants into a single number (index value), with nomenclature and colour. AQI was launched on 17th October 2014 in India to disseminate information on air quality in an easily understandable form for the general public. AQI has six categories of air quality which are defined as Good, Satisfactory, Moderately Polluted, Poor, Very Poor and Severe. AQI is considered as 'One Number- One Colour- One Description' for the common man to judge the air quality within his vicinity. The formulation of the index was an initiative under **Swachh Bharat Mission (cleanliness Mission)**, based on the recommendations of IIT Kanpur and the Expert Group formed in this regard. The earlier measuring index in this regard was limited to three indicators, while the current measurement index had been expanded with five additional parameters. The measurement of AQI is based on following pollutants, namely

- Particulate Matter (size less than 10 μm) or (PM₁₀),
- Particulate Matter (size less than 2.5 μm) or (PM_{2.5}),
- Nitrogen Dioxide (NO₂),
- Sulphur Dioxide (SO₂),
- Carbon Monoxide (CO),
- Ozone (O₃) and
- Ammonia (NH₃),

AQI Index values and their associated health impacts

AQI	Associated Health Impacts
Good (0-50)	Minimal Impact
Satisfactory (51-100)	May cause minor breathing discomfort to sensitive people.
Moderately polluted (101-200)	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.
Poor (201-300)	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease
Very Poor (301-400)	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.
Severe (401-500)	May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.

Methodology of AQI

The ambient air quality has been assessed through scientifically designed ambient air quality monitoring network. The monitoring network was designed based on the following considerations:

- Meteorological conditions
- Geographical conditions
- Topography of the area
- Likely impacts and sensitive receptors

Ambient air quality monitoring network was established as per CPCB guidelines in triangular method @120-degree orientation of three sampling locations. Ambient air quality monitoring was done on 24 hourly basis at each identified locations simultaneously.

Parameters & Methods of Air Quality Monitoring

Test methods for determining Various Air Quality Parameters are described in below **Table** as

Test methods for determination of Air Quality Parameters

S. No.	Test Parameter	Test Method
1.	Particulate Matter (PM ₁₀)	IS:5182 (P-23) 2006 RA 2017
2.	Particulate Matter (PM _{2.5})	Lab SOP EL/SOP/AAQ/01
3.	Sulphur Dioxide (SO ₂)	IS:5182 (P-2) 2001 RA 2017
4.	Nitrogen Dioxide (NO ₂)	IS:5182 (P-6) 2006 RA 2017
5.	Ammonia (NH ₃)	Lab SOP EL/SOP/AAQ/02
6.	Ozone (O ₃)	IS:5182 (P-9):2006 RA 2014
7.	Carbon Monoxide (CO)	IS 5182 Part-10:1999, RA 2014

Sampling Procedure

Particulate samples for PM₁₀ were collected on Whatman glass fiber filters using respirable dust sampler (AAS 217NL, Ecotech) whereas samples for PM_{2.5} were collected on Whatman Quartz filter papers (47 mm diameter) using fine particulate sampler (AAS 127Mini, Ecotech). During sampling a laminar flow was maintained as 16.7 liters per min (1.0 m³ per hr) for PM_{2.5} and 1.13 m³ per minute for PM₁₀. The air sampling was done on 24 hourly basis at a nominal sampling height of 3 meter at each location. Gaseous sampling was done using Thermoelectrically cooled Gas sampler (AAS 109TE, Ecotech) whereas CO was collected in tedlar bag for the analysis by NDIR CO Analyzer (APMA-370, Horiba) and Benzene was collected in activated carbon absorber tubes for GC analysis.

Construction of Air Quality Index (AQI)

- Based on the measured ambient air concentrations, corresponding standards and likely health impact (known as health breakpoints), a sub-index is calculated for each of the pollutants.
- A sub-index is a linear function of concentration e.g. the sub-index for PM_{2.5} will be
 - ▣ 51 at concentration 31 µg/m³,
 - ▣ 100 at concentration 60 µg/m³, and
 - ▣ 75 at concentration of 45 µg/m³

The formula for calculating a sub-index is as follows:

Sub Index for a pollutant = Upper limit of the previous AQI category to which the pollutant's current reading would have fallen + [(current reading - upper limit of the previous reading category of the pollutant) * (width or interval of the AQI category for the current level of reading / width or interval of the current reading category of the pollutant)]

Eg. Sub-index for PM_{2.5}

If concentration is 150 µg/m³, the sub index would be = 300+[(150-120)*100/130] = 323

If concentration is 45 µg/m³, the sub index would be = 30+[(45-30)*50/30] = 75

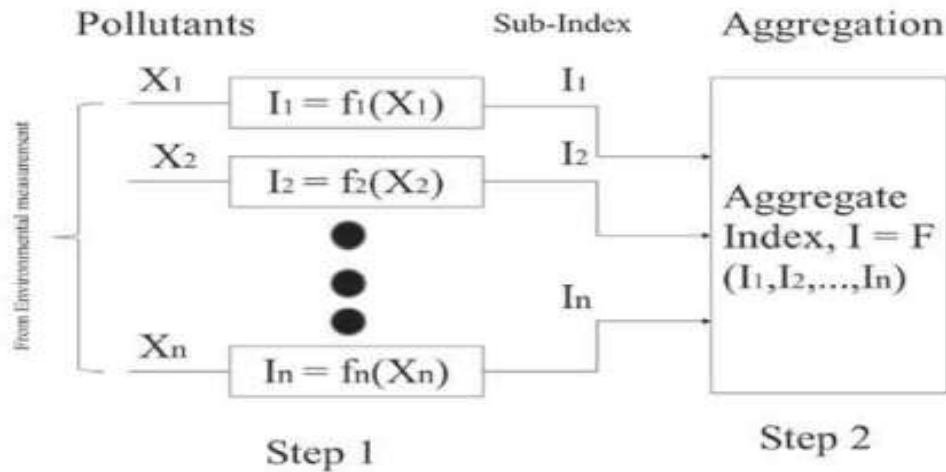


Fig. 7: Index and Sub-index of Pollutants

- Primarily two steps are involved in formulating an AQI: (i) formation of sub-indices (for each pollutant) and (ii) aggregation of sub-indices to get an overall AQI.
- Formation of sub-indices (I₁, I₂, ..., I_n) for n pollutant variables (X₁, X₂, ..., X_n) is carried out using sub-index functions that are based on air quality standards and health effects. Mathematically;

$$I = f(X_i), i=1, 2, \dots, n \quad [\text{Eq. 1}]$$

- Each sub-index represents a relationship between pollutant concentrations and health effect as the functional relationship between sub-index value (I_i) and pollutant concentrations (X_i).
- Aggregation of sub-indices, I_i is carried out with some mathematical function (described below) to obtain the overall index (I), referred to as AQI.



$$I = F(I_1, I_2, \dots, I_n) \quad [\text{Eq. 2}]$$

- The aggregation function usually is a summation or multiplication operation or simply a maximum operator.

Sub-indices (Step 1)

Sub-index function represents the relationship between pollutant concentration X_i and corresponding sub index I_i . It is an attempt to reflect environmental consequences as the concentration of specific pollutant changes. It may take a variety of forms such as linear, non-linear and segmented linear. Typically, the I-X relationship is represented as follows:

$$I = aX + \beta \quad [\text{Eq. 3}]$$

Where, a = slope of the line, β = intercept at $X=0$

The general equation for the sub-index (I_i) for a given pollutant concentration (C_p); as based on 'linear segmented principle' is calculated as:

$$I_i = \left\{ \frac{(I_{HI} - I_{LO})}{(B_{HI} - B_{LO})} \right\} (C_p - B_{LO}) + I_{LO} \quad [\text{Eq. 4}]$$

Where,

B_{HI} = Breakpoint concentration greater or equal to given concentration.

B_{LO} = Breakpoint concentration smaller or equal to given concentration.

I_{HI} = AQI value corresponding to B_{HI}

I_{LO} = AQI value corresponding to B_{LO}

I_p = Pollutant concentration

Aggregation of Sub-indices (Step 2)

Once the sub-indices are formed, they are combined or aggregated in a simple additive form or weighted additive form:

Weighted Additive Form

$$I = \text{Aggregated Index} = \sum W_i I_i \quad (\text{For } i = 1, \dots, n) \quad [\text{Eq. 5}]$$

where,

$$\sum W_i = 1$$

I_i = sub-index for pollutant i



n = number of pollutant variables

Wi = weightage of the pollutant

Root-Sum-Power Form (non-linear aggregation form)

$$I = \text{Aggregated Index} = [\sum I_i^p]^{1/p} \quad [\text{Eq. 6}]$$

where,

p is the positive real number >1

Root-Mean-Square Form

$$I = \text{Aggregated Index} = \{1/k (I_1^2 + I_2^2 + \dots + I_k^2)\}^{0.5} \quad [\text{Eq. 7}]$$

Finally; AQI = Max (Ip) (where; p= 1,2,.....,n; denotes n pollutants)

The AQI values and corresponding ambient concentrations (health breakpoints) for the identified eight pollutants are as follows:

AQI Category, Pollutants and Health Breakpoints

AQI Category (Range)	Categories for various readings of pollutant based on health breakpoints/health impacts						
	PM ₁₀	PM _{2.5}	NO ₂	O ₃	CO	SO ₂	NH ₃
	24-hr	24-hr	24-hr	8-hr	8-hr	24-hr	24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+

***One hourly monitoring (for mathematical calculations only)**

Calculator for Air Quality Index (AQI)



- For manual monitoring stations, an AQI calculator is developed by CPCB wherein data can be fed manually to get AQI value.
- The excel sheet for calculating AQI, as uploaded by CPCB

Interpretation of Air Quality Index (AQI)

- The worst sub-index reflects overall AQI
- For instance, if the sub index of PM_{2.5} =75, SO₂ = 63, NO₂ =38 then the AQI will be 75 which is the same as the value of the sub index of PM_{2.5}.
- The Sub-indices for individual pollutants at a monitoring location are calculated using
 - ✓ 24-hourly average concentration value (8-hourly in case of CO and O₃)
 - ✓ Health breakpoint concentration range (e.g. AQI at 6 am on a day will incorporate data from 6am on previous day to the current day).
 - ✓ AQI is calculated by eight pollutants however, overall AQI can be calculated with available data for minimum three pollutants out of which one should necessarily be either PM_{2.5} or PM₁₀.
 - ✓ Minimum of 16 hours' data is considered necessary for calculating sub index
 - ✓ AQI index values can vary depending on the time of the day.
 - ✓ AQI reflects the status of the worst pollutant in that city. i.e. higher reading in one city can be due to high concentration of PM whereas in some other city it may be due to SO₂.
 - ✓ If one pollutant out of eight is in the “poor” category, then AQI will be in “poor” category.

For manual monitoring stations, data were fed manually in AQI calculator developed by CPCB to get AQI value. The AQI calculation has been depicted as

Air Quality Index (AQI) Calculator

Air Quality Index (AQI) Calculator					
Date	DD-MM-YYYY	INPUT	Station	NSIT	
Pollutants	Duration	Conc. in µg/m³ (CO in mg/m³)	Sub-Index	Check	AQI



PM ₁₀	24-hr avg	89	92	1	89
PM _{2.5}	24-hr avg	52	93	1	
SO ₂	24-hr avg	10	13	1	
NO ₂	24-hr avg	21	26	1	
CO	max 8-hr	0.11	6	1	
O ₃	max 8-hr	19	19	1	
NH ₃	24-hr avg	22	7	1	
Concentrations of minimum three pollutants are required; one of them should be PM ₁₀ or PM _{2.5} . The check displays "1" when a non-zero value is entered					

Interpretation of Air Quality Index (AQI)

Air Quality Index

Indicators & Categories of Air Quality Index

Good (0-50)
Satisfactory (51-100)
Moderately polluted (101-200)
Poor (201-300)
Very Poor (301-400)
Severe (401-500)

AQI Result

Test Results of Air Quality Index

Air Quality Index	Air Quality Status
89	Satisfactory (51-100)

The Air Quality Index (AQI) is observed as 81 that indicates the ambient air quality is Satisfactory at institute and safe for human health.

b) Indoor Environment

Indoor environment was monitored for visual comfort, thermal comfort, ventilation and noise levels in each institute blocks.

Visual and Thermal Comfort

Visual comfort was monitored using Lux monitor and thermal comfort was monitored by Heat stress analyzer for temperature and humidity levels.



Photographic view of visual comfort and Lux Level Monitoring

Particulate dust and Noise Levels



Photographic view of Indoor Dust & Noise Level Monitoring

Indoor environment in respect to visual comfort, thermal comfort, noise levels and ventilation was found to be satisfactory in each block of the institute.



Auditing for Health and Safety

Auditing for Health and Safety

a) Fire Safety



Fire Safety Measures at Khalsa Collage

Fire safety appliances are in place in each department /Section in compliance to fire safety norms.

b) Health Safety

Health safety measures were reported in place as per requirements in respect to safe and potable drinking water supply with RO systems. Drinking water sample was tested for the purpose of potability and suitability of water quality. The available water quality was found to be safe for domestic and human consumption. Health community center/dispensary is operational in campus for primary health checkups and treatments in case of any medical emergency or medical requirements.

c) Traffic & Parking Area

The campus has designated parking area in place that is sufficient to manage daily traffic fleet in the campus due. Good traffic management practices reduce the accidental risks to students, staff and visitors coming to the campus.



Auditing for Green Campus Management

Auditing for Green Campus Management

Unfortunately, the biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress. The institute is nestled amidst tall trees and lush green plants as

- Trees (72 species),
- Herbs (12 species),
- Shrubs (14 species),
- Medicinal Plants (14 species),
- Ornamental Plants (37 species),
- Hydrophytes (8 species),
- Palm (8 species) and
- Nursery Plants (98 species)



Tree Plantation at Khalsa Collage, Amritsar



Nursery Plantation at Khalsa Collage, Amritsar



Horticulture at Khalsa Collage, Amritsar



List of Trees in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Acacia auriculiformis</i>	Vilayati Kikar	Leguminaceae	Tree
2.	<i>Acacia nilotica</i>	Kikar	Leguminaceae	Tree
3.	<i>Acalypha indica</i>	Copper Leaf	Euphorbiaceae	Tree
4.	<i>Achras sapota</i>	Chikoo	Sapotaceae	Tree
5.	<i>Aegle marmelos</i>	Bael	Rutaceae	Tree
6.	<i>Albizia lebbek</i>	Siris	Leguminaceae	Tree
7.	<i>Alstonia scholaris</i>	Devil's Tree	Apocynaceae	Tree
8.	<i>Annona squamosa</i>	Sitaphal	Annonaceae	Tree
9.	<i>Araucaria cooki</i>	Captain's Cook Pine	Araucariaceae	Tree
10.	<i>Artocarpus heterophylla</i>	Kathal	Moraceae	Tree
11.	<i>Averrhoa carambola</i>	Star fruit	Oxalidaceae	Tree
12.	<i>Azadirachta indica</i>	Neem	Meliaceae	Tree
13.	<i>Bambusa vulgaris</i>	Bamboo	Poaceae	Tree
14.	<i>Bauhinia variegata</i>	Kachnaar	Leguminaceae	Tree
15.	<i>Bombax ceiba</i>	Semal	Malvaceae	Tree
16.	<i>Callistemon lanceolatus</i>	Bottle brush	Myrtaceae	Tree
17.	<i>Carica papaya</i>	Papaya	Caricaceae	Tree
18.	<i>Cassia fistula</i>	Amaltas	Leguminaceae	Tree
19.	<i>Cedrella toona</i>	Toon	Mimosaceae	Tree
20.	<i>Cinnamomum tamala</i>	Tej Pata	Lauraceae	Tree
21.	<i>Citrus aurantifolia</i>	Kagazi Nimbu	Rutaceae	Tree
22.	<i>Citrus limon</i>	Nimbu	Rutaceae	Tree
23.	<i>Citrus maxima</i>	Pomelo	Rutaceae	Tree
24.	<i>Citrus reticulata</i>	Mandarin Orange	Rutaceae	Tree
25.	<i>Citrus sinensis</i>	Sweet orange	Rutaceae	Tree
26.	<i>Dalbergia sisso</i>	Shisham	Leguminaceae	Tree
27.	<i>Delonix regia</i>	Gulmohar	Leguminaceae	Tree
28.	<i>Diospyros melonxylon</i>	East Indian Ebony	Ebenaceae	Tree
29.	<i>Draceana braunii</i>	Lucky bamboo	Asparagaceae	Tree
30.	<i>Draceana sanderiana</i>	Lucky bamboo	Asparagaceae	Tree
31.	<i>Eucalyptus ochrophloia</i>	Safeda	Myrtaceae	Tree
32.	<i>Ficus begalensis</i>	Bohr	Moraceae	Tree



33.	<i>Ficus benjamina</i>	Weeping Fig	Moraceae	Tree
34.	<i>Ficus deltoidea</i>	Rubber plant	Moraceae	Tree
35.	<i>Ficus glomerata</i>	Indian fig tree	Moraceae	Tree
36.	<i>Ficus integrifolia</i>	Weeping Fig	Moraceae	Tree
37.	<i>Ginkgo biloba</i>	Maidenhair Tree	Ginkgoaceae	Tree
38.	<i>Grevillea robusta</i>	Silver oak	Proteaceae	Tree
39.	<i>Jacaranda mimosifolia</i>	Fern tree	Bignoniaceae	Tree
40.	<i>Kigelia pinnata</i>	Suasage Tree	Bignoniaceae	Tree
41.	<i>Litchi chinensis</i>	Litchi	Sapindaceae	Tree
42.	<i>Madhuca longifolia</i>	Mahua	Sapotaceae	Tree
43.	<i>Magnolia grandiflora</i>	Champa	Magnoliaceae	Tree
44.	<i>Mangifera indica</i>	Mango	Anacardiaceae	Tree
45.	<i>Morus alba</i>	Shahtoot	Moraceae	Tree
46.	<i>Murraya paniculata</i>	Kamini	Rutaceae	Tree
47.	<i>Musa paradisiaca</i>	Banana	Musaceae	Tree
48.	<i>Pandanus utilis</i>	Screw pine	Pandanaceae	Tree
49.	<i>Phyllanthus emblica</i>	Amla	Phyllanthaceae	Tree
50.	<i>Pinus roxburghii</i>	chir pine	Pinaceae	Tree
51.	<i>Plumeria alba</i>	Farangipani/ Champa	Apocynaceae	Tree
52.	<i>Plumeria obtusa</i>	Champa	Apocynaceae	Tree
53.	<i>Polyalthia longifolia</i>	Ashok tree	Annonaceae	Tree
54.	<i>Pongamia pinnata</i>	Sukhchain	Fabaceae	Tree
55.	<i>Prosopis juliflora</i>	Jhandh	Fabaceae	Tree
56.	<i>Prunus amygdalus</i>	Badaam	Rosaceae	Tree
57.	<i>Prunus domestica</i>	European plum	Rosaceae	Tree
58.	<i>Prunus dulcis</i>	Khar badaam	Rosaceae	Tree
59.	<i>Prunus indica</i>	plums	Rosaceae	Tree
60.	<i>Prunus malus</i>	Plum leaf crab apple	Rosaceae	Tree
61.	<i>Prunus persica</i>	Aroo	Rosaceae	Tree
62.	<i>Psidium cattleianum</i>	kaala amrood	Myrtaceae	Tree
63.	<i>Psidium guajava</i>	Guava	Myrtaceae	Tree
64.	<i>Pterospermum acerifolium</i>	Kanak champa	Sterculiaceae	Tree
65.	<i>Senna auriculata</i>	Matura tea tree	Caesalpinaceae	Tree
66.	<i>Sterculia foetida</i>	bastard poon tree	Sterculiaceae	Tree



67.	<i>Tamarindus indica</i>	Imli	Leguminaceae	Tree
68.	<i>Tectona grandis</i>	Teak	Lamiaceae	Tree
69.	<i>Terminalia arjuna</i>	Arjun	Combretaceae	Tree
70.	<i>Yucca aloifolia</i>	Dagger plant	Asparagaceae	Tree
71.	<i>Yucca gloriosa</i>	Palm lily	Asparagaceae	Tree
72.	<i>Zizyphus jujube</i>	Ber	Rhamnaceae	Tree

List of Herbs in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Aloe barbadensis</i>	Kawaar gandal	Asphodelaceae	Herb
2.	<i>Cestrum nocturnum</i>	Raat ki rani	Solanaceae	Herb
3.	<i>Cyperus alternifolius</i>	Umbrella Palm	Cyperaceae	Herb
4.	<i>Hymenocallis caribaea</i>	Caribbean spider lily	Amaryllidaceae	Herb
5.	<i>Impatiens balsamina</i>	Balsam	Balsaminaceae	Herb
6.	<i>Lavandula angustifolia</i>	Lavender	Lamiaceae	Herb
7.	<i>Malva sylvestris</i>	Common mallow	Malvaceae	Herb
8.	<i>Ocimum sanctum</i>	Tulsi	Lamiaceae	Herb
9.	<i>Phragmites karka</i>	Reed grass	Poaceae	Herb (Woody)
10.	<i>Pteris vittata</i>	Chinese brake fan	Pteridaceae	Herb
11.	<i>Saussurea obvallata</i>	Brahma Kamal	Asteraceae	Herb
12.	<i>Tagetes erecta</i>	Marigold	Asteraceae	Herb

List of Shrubs in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Bougainvillea glabra</i>	Bougainvillea	Nyctanthaceae	Shrub
2.	<i>Camellia sinensis</i>	Tea	Theaceae	Shrub
3.	<i>Gardenia taitensis</i>	Star of Tahiti	Rubiaceae	Shrub
4.	<i>Grewia asiatica</i>	Phalsa	Malvaceae	Shrub
5.	<i>Ixora coccinia</i>	scarlet jungle flame	Rubiaceae	Shrub
6.	<i>Jasminum auriculatum</i>	Indian Jasmine	Oleaceae	Shrub
7.	<i>Jasminum multiflorum</i>	Star Jasmine	Oleaceae	Shrub
8.	<i>Jasminum officinale</i>	Jasmine	Oleaceae	Shrub
9.	<i>Juniperus cedrus</i>	Juniper	Cupressaceae	Shrub
10.	<i>Punica granatum</i>	Anaar	Punicaceae	Shrub



11.	<i>Pyrus communis</i>	Common pear	Rosaceae	Shrub
12.	<i>Ruscus aculeatus</i>	witches broom	Asparagaceae	Shrub
13.	<i>Tabernaemontana divaricata</i>	Chandni	Apocynaceae	Shrub
14.	<i>Zamia furfuracea</i>	Cardboard Palm	Zamiaceae	Shrub

List of Medicinal Plants in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Amomum subulatum</i>	Badi Elaichi	Zingiberaceae	Medicinal
2.	<i>Asparagus officinalis</i>	Shatawari	Asparagaceae	Medicinal
3.	<i>Brassica campestris</i>	Mustard	Brassicaceae	Medicinal
4.	<i>Calatropis procera</i>	Desi aak	Apocynaceae	Medicinal
5.	<i>Curcuma longa</i>	Turmeric	Zingiberaceae	Medicinal
6.	<i>Elletaria cordamomum</i>	Chotti Elaichi	Zingiberaceae	Medicinal
7.	<i>Ferula asafoetida</i>	Heeng	Apiaceae	Medicinal
8.	<i>Lawsonia inermis</i>	Heena	Lythraceae	Medicinal
9.	<i>Murraya koenigii</i>	kadi patta	Rutaceae	Medicinal
10.	<i>Piper nigrum</i>	kaali mirch	Piperaceae	Medicinal
11.	<i>Syngonium podophyllum</i>	Arrowhead Vine	Araceae	Medicinal Plant
12.	<i>Syzygium aromaticum</i>	Clove	Myrtaceae	Medicinal Plant
13.	<i>Syzygium cuminii</i>	indian Black berry	Myrtaceae	Medicinal Plant
14.	<i>Tinospora cordifolia</i>	Giloy	Apocynaceae	Medicinal

List of Ornamental Plants in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Aglaonema commutatum</i>	Philippine evergreen	Araceae	Ornamental
2.	<i>Alcea rosea</i>	Hollyhock	Malvaceae	Ornamental
3.	<i>Alocasia adora</i>	Taro	Araceae	Ornamental
4.	<i>Antigonon leptopus</i>	Coral Vine	Polygonaceae	Ornamental
5.	<i>Aristolochia elegans</i>	Dutchman's Pipe	Aristolochiaceae	Ornamental
6.	<i>Arundo donax</i>	Reed Grass	Poaceae	Ornamental
7.	<i>Biota orientalis</i>	Tree of life	Cupressaceae	Ornamental
8.	<i>Bryophyllum pinnatum</i>	Pathar Chat	Crassulaceae	Ornamental
9.	<i>Clematis montana</i>	Mountain clematis	Ranunculaceae	Ornamental



10.	<i>Clerodendrum trichotomum</i>	Glory Flower	Verbenaceae	Ornamental
11.	<i>Colocasia esculenta</i>	Green Taro	Araceae	Ornamental
12.	<i>Combretum indicum</i>	Rangoon creeper	Combretaceae	Ornamental
13.	<i>Cordia bioassieri</i>	Ginger tree	Euphorbiaceae	Ornamental
14.	<i>Cordia variegatum</i>	Garden croton	Euphorbiaceae	Ornamental
15.	<i>Crinum asiaticum</i>	Spider plant	Amaryllidaceae	Ornamental
16.	<i>Croton californicus</i>	California croton	Euphorbiaceae	Ornamental
17.	<i>Cupressus sempervirens</i>	Italian Cypress	Cupressaceae	Ornamental
18.	<i>Euphorbia commutata</i>	Dana thor	Euphorbiaceae	Ornamental
19.	<i>Euphorbia pulcherrima</i>	Poinsettia	Euphorbiaceae	Ornamental
20.	<i>Euphorbia tiruculli</i>	Pencil tree	Euphorbiaceae	Ornamental
21.	<i>Helianthus annuus</i>	Sunflower	Asteraceae	Ornamental
22.	<i>Hibiscus rosa-sinensis</i>	China rose	Malvaceae	Ornamental
23.	<i>Lagerstroemia indica</i>	Crepe Myrtle	Lythraceae	Ornamental
24.	<i>Lantana camara</i>	Panj phuli	Verbenaceae	Ornamental
25.	<i>Ledebouria socialis</i>	Wood Hyacinth	Asparagaceae	Ornamental
26.	<i>Monstera adansonii</i>	Swiss cheese plant	Araceae	Ornamental
27.	<i>Opuntia ficus-indica</i>	Chittar thor	Cactaceae	Ornamental
28.	<i>Papaver orientale</i>	Oriental poppy	Papavaraceae	Ornamental
29.	<i>Petunia hybrida</i>	Garden Petunia	Solanaceae	Ornamental
30.	<i>Petunia integrifolia</i>	Violet flower	Solanaceae	Ornamental
31.	<i>Smilax aspera</i>	Rough bindweed	Smilacaceae	Ornamental
32.	<i>Spiraea corymbosa</i>	shiny leaf meadow sweet	Rosaceae	Ornamental
33.	<i>Tecoma fulva</i>	Cahuato	Bignoniaceae	Ornamental
34.	<i>Thevetia peruviana</i>	Peeli kaner	Apocynaceae	Ornamental
35.	<i>Vinca rosea</i>	Rose periwinkle	Apocynaceae	ornamental
36.	<i>Vitis vinifera</i>	Grape vine	Vitaceae	ornamental
37.	<i>Wisteria sinensis</i>	Chinese Wisteria	Fabaceae	Ornamental

List of Hydrophytes in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Azolla pinnata</i>	Azolla	Azollaceae	Hydrophytes



2.	<i>Ceratophyllum submersum</i>	Coon's tail	Ceratophyllaceae	Hydrophytes
3.	<i>Eichhornia crassipes</i>	Water hyacinth	Pontederiaceae	Hydrophytes
4.	<i>Hydrilla verticillata</i>	Water thyme	Hydrocharitaceae	Hydrophytes
5.	<i>Marsilea quadrifolia</i>	Water clover	Marsileaceae	Hydrophytes
6.	<i>Nelumbo nucifera</i>	Lotus	Nelumbonaceae	Hydrophytes
7.	<i>Typha latifolia</i>	Cat tail	Typhaceae	Hydrophytes

List of Palm in Khalsa Collage campus

S. No.	Plants	Common Names	Family	Habit
1.	<i>Calamus rotang</i>	Rattan	Arecaceae	Palm
2.	<i>Caryota urens</i>	Fish palm	Arecaceae	Palm
3.	<i>Cycas circinalis</i>	Queen sago	Cycadaceae	Palm
4.	<i>Cycas revoluta</i>	Sago palm	Cycadaceae	Palm
5.	<i>Dyopsis lutescens</i>	Golden cane bamboo	Arecaceae	Palm
6.	<i>Livistona chinensis</i>	China Palm	Arecaceae	Palm
7.	<i>Phoenix dactylifera</i>	Date palm	Arecaceae	Palm
8.	<i>Roystonea regia</i>	Royal Palm	Arecaceae	Palm

List of Plant Species of KCA in Khalsa Collage campus

Sr. No.	Botanical name of plant	Common Name
1	<i>Aegle marmelos</i>	Bael
2	<i>Albizia lebbek</i>	Siris
3	<i>Albizia procera</i>	White siris
4	<i>Alstonia scholaris</i>	Devil's Tree
5	<i>Anthocephalous cadamba</i>	Kadam
6	<i>Azadirachta indica</i>	Neem
7	<i>Bauhinia variegata</i>	Kachnaar
8	<i>Bombax ceiba</i>	Silk cotton tree
9	<i>Bombax malabaricum</i>	Semal
10	<i>Butea monosperma</i>	Flame of the forest
11	<i>Callistemon citrinus</i>	Bottle Brush
12	<i>Caryota urens</i>	Fishtail Palm



13	<i>Cassia fistula</i>	Amaltas
14	<i>Cassia siamea</i>	Siamese cassia
15	<i>Cedrella toona</i>	Tun
16	<i>Chukrasia tabularis</i>	Chakrasia
17	<i>Crateva religiosa</i>	Baran
18	<i>Dalbergia sissoo</i>	Sheesham
19	<i>Delonix regia</i>	Gulmohar
20	<i>Dypsis lutescens</i>	Golden Palm
21	<i>Eucalyptus globulus</i>	Safeda
22	<i>Eucalyptus ochrophloia</i>	Safeda
23	<i>Ficus bengalensis</i>	Bohar
24	<i>Ficus benjamina</i>	Weeping fig
25	<i>Ficus infectoria</i>	White fig
26	<i>Ficus racemosa</i>	Gular
27	<i>Ficus religiosa</i>	Peepal
28	<i>Grevillea robusta</i>	Silver Oak
29	<i>Jacaranda mimosifolia</i>	Jakranda
30	<i>Livistona chinensis</i>	China Palm
31	<i>Mangifera indica</i>	Mango
32	<i>Melia azedarach</i>	Dhrek
33	<i>Moringa oleifera</i>	Drum Stick
34	<i>Morus alba</i>	Toot
35	<i>Murraya paniculata</i>	Kamini
36	<i>Phoenix dactylifera</i>	Date palm
37	<i>Phyllanthus emblica</i>	Amla
38	<i>Plumeria alba</i>	Champa
39	<i>Polyalthia longifolia</i>	Ashoka
40	<i>Pongamia pinnata</i>	Sukhchain
41	<i>Pterospermum acerifolium</i>	Kanak champa
42	<i>Putranjiva roxburghii</i>	Putranjiva
43	<i>Roystonea regia</i>	Royal palm
44	<i>Schleichera oleosa</i>	Kusum
45	<i>Syzygium cumini</i>	Jamun
46	<i>Tectona grandis</i>	Teak



47	<i>Terminalia arjuna</i>	Arjan
48	<i>Terminalia mantaly</i>	Terminalia
49	<i>Thevetia peruviana</i>	Peeli Kaner

List of Nursery Plants in Khalsa Collage campus

S. No.	Common Name	Botanical Name	Number
1.	Kinnow	<i>Citrus nobilis</i> × <i>Citrus deliciosa</i>	50
2.	Daisy	Fortune mandarin × Fremont mandarin	55
3.	Sweet lime	<i>Citrus limetta</i>	60
4.	Sweet Orange	<i>Citrus sinensis</i>	45
5.	Baramasi lemon	<i>Citrus limon</i>	25
6.	Kagzi lime	<i>Citrus aurantifolia</i> Swingle	20
7.	Chakotra	<i>Citrus maxima</i>	15
8.	Galgal	<i>Citrus pseudolimon</i>	20
9.	Pear	<i>Pryus pyrifolia</i>	600
10.	Peach	<i>Prunus persica</i>	210
11.	Plum	<i>Punus domestica</i>	320
12.	Guava	<i>Psidium gujava</i>	780
13.	Grapes	<i>Vitis vinifera</i>	220
14.	Pomegranate	<i>Punica granatum</i>	190
15.	Fig	<i>Ficus carica</i>	110
16.	Mango (Desi)	<i>Mangifera indica</i>	415
17.	Aonla (Desi)	<i>Emblica officinalis</i>	55
18.	Apple	<i>Malus</i> × <i>domestica</i>	60
19.	Karonda	<i>Carissa carandas</i>	45
20.	Rough lemon (Jatti Khatti)	<i>Citrus jambheri</i>	2000
21.	Jamun	<i>Syzygium cumini</i>	500
22.	Phalsa	<i>Grewia asiatica</i>	210
23.	Banana	<i>Musa spp.</i>	100
24.	Palm	<i>Archontophoenix alexandrae</i>	200
25.	Areca palm	<i>Dypsis lutescens</i>	20
26.	Bougainvillea	<i>Bougainvillea spp.</i>	25
27.	Jhumka	<i>Quisqualis indica</i>	55
28.	Morpankh	<i>Thuja orientalis</i>	500



29.	Juniperus	<i>Juniperus communis</i>	450
30.	Coleus	<i>Coleus scutellarioides</i>	190
31.	Spider plant	<i>Chlorophytum comosum</i>	200
32.	Saplera plant	<i>Schefflera arboricola</i>	40
33.	Croton banglori	<i>Codiaeum variegatum</i>	50
34.	Croton	<i>Codiaeum variegatum</i>	100
35.	Dracaena	<i>Dracaena fragrans</i>	110
36.	Lily flower	<i>Lilium longiflorum</i>	300
37.	Lily plant	<i>Lilium longiflorum</i>	100
38.	Sachet	<i>Lebronnecia kokioides</i>	200
39.	Jasmine single	<i>Jasminum sambac</i>	190
40.	Jasmine double	<i>Jasminum sambac</i>	100
41.	Gulachin	<i>Plumeria rubra</i>	100
42.	Lantana	<i>Lantana camara</i>	55
43.	Saru	<i>Casuarina equisetifolia</i>	20
44.	Song of India	<i>Dracaena reflexa</i>	50
45.	Snake plant	<i>Dracaena trifasciata</i>	20
46.	Neelkanth plant	<i>Clitoria ternatea</i>	600
47.	Alocasia	<i>Alocasia macrorrhizos</i>	200
48.	Pothos	<i>Epipremnum aureum</i>	210
49.	Fern	<i>Tracheophyta</i>	200
50.	Tuberose	<i>Polianthes tuberosa</i>	110
51.	Rangoon Creeper	<i>Combretum indicum</i>	50
52.	Stapf (Lemon grass)	<i>Cymbopogon citratus</i>	10
53.	Gulachin	<i>Plumeria rubra</i>	90
54.	Hamelia	<i>Hamelia patens</i>	110
55.	Elachi	<i>Elettaria cardamomum</i>	50
56.	Zed plant	<i>Crassula ovata</i>	210
57.	Ruscus	<i>Ruscus aculeatus</i>	100
58.	Nagdon plant	<i>Euphorbia Tithymaloides</i>	10
59.	Chrysanthemum	<i>Chrysanthemum indicum</i>	2500
60.	Silver plant	<i>Centaurea cineraria</i>	110
61.	Raat di Rani	<i>Cestrum nocturnum</i>	45
62.	Aloe Vera	<i>Aloe barbadensis</i>	100



63.	Asparagus	<i>Asparagus officinalis</i>	50
64.	Ficus	<i>Ficus benjamina</i>	150
65.	Tecoma	<i>Tecoma stans</i>	220
66.	Mehndi (Heena tree)	<i>Lawsonia inermis</i>	20
67.	Lagerstroemia	<i>Lagerstroemia indica</i>	50
68.	Hibiscus	<i>Hibiscus rosa-sinensis</i>	200
69.	Rose	<i>Rosa indica</i>	600
70.	Chandni	<i>Tabernaemontana divaricate</i>	300
71.	Lajwanti	<i>Mimosa pudica</i>	20
72.	Acalypha	<i>Acalypha indica</i>	15
73.	Casuarina	<i>Casuarina spp.</i>	10
74.	Kaner	<i>Cascabela thevetia</i>	50
75.	Poinsettia	<i>Euphorbia pulcherrima</i>	60
76.	Duranta	<i>Duranta erecta</i>	120
77.	Clerodendrum	<i>Clerodendrum infortunatum</i>	115
78.	Succulents		20
79.	Madhumalti	<i>Combretum indicum</i>	20
80.	Cactus		200
81.	Bryophyllum	<i>Kalanchoe pinnata</i>	300
82.	Silver Yucca	<i>Yucca luminosa</i>	130
83.	Yucca glauca	<i>Yucca glauca</i>	20
84.	Euphorbia	<i>Euphorbia paralias</i>	20
85.	Neem	<i>Azadirachta indica</i>	200
86.	Dek	<i>Melia azedarach</i>	100
87.	Sukhchain	<i>Pongamia pinnata</i>	100
88.	Silver oak	<i>Grevillea robusta</i>	20
89.	Putranjiva	<i>Putranjiva roxburghii</i>	110
90.	Mulberry	<i>Morus rubra</i>	200
91.	Amaltas	<i>Cassia fistula</i>	150
92.	Indian Banyan (Bohar)	<i>Ficus benghalensis</i>	100
93.	Moringa	<i>Moringa oleifera</i>	100
94.	Poplar	<i>Populus alba</i>	500
95.	Monsari	<i>Mimusops elengi</i>	50
96.	Pilkhan	<i>Ficus virens</i>	10



97.	Bel Patra	<i>Aegle marmelos</i>	210
98.	Kadi Pata	<i>Murraya koenigii</i>	200

Green belt with sufficient tree cover is managed by the campus. Following short comings were observed for the effectiveness of plantation management drive in the campus as

- Plant counting and numbering record is being managed for the effective plant management program at campus.

House Keeping

Being the part of Swatchha Bharat Abhiyan, the Khalsa College Amritsar ensures neat and clean environment. Consequently, buildings are kept clean and sanitized on regular basis on all working days.

Recommendations

- All trees in the campus should be with track record
- Automatic drip irrigation system has been installed in high-tech poly house and the same system can be adopted for plantation/ irrigational and other areas for effective water resource management.
- Encouraging students and conducting competitions among departments for making the campus green.



Auditing for Carbon Footprint

Auditing for Carbon Footprint

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol and diesel vehicles). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Among the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your 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. One aspect is to consider the distance and method traveled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examines its carbon footprint.

The institute is operating common transportation facility for students and staff as buses for outdoor transport and E-Rickshaws for in door transport. Mostly students & staff is encouraged to use public transport.



E-Rickshaws in Khalsa College, Amritsar



Reducing the Carbon Footprints

- Installation of solar panels or solar energy generation devices should be enhanced to reduce the electricity footprint of the campus. Terrace of each building can be utilized to produce electricity from tilt-able solar modules.
- The food waste generated from the institute hostel mess, guest house, canteens and staff quarters should be converted into the biogas which can be further utilized for hostel kitchens.
- Adoption of E-vehicle for common transportation facility and solar battery operated vehicles in campus to reduce carbon footprints and save environment.
- The Green computing or E-work is helping the organization to reduce footprint very effectively.
- The use of solar energy based lamps in streets and corridors in campus will reduce carbon footprint.
- The awareness should be made among the faculty, students and other employees regarding Clean Development Mechanism (CDM) to reduce the consumption of electricity and natural resources.
- Establish a system of carpooling among the staff to reduce the number of four wheelers coming to the institute.
- Encourage students and staff to use cycles and follow No Vehicle Day on one day in a week to save fuel consumption.
- Effective biodegradable waste management and efficient cooking system to save gas are in place and the institute has been awarded ***Eat Right Campus Certification by the State Govt. of Punjab.***
- As an outcome effort can be made to reduce carbon foot prints by using electrical vehicles in the campus and green computing in the administration and examination.



Evaluation of Audit Findings



Evaluation of Audit Findings

- ✚ Management of domestic waste water with zero liquid discharge technology is recommended to manage water resources and to prevent environmental degradation.
- ✚ Management of solid wastes by authorized vendors is found satisfactory.
- ✚ Management of Hazardous wastes as laboratory effluents need to be established.
- ✚ Management of biodegradable wastes by converting into manures using composting/manure pits is appreciable.
- ✚ More rain water harvesting systems/ recharge pits need to be established covering all buildings with separate and dedicated drainage system to avoid surface runoff contaminations.
- ✚ Efforts of energy conservation by adopting solar panels as water heater and street lights are appreciable.
- ✚ Gardens with sufficient green belt in Khalsa College premises are found well maintained.
- ✚ Green policy/Environmental policy statement indicating the commitment of the institute towards its environmental performance should be followed.
- ✚ Notice boards and signs to reduce over exploitation of water and other natural resources have been displayed in the campus to sensitize the students for environment.
- ✚ Environmental education programs have to be strengthened.
- ✚ Establish a purchase policy for environmental friendly materials
- ✚ Bio degradable waste may be used for non-conventional energy generation or steam generation for cooking food/washing cloths etc.
- ✚ Bio gas plant should be installed to manage biodegradable wastes
- ✚ Strengthen the environmental awareness programs with huge plantation and environment friendly techniques to protect the environment and natural resources.
- ✚ Initiative for carbon accounting such as adequate common transportation facilities for all students and staff should be provided by the institute.
- ✚ Encourage students to use bicycles.
- ✚ A model solid waste management system based on 3R's (reduce, reuse and recycle) to be established to reduce undue pressure on municipal system and to convert solid wastes into valuable resources.
- ✚ No plastic waste has been observed in campus as a good practice for **No use of plastic**.



Key Recommendations

Key Recommendations

Following are some of the key recommendations for improving campus environment:

- ❖ A model solid waste management system based on 3R's (reduce, reuse and recycle) to be established to reduce undue pressure on municipal system and to convert solid wastes into valuable resources.
- ❖ Regular monitoring of waste generation and disposal practices to prevent environmental degradation and the information should be made available to administration regularly.
- ❖ Management of domestic waste water with zero liquid discharge technology is recommended to manage water resources and to prevent environmental degradation.
- ❖ Management of Hazardous wastes as laboratory effluents need to be established.
- ❖ Adoption of more rain water harvesting system needs to be installed on remaining Building/ Blocks and automatic drip irrigation system to conserve the valuable water resources.
- ❖ An environmental policy with the goal and objectives of clean and green environment, zero waste generation and adoption of green energy needs to be established.
- ❖ Science laboratories large amount of water goes waste during the process of making distilled water; the system should have developed to reuse this water for other purposes. The solar distillation unit should be adopted.
- ❖ Adoption of sufficient e-vehicle for common transportation facility and solar battery operated vehicles in campus to reduce carbon footprints and save environment.
- ❖ Adoption of more solar energy options to reduce the stress on natural resources, to prevent environmental degradation and economic viability.



Basic and Fundamental Components of environmental sustainability



Preparation of Action Plan

Preparation of Action Plan

There should be Committee formation for energy audit, green audit and environmental audit involving faculties and students. Policies referring to management and approach towards the use of resources need to be considered. The institute should have a green policy and environmental policy for its sustainable development. The environmental policy formulated by the management should be implemented meticulously. The institute should have a policy on awareness raising or training programs (for ground staff or kitchen staff for example) and an environment friendly procurement policy (the Institute's policy for purchasing ecofriendly materials). Green Audits are exercises which generate considerable quantities of valuable management information. The time, effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organization and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of organizational priorities and the passing of time.

Exit Meeting

The exit meeting was conducted jointly by the experts of Eco Paryavaran Laboratories and Consultants Pvt. Ltd. and the team members of the institute. It was a mechanism to provide the management and staff a broad feedback on the preliminary findings of the audit team before completing the audited report. The exit meeting was held in the campus of institute on 10th March 2023. Clarification on certain information gathered was sought by the audit team from the management and staff of the institute.



Team of Experts involved in Green Audit



Draft Audit Report

The information gathered by the audit team was consolidated as a draft audit report. This draft report was then circulated to the audit team and those directly concerned with the audit to check the report for accuracy. The draft green audit report was also discussed in the exit meeting.

Final Audit Report

The final audit report is the corrected final document which contains the findings and recommendations of the audit. It will also form one of the basis of future audits because the information it contains informs some of the tests and analyses that need to be performed in the future. Final Audit Report was submitted to the Principal / Director of the institute.

Follow Up and Action Plans

Green audits form a part of an on-going process. Innovative green initiatives have to be designed and implemented every year to make the institute environmentally sustainable. Follow up programs of green auditing recommendations should be done meticulously before next audit.

Next Audit

In order to promote continuous improvement, it is recommended to conduct the next green auditing during the year 2025.

Transparency of Green Audit Report

Green audit report is one of the useful means of demonstrating an organization's commitment to openness and transparency. If an organization believes it has nothing to hide from its stakeholders, then it should feel confident enough to make its green audit reports freely available to those who request them. As a basic rule, green audit reports should be made available to all stakeholders.



About Eco Group (Consultant)



ABOUT ECO GROUP


Eco Group is North India's reputed environmental organization Headquartered in Mohali (Chandigarh) that offers consultancy and environmental-related turnkey solutions for overall pollution abatement and sustainable development. We are a professional engineering firm with National level consultancy approved by QCI/ NABET and Environmental and Mechanical testing laboratory approved by MoEF&CC, NABL (ISO/IEC 17025:2017) and state boards.

Eco Group, established in 1998 has designed, engineered and executed more than 1,000 installations of Water, Domestic Sewage and Industrial Effluent Treatment Plants. With the help of our state-of-the-art technologies and apt infrastructure, we are proud to maintain an impeccable quality record, owing to our customer satisfaction levels. These treatment plants operate with the help of trained staff, including Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs), Reverse Osmosis Plants (ROs), etc. In the last 20 years, we have undertaken several projects successfully and have created sustainable solutions to environmental issues.

Eco Group has two major business divisions as Eco Paryavaran Engineers & Consultants Pvt. Ltd. and Eco Paryavaran Laboratories & Consultants Pvt. Ltd. The former caters to consultancy and providing engineering solutions for environmental pollution whereas the latter pertains to the analytical and consultancy services in the field of lab testing and environmental studies. Eco Paryavaran is North India's leading supplier of pollution control equipment with world-class infrastructure.

Eco Paryavaran Laboratories is NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited for ISO/IEC 17025:2017, approved by Ministry of Environment, Forest and Climate Change (MoEF&CC) & State Pollution Control Board (SPCBs) in the field of air, noise, wastes, water/wastewater and microbiological testing. Eco Paryavaran Laboratories & Consultants Pvt. Ltd. is also Government approved (ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018) and National Accreditation Board for Education and Training (NABET).

Team of Experts for the Study



S. No.	Name of Expert	Role of Expert	ID of Expert
1.	Dr. Sandeep Garg (Ph. D. & ME in Env. Sc., BE in Civil)	Managing Director <ul style="list-style-type: none"> ▪ NABL approved authorized signatory ▪ MoEF&CC approved govt. analyst ▪ NABET approved EIA Coordinator & Functional Area Expert ▪ Chairman IWE & Ex-Advisor, GMADA 	
2.	Dr. Rai Singh (Ph. D. & M. Sc. Env. Sc. P.G. Diploma in Industrial Safety, Health & Env.)	Dy. General Manager (Technical & Environment) <ul style="list-style-type: none"> ▪ MoEF&CC approved Govt. Analyst; ▪ NABL approved authorized signatory ▪ NABET approved Environmental Expert ▪ Worked in CPCB (2001-12) as Research Scientist 	
4.	Dr. Simranjit Kaur (M.Sc. & M.Phil.; Ph.D. in Solid Waste Management)	Deputy General Manager – EMS & Biological Lab Quality Manager – Analytical Division <ul style="list-style-type: none"> ▪ NABL Technical Assessor, ▪ NABL approved authorized signatory ▪ MoEF&CC approved govt. analyst ▪ NABET approved EIA Coordinator & Functional Area Expert 	
5.	Dr. Ajay Kumar	Chief Technical Officer Quality Manager <ul style="list-style-type: none"> ▪ NABL approved authorized signatory 	
6.	Mr. Navjot Singh (BE Electrical & specialization in MEP)	Manager (Projects)	
7.	Mr. Umesh Kumar (M. Tech – Nanotech)	Technical Manager & Sr. Laboratory Analyst (Environment & Chemical) NABL approved authorized signatory	



Approvals of Eco Laboratory

Approvals of Eco Laboratory

NABET ACCREDITATION CERTIFICATE

Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation


Eco Laboratories and Consultants Pvt Ltd, Mohali
 E 207, Phase VIII B, Sector 74, Industrial Area, SAS Nagar, Mohali

The organization is accredited as Category-A under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast only	1	1 (b)	A
2	Metallurgical industries	8	3 (a)	B
3	Cement plants	9	3 (b)	A
4	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
5	Distilleries	22	5 (g)	A
6	Sugar Industry	25	5 (j)	B
7	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
8	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
9	Building and construction projects	38	8 (a)	B
10	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated July 02, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACD/21/1936 dated Sept 10, 2021. The accreditation needs to be renewed before the expiry date by Eco Laboratories and Consultants Pvt Ltd, Mohali following due process of assessment.


 Sr. Director, NABET
 Dated: Sept 10, 2021

Certificate No.
 NABET/EIA/2023/RA 02 11

Valid up to
 Dec 17, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

NABL ACCREDITATION CERTIFICATE



National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

ECO LABORATORIES AND CONSULTANTS PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

ECO GROUP, ECO BHAWAN, E-207, INDUSTRIAL AREA, PHASE VIII-B, (SECTOR 74), MOHALL, PUNJAB,
INDIA

in the field of

TESTING

Certificate Number: TC-7477

Issue Date: 01/06/2021

Valid Until: 31/05/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : ECO LABORATORIES AND CONSULTANTS PVT. LTD.

Signed for and on behalf of NABL




N. Venkateswaran
Chief Executive Officer

MOEF&CC ACCREDITATION CERTIFICATE

रजिस्ट्री सं० डी० एन०-33004/99

REGD. NO. D. L.-33004/99



भारत का राजपत्र
The Gazette of India

असाधारण
 EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
 PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
 PUBLISHED BY AUTHORITY

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नई दिल्ली, बुधवार, फरवरी 28, 2018/फाल्गुन 9, 1939

No. 758]

NEW DELHI, WEDNESDAY, FEBRUARY 28, 2018/PHALGUNA 9, 1939

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अभिसूचना

नई दिल्ली, 28 फरवरी, 2018

NOTIFICATION

New Delhi, the 26th February, 2018

S.O. 857(E).—In exercise of the powers conferred by clause (b) of sub-section (1) of section 12 and section 13 of the Environment (Protection) Act, 1986 (29 of 1986), read with rule 10 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following further amendments in the notification of the Government of India in the erstwhile Ministry of Environment and Forests, number S.O. 1174(E), dated the 18th July, 2007, namely: -

In the Table appended to the said notification, -

(i) for serial numbers 1,17,24,26,30,39,41,45,81,86,87,93,94,95,96 and 100 the entries relating thereto, the following serial numbers and entries shall be substituted, namely: -

S.No.	Name of the Laboratory	Name of the Govt. Analyst	Recognition with effect from and valid up to
(1)	(2)	(3)	(4)
1	M/s Mantec Consultants Pvt. Ltd. D-36, Sector-VI, Noida-201301, Uttar Pradesh	(i) Mr. Gaja Nand Mallick (ii) Dr. Vivek Dwivedi (iii) Mr. Sumit Verma	26.02.2018 to 25.02.2023
17	M/s Idma Laboratories Limited	(i) Mr. Ankush Aggarwal	26.02.2018

[भाग II-खण्ड 3(i)]

भाग का समर्थन : असाधारण

5

	391, Industrial Area, Phase-I, Paunchkula-160019, Haryana	(ii) Mr. Niranjana Dev Behl (iii) Dr. Rajendra Kumar Jain	to 25.02.2023
24	M/s Newcon Consultants & Laboratories Pvt. Ltd. 8 th K.M. Stone, Delhi Meerut Road, Merta (Opp. Manan Dham Mandir), Ghaziabad-201003, Uttar Pradesh	(i) Mr. Pankaj Gupta (ii) Mr. Amit Kumar Singh (iii) Mr. Intekhab Khan	26.02.2018 to 25.02.2023
26	M/s Klean Laboratories & Research Pvt. Ltd. 402, Purushottam Plaza, Opp. Baner Telephone Exchange, Baner Road, Pune-411045, Maharashtra	(i) Mr. Vishwas Waman Kale (ii) Mr. Sanjay Kamalakar Mardikar (iii) Ms. Manjusha Gaikwad	26.02.2018 to 25.02.2023
30	M/s Lawn Enviro Associates, "Lawn House" #184-C, Vengalrao Nagar, Hyderabad-500038, Telangana	(i) Mr. Devireddy Nagarajuna Reddy (ii) Ms. Chevula Anuradha (iii) Ms. Vangani Pallavi	26.02.2018 to 25.02.2023
39	M/s Team Test House. (A Unit of Team Institute of Science & Technology Pvt. Ltd.) G-1-584, RIICO Industrial Area, Sitapura, Jaipur-302022, Rajasthan	(i) Mrs. Kavita Mathur (ii) Mr. Kedar Nath Mukhopadhyay (iii) Mr. Rajesh Maheshwari	26.02.2018 to 25.02.2023
41	M/s Envirochem Research & Test Labs Pvt. Ltd. HIG-79, Sector-E, Aliganj, Lucknow-226024, Uttar Pradesh	(i) Dr. Madan Mohan Agarwal (ii) Sh. Vivek Kumar Gupta (iii) Mrs. Saroj Singh	26.02.2018 to 25.02.2023
45	M/s Mineral Engineering Services 25/XXV, Club Road, Bellary-583103, Karnataka	(i) Mr. M. Sachin Raju (ii) Mr. M.R. Durga Prasad (iii) Mr. A.D. Yashwanth Arun Murthy	26.02.2018 to 25.02.2023
81	M/s Advanced Environmental Testing and Research Lab Pvt. Ltd. 63/1, Kailash Vihar, Near ITO, City Center-II, Gwalior-474011, Madhya Pradesh	(i) Mr. Rajesh Jain (ii) Dr. Dinesh Kumar Uchchariya (iii) Mr. Arvind Kumar Sharma	26.02.2018 to 25.02.2023
86	M/s Care Labs Plot No. 1, 3 rd Floor, Sai Sadan Complex, Shiva Ganga Colony, L.B. Nagar, Hyderabad-500074, Telangana	(i) Mr. K. Srinivasa Rao (ii) Ms. Gouthami Gangula (iii) Ms. P. Mamatha	26.02.2018 to 25.02.2023
87	M/s Green Circle Inc. Green Empire, Anupushpan Habitat Centre, Nr. Yash Complex, Above Axis Bank Ltd., Gotri Main Road, Vadodra-390021, Gujarat	(i) Mr. Pradeep Joshi (ii) Mr. Ram Raghav (iii) Ms. Shital Jashvantsinh Pamar	26.02.2018 to 25.02.2023
93	M/s Eco Laboratories & Consultants Pvt. Ltd. E-207, Industrial Area, Phase- VIII B, Sector-74, Mohali-160071, Punjab	(i) Mr. Sandeep Garg (ii) Ms. Simranjit Kaur (iii) Dr. Deepika Thakur	26.02.2018 to 25.02.2023
94	M/s Hubert Enviro Care Systems Pvt. Ltd. No. 18, 92 nd Street, Ashok Nagar, Chennai-600083, Tamil Nadu	(i) Dr. J.R. Moses (ii) Dr. Rajkumar Samuel (iii) Mr. A.K. Natarajan	26.02.2018 to 25.02.2023
95	M/s Nawal Analytical Laboratories Plot No. 100, New SIDCO Industrial Estate, Sri Nagar, Hosur-635109, Tamil Nadu	(i) Mr. D. Balakrishnan (ii) Ms. S. Elamathi (iii) Mr. K.B. Krishnamoorthy	26.02.2018 to 25.02.2023

 Approved



ISO 9001: 2015 Certificate

Certificate of Registration

This is to Certify that
 Quality Management System of

**ECO PARYAVARAN ENGINEERS &
 CONSULTANTS PRIVATE LIMITED**

E-204 & 205, INDUSTRIAL AREA, PHASE VIII B (SECTOR-74),
 MOHALI-160071, PUNJAB, INDIA.

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

DESIGNING, MANUFACTURING, SUPPLY AND COMMISSIONING OF
 POLLUTION CONTROL EQUIPMENTS.

Certificate No	: 22IQJH70	Issuance Date	: 21/04/2022
Initial Registration Date	: 21/04/2022	Date of Expiry	: 20/04/2025
1st Surve. Due	: 21/03/2023	2nd Surve. Due	: 21/03/2024



Director



ACCREDITED
 Management Systems
 Certification Body
 MSCB-119



AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail : info@aqcworld.com.

Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India.

*Validity of the Certificate is subject to successful completion of surveillance audits on or before of due date. In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn.

Certificate Verification: Please Re-check the validity of certificate at <http://www.aqcworld.com/certificate.aspx> or www.aqcworld.com at Anytime.
 Certificate is the property of AQC Middle East LLC and shall be returned immediately when demanded.





ISO 14001: 2015 Certificate

Certificate of Registration

This is to Certify that
 Environmental Management System of
ECO PARYAVARAN LABORATORIES & CONSULTANTS PRIVATE LIMITED
 E-207, INDUSTRIAL AREA, PHASE VIII B (SECTOR-74), MOHALI-160071, PUNJAB, INDIA.

has been assessed and found to conform to the requirements of
ISO 14001:2015
 for the following scope :

TESTING SERVICES IN BIOLOGICAL, CHEMICAL AND MECHANICAL CATEGORIES & EIA CONSULTANTS FOR PREPARING EIA/EMP REPORTS.

Certificate No	: 22IEJS76	Issuance Date	: 21/04/2022
Initial Registration Date	: 21/04/2022	Date of Expiry	: 20/04/2025
1st Surve. Due	: 21/03/2023	2nd Surve. Due	: 21/03/2024

[Signature]
Director

AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail: info@aqcworld.com
 Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India.
 *Validity of the Certificate is subject to successful completion of surveillance audits on or before of due date. (In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn).
 Certificate Verification: Please Re-check the validity of certificate at <http://www.aqcworld.com/activeclients.aspx> or www.aqcworld.com at Active Clients.
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IAS ACCREDITED
 Management Systems
 Certification Body
 MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF





ISO 45001: 2018 Certificate

Certificate of Registration

This is to Certify that
 Occupational Health & Safety Management System of

ECO PARYAVARAN LABORATORIES & CONSULTANTS PRIVATE LIMITED

E-207, INDUSTRIAL AREA, PHASE VIII B (SECTOR-74), MOHALI-160071,
 PUNJAB, INDIA.

has been assessed and found to conform to the requirements of

ISO 45001:2018

for the following scope :

TESTING SERVICES IN BIOLOGICAL, CHEMICAL AND MECHANICAL
 CATEGORIES & EIA CONSULTANTS FOR PREPARING EIA/EMP REPORTS.

Certificate No	: 22IOJA85	Issuance Date	: 21/04/2022
Initial Registration Date	: 21/04/2022	Date of Expiry	: 20/04/2025
1st Surve. Due	: 21/03/2023	2nd Surve. Due	: 21/03/2024

[Signature]

Director



AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail: info@aqcworld.com

Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India.

**Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. (In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn.)*

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Approvals of Eco Experts





Acknowledgement



Acknowledgement

Eco Paryavaran Laboratories and Consultants Pvt. Ltd. is thankful to the Management and the Principal/Director of Khalsa College Amritsar for entrusting processes of Green auditing with us.

We thank all the participants of the auditing team especially students, faculty and non-teaching staff who took pain along with us to gather the data through survey.

We also thank the office staff who helped us during the document verification.

For Eco Paryavaran Laboratories and Consultants Pvt. Ltd.



******* End of Report *******