

GREEN AUDIT – 2017-18



St. ALBERTS COLLEGE (AUTONOMOUS)

ERNAKULAM, KERALA

EXECUTED BY



ATHUL ENERGY CONSULTANTS PVT LTD

4th FLOOR, CAPITAL LEGEND BUILDING,
KORAPPATH LANE, ROUND NORTH, THRISSUR, KERALA-680020
Ph: +91 735611199/0-6 Web: www.athulenergy.com E-Mail: info@athulenergy.com

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PREFACE

Every institution should be imparting knowledge about the campus environment and its surroundings through activities that follows the principles of sustainability. Hence an evaluation is needed to understand where it stands in the path to be an environment friendly, talent nurturing educational institution. This Green Audit was done with the aim to assess and rate the sustainable nature of the campus.

This report is compiled by the BEE certified energy auditor along with the project engineers who are experienced in the field of energy, environment and management. The student volunteers made a mammoth contribution with data collection and preparing an initial skeleton for the report.



ACKNOWLEDGEMENTS

We express our sincere gratitude to the M/s St. Albert's College Ernakulum for giving us an opportunity to carry out the project of Green Audit. We are extremely thankful to all the staffs for their support to carry out the studies and for input data, and measurements related to the project of Green audit.

St Albert's College – TEAM

- | | | |
|----|--|--------------------------------------|
| 1. | <i>Rev. Fr. Antony Arackal</i> | <i>Rev. Fr. Antony Arackal</i> |
| 2. | <i>Rev. Fr. Christy David Pathiala</i> | <i>Assistant Manager</i> |
| 3. | <i>Fr. Joseph Sherin Chemmayath</i> | <i>Assistant Manager</i> |
| 4. | <i>Dr. M.L. Joseph</i> | <i>Principal</i> |
| 5. | <i>Dr. V.S. Sadanandan</i>
<i>Dr. Titus Correya</i> | <i>Vice Principals</i> |
| 6. | <i>Dr. Ajith Thomas John</i> | <i>IQAC coordinator</i> |
| 7. | <i>Dr. J. Jameson, Coordinator</i> | <i>Coordinator, Green Audit Team</i> |
| 8. | <i>Dr. Amal Joseph P.J.</i> | <i>Secretary Green Audit Team</i> |

Also congratulating our Green audit team members for successfully completing the assignment in time and making their best efforts to add value.

GREEN AUDIT TEAM

1. Mr. Santhosh A

Registered Energy Auditor of Bureau of Energy Efficiency (BEE – Govt. of India)
Accredited Energy Auditor No – EA 7597

2. Mr. Ashok KMP Energy Manager

Yours faithfully



Managing Director
Athul Energy Consultants Pvt Ltd



GREEN AUDIT SUMMARY

- ❖ St. Albert's College Management taken considerable effort for maintaining the green and sustainable campus.
- ❖ Staff and students in collaboration with NSS is held responsible for maintenance of greenery inculcating a sustainable culture among the student community.
- ❖ Well maintained open ground and auditorium is maintained by the college

Suggestions for improvement

- ❖ Sub metering system for water consumption to be done in each areas of main usage
- ❖ Display boards are to be placed in the campus for plants and gardens.
- ❖ Nashtravanam or star Garden Street on the way to college boundary sides. Every students have particular star and the responsibility of maintaining those star plants or star boundary wall can be given to them.
- ❖ Practice Institutional Ecology- Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation.
- ❖ Listing of plants and species in the college campus to be identified and marked
- ❖ Herbal , botanical and vegetable garden to be nurtured and maintained



GENERAL DETAILS

The general details of the St. Albert's College are given below in table.

Table 1 GENERAL DETAILS

Sl. No:	Particulars	Details
1	Name of the College	St. Albert's College (Autonomous)
2	Address	Banerjee Road, Ernakulum Kerala, India - 682018
3	Contact Person	Dr. Ajith Thomas John, IQAC Coordinator,
4	Contact Phone numbers	0484-2394225
5	E-mail ID	principal@alberts.ac.in
6	Web site	www. alberts.ac.in
7	Type of Building	Educational Institution
8	Annual Working Days	210
9	No: of Shifts	Day Shift (One) (8 AM -1.30 PM)
10	No: of students enrolled	2560
11	No : of teaching staff	141
12	No: of non-teaching staff	42
13	Total campus area	13.63
14	Total Built Up area	10406 sq.ft
15	Herbal Garden	No
16	Vegetable garden	No
17	Fish pond	Yes
18	Aqua farm	Yes
19	Play Grounds	Open Natural Football ground , basketball ground
20	Open auditorium	01number
21	Rain water harvesting	No



ABOUT ST. ALBERT'S COLLEGE

St. Albert's College is an Autonomous Institution situated at the heart of the city of Kochi, affiliated to the Mahatma Gandhi University, Kottayam and is functioning under the management of the Archdiocese of Verapoly. The seeds of this portal of higher learning had already been sown when St. Albert's High School commenced its functioning in the year 1892. On August 18, 1898 the school got the recognition of Madras University. This has been a premier centre of learning for the young male children of wider Cochin area from its very inception. The College owes its origin to the foresight and sagacity of its Founder Patron, The Most Rev. Dr. Joseph Attipetty the first Indian Archbishop of the Archdiocese of Verapoly. His Grace, a noble prelate of rare vision and saintliness, was of the view of promoting higher education among his flock. It was with this vision that His Grace ventured upon the onerous mission of starting a College. The laboriousness of this colossal project, however, was shared by the selfless and devoted service of the Rt. Rev. Msgr. Alexander Lenthaparambil, the then Vicar General of the Archdiocese. Also in the forefront was the Very Rev. Msgr. Joseph Vaipicherry, who took charge as the Manager of both the High School and the College and also the Secretary to the College Governing Body.

The College was ISO 9001:2001 certified by TUV Rheinland in 2007 and re-certified every three years. **St Albert's College** was nationally accredited with A-Grade, with a CGPA of 3.24 out of 4 in the third cycle of NAAC in 2016. In 2016 March, the University Grants Commission granted Autonomous status to the College.



GREEN AUDIT

The whole world is on the road to a sustainable development, and the environment conservation is the top priority among the list as every human activity has its effect on their surroundings, which is the environment. Hence be it a house, a commercial building, an industrial building, or any other construction will disturb the balance of the environment. It is very important to do a detailed study about the effects on the environment. This is conducted under the name of *Green Audit*, which can be defined as *the official examination of the effects a company or other organisation has on the environment, especially the damage that it causes.*



CAMPUS ENVIRONMENT

The environment in and around the college campus plays an important part in maintaining a healthy atmosphere in nurturing talents. Trees are the major source of the oxygen we breathe, and receiver of the carbon dioxide we exhale. The sustainability of an ecosystem depends on the number of plants and trees in and around the surroundings. The open space in the college is used for gardening and area peace garden etc.

Scientific studies are proved that the nature can able to cure any diseases and this will reduce the stress among students during their studies and also increase the compassion among them and to nature. Ultimately the campus is maintaining natural equilibrium trees, birds and water bodies with human beings. Gardens and landscape are an aesthetic delight and it promotes attentiveness of students. Persons exposed to plants have higher level of positive feelings (pleasant, calm) as opposed to negative feelings (anger, fear).

CONSTRUCTION OF BUILDINGS

Energy consuming devices installed to achieve the comfort levels for the occupants of the building gives rise to heat generation which adversely affects the environment within the building and in the surrounding. Buildings are thus the major pollutants that affect the urban air quality and contribute to climate change. Buildings are the major consumers of energy during their construction, operation and maintenance.

St. Albert's College has developed an ecological design in their buildings and adopted minimum negative impact on ecosystem. Their approach to the constructional activities consciously is to conserve energy and ecology and avoid the adverse effects of ecological damage.

CARBON DIOXIDE LEVELS

Air quality is a major area of concern inside a building. The percentage share of oxygen and carbon dioxide should be such that the occupants are able to perform their tasks without any discomfort. This is generally done through a provision of fresh air duct for the air conditioning systems or by providing windows. Numerous factors need to be considered for the design and fabrication of the fresh air supply system like the number of occupants, weather pattern and air quality of the location, and so on. For the human comfort, production of carbon-dioxide (CO₂) within a building space is the prime area of consideration. This is associated with respiration which produces CO₂. As a result, the carbon-dioxide levels will increase if ventilations are not provided.

As per various standards (like the ASHRAE Standard 62.1-2016), indoor CO₂ concentrations up to 1200 ppm is considered acceptable. For a typical outdoor condition, this value may change from 300 to 500 ppm.

The measurements were recorded along different locations inside the campus and the peak values are given in the following sections. The key concentration was on the study of carbon dioxide levels.

Table 2 CARBON DIOXIDE LEVELS

Sl. No.	AREA	Measured CO ₂	Standard CO ₂ level (Range)	Remarks
Main Block				
1	Chemistry class room	475	300-500	Good
2	Administrative office	495	300-500	Good
3	Principal Office	590	300-500	Good
4	Front Office	460	300-500	Good
AIM Block				
1	Class Room	450	300-500	Good
2	Corridor	445	300-500	Good
3	Library	510	300-500	Good
4	Dept. Of Management	540	300-500	Good
5	Front Office	320	300-500	Good
Miscellaneous				
1	Canteen	550	300-500	Good
2	Seminar hall	450	300-500	Good



HERBAL GARDEN

The literal meaning of Ayurveda is “science of life,” because ancient Indian system of health care focused on views of man and his illness. It has been pointed out that the positive health means metabolically well-balanced human beings. Ayurveda is also called the “science of longevity” because it offers a complete system to live a long healthy life. It is an interactive system that is user-friendly and educational. It teaches the patient to become responsible and self-empowered. It is a system for empowerment, a system of freedom, and long life. A significant part of knowledge and tradition is currently being eroded due to modernization, acculturation and availability of alternatives. Therefore, it is urgent to inculcate young minds to realize the fascinating knowledge and tradition associated with these resources, and help them understand the immense potentials the Kerala medicinal plants possess for the future.

The “Promoting Herbal Gardens in Schools and colleges” has been a fun-filled learning activity for the students where they got the opportunity to learn about the medicinal plants by actually planting the medicinal herbs and watching them grow in their gardens, and by exploring information about them from various sources.

Recommendation

We recommend to develop an herbal garden in the college campus in the sides or on the back yard of the college.

VEGETABLE GARDEN

It is a garden that exists to grow vegetables and other plants useful for human consumption. Gardening can provide students with hands-on learning opportunities while increasing environmental awareness and vital experience in problem-solving. The school gardens are changing the eating habits of the students

Gardens are a wonderful way to use the college campus as a classroom, reconnect students with the natural world and the true source of their food, and teach them valuable gardening and agriculture concepts and skills that integrate with several subjects, such as math, science, art, health and physical education, and social studies, as well as several educational goals, including personal and social responsibility. They gain self-confidence and a sense of "capableness" along with new skills and knowledge in food growing — soon-to-be-vital for the 21st century students become more fit and healthy as they spend more time active in the outdoors and start choosing healthy foods over junk food.

Recommendation

St. Albert's college can take initiative to develop and nurture a vegetable garden in the college campus.

LIVING BOUNDARY WALL

The college is tried to maintain separate microclimatic zone in the urban city of Ernakulum by maintaining a thin and in certain areas by providing one row of trees around the college. Due to this boundary layer protects the college from dust and noise pollution to certain extent. By this we can slightly change the temperature and humidity, particulate matter, oxygen concentration, carbon dioxide levels are different from the city and thus maintaining a comfort atmosphere to students.

Recommendation

We recommend to provide thick boundary with trees around college boundary wall to reduce the noise, dust pollution and it gives a different aesthetic look to the college

TREES IN THE CAMPUS

Trees release oxygen when they use energy from sunlight to make glucose from carbon dioxide and water. Like all plants, trees also use oxygen when they split glucose back down to release energy to power their metabolisms. Averaged over a 24-hour period, they produce more oxygen than they use up; otherwise there would be no net gain in growth.

Recommendation

We recommended to take the list of trees and maintain well. To build a Nashtravanam or star Garden Street on the way to college boundary sides.

AQUACULTURE

The development of ponds and women's fish farming groups has significantly increased awareness of the value of nutrition and fish consumption in rural households by teaching school-age children and adult women about aquaculture. Capitalize on an ecologically balanced and sustainable lake and pond management program that rewards you with the peace of mind to know you have a comprehensive, all-inclusive program in place that takes away the burden of management, leaving you with all the benefits of an aesthetically pleasing aquatic ecosystem that is a focal point for the campus

St. Albert's college maintaining a 2 acres of aqua region just 8 Km away from college campus. This aqua region helps the college students and staff created and cultivated different perspectives on nature and helps them for the academic studies.

OPEN AUDITORIUM

Three auditoriums are maintained in the college, one Open auditorium in the AIM building, two Indoor auditorium. The stage is located in the centre like open theatre. Nature playing a vital role in this stage because it will create only sound not echo or noise during the show. Due to the leaves of the plants will absorb all the echo reverberated from the buildings. Due to the stage is designed in open model the sound reflections are less also giving a scenic beauty to the college.

Education is incomplete without sports and games. Sports and games **are beneficial in teaching us punctuality, responsibility, patience, discipline, and dedication towards our goal.** The importance of games and sports in student's life is immense. It has proved to be very therapeutic in nature. Sports help improve social skills, such as dispute management and sport-based interaction and they need to be energetic, physically active, and mentally fit. By understanding the responsibility to make its students healthy ST. Albert's College Management has built and maintained football ground, cricket ground in green surroundings.

WATER RESOURCES AND CONSERVATION

The requirement of water for the college, and gardening etc are met by supply by KWA and well inside of college campus. The water is collected in one main tanks and it is located in main block the water from different wells are checked in an accredited laboratory in time to time to ensure its pot ability. Water flow diagram shown below will gave the exact picture of water flow in the college.

1. WATER RESOURCES

There are only one well and one bore well in the college.

TABLE 3: WATER SOURCES

Location	Source
Campus	KWA
Near canteen	Well
Campus	Bore Well



2. GROUND WATER RECHARGING

Rainwater harvesting (RWH) is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). One method of rainwater harvesting is rooftop harvesting. With rooftop harvesting, most any surface — tiles, metal sheets, plastics, but not grass or palm leaf can be used to intercept the flow of rainwater and provide a household with high-quality drinking water and year-round storage. Other uses include water for gardens, livestock, and irrigation, etc.

Rainwater harvesting for ground water recharge.

Aim and Objectives:

- Conservation of rainwater for future use
- To use rainwater for gardening Activity: Conservation of rainwater in soil or in a container is known as rainwater harvesting.

The rainwater from entire roof top of building is to be collected through PVC pipes and Rain water collection tank to be installed in the college campus.



CONCLUSION:

Green Audit is the most efficient & ecological way to solve such an environmental problem. Green Audit is one kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. Green audits can “add value” to the management approaches being taken by the college and is a way of identifying, evaluating and managing environmental risks (known and unknown). The green audit reports assist in the process of attaining an eco-friendly approach to the development of the college.