

GREEN AUDIT - 2022-23



SREE AYYAPPA COLLEGE

ERAMALLIKKARA, ALAPUZHA

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

April 2023



TABLE OF CONTENTS

PREFACE	4
ACKNOWLEDGEMENTS	5
GENERAL DEATAILS	6
ABOUT SREE AYAPPA COLLEGE -CHENGANNUR	7
GREEN AUDIT	8
CAMPUS ENVIRONMENT	9
SUSTAINABLE CONSTRUCTION OF BUILDINGS	10
CARBON DIOXIDE LEVELS	11
1. HERBAL GARDEN	11
2. KUTTIVANAM (SMALL FOREST)	12
3. VEGETABLE GARDEN	14
4. SILENT ZONE	15
5. OPEN GROUNDS	15
WATER AUDIT	16
1. WATER RESOURCES	17
GROUND WATER RECHARGING	17
COLLEGE OUT REACH ACTIVITIES	19
CONCLUSION:	19

LIST OF TABLES

TABLE 2 CO2 LEVELS IN BUILDING	11
TABLE 4 LIST OF WATER TAPS.....	17

LIST OF FIGURES

Figure 1 MAIN BUILDING

Error! Bookmark not defined.



FIGURE 2: CAMPUS VIEW	9
FIGURE 3: BUILDING VIEW	10
FIGURE 4: HERBAL GARDEN IN COLLEGE LOCATION	12
Figure 5 KUTTIVANAM	13
Figure 6 VEGETABLE GARDEN	14
Figure 7 SILENT ZONE	15
Figure 8 OPEN GROUND	16
Figure 9 WATER DISTRIBUTION DIAGRAM	16
Figure 10 WATER SOURCES	17
Figure 11 RAIN WATER COLLECTION STORAGE	18



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. The college vision is “to enlighten and empower women in rural and suburban society and enable them to act as agents of social transformation and acquire knowledge of self and surroundings and to make the world a better place”. And in the **social goals**, it is written as “**to make the students aware of the pressing global issues and the moral responsibility to handover to the coming generation an eco-friendly life style and an earth free from pollution, filth, bigotry and corruption**”. It was observed by us from the students’ participation during the green audit.



ACKNOWLEDGEMENTS

We express our sincere gratitude to the management of Sreeyappa College, Eramallikkara 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.

- | | |
|------------------------|-----------------------------------------|
| 1. Adv K Anandagopan | President, Travancore Devaswom Board |
| 2. Adv S S. Jjeevan | Member, Travancore Devaswom Board |
| 3. G Sundareshan | Member, Travancore Devaswom Board |
| 4. G Baiju | Secretary, Travancore Devaswom Board |
| 5. Prof.(Dr.) Suresh S | Principal, Sree Ayyappa College |
| 6. Smt P K Sobha , | Convener, IQAC, Sree Ayyappa College |
| 7. Dr Ganga .G | Coordinator, NAAC, Sree Ayyappa College |

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. Er. Santhosh A

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

2. Er. Ashok KMP

Energy Auditor EA-34760/22-of Bureau of Energy Efficiency, GRIHA Certified Professional

3. Er. Harikrishnan K

Certified Energy Manager – EM-11755/23



Yours faithfully

Managing Director
Athul Energy Consultants Pvt Ltd

GENERAL DEATAILS

The general details of the M/Sree Ayappa College Ermallikkara Chengannur are given below in table.

Table 1 GENERAL DETAILS

Sl. No:	Particulars	Details
1	Name of the College	Sree Ayappa College
2	Address	Ermallikkara , Chengannur , Alapuzha -689109
3	Contact Person	Dr. Ganga .G , NAAC Co Coordinator
4	Contact Number & E mail of the college	0479-2427615. sreeayappacollege@gmail.com
5	Web site	www.sreeayappacollege.ac.in
6	Type of Building	Educational Institution
7	Annual Working Days	210
8	No: of Shifts	Day Shift (One) (9:00 AM -4:00 PM)
9	No: of students enrolled	180
10	No: of teaching & non-teaching staff	Teaching – 19. Guest Teaching -18 - Non-teaching – 05 Temporary Non-teaching 16
11	No: of departments	08
12	Total Land Area	48000 M ²
13	No: of Programmes	UG – 07 and PG -01

ABOUT SREE AYAPPA COLLEGE -CHENGANNUR

Sree Ayyappa College, owned and managed by The Travancore Devaswom Board, started functioning in 1995 under colleges included under Section 2(f)/12(B) of UGC Act 1956, as the fulfilment of a long cherished dream of the rustic populace of the serene and beautiful hamlet of Eramallikkara, situated at the confluence of the twin-rivers, holy Pampa and Manimala. As the manifestation of the bounteous blessings of Lord Ayyappa, the Kaliyuga Varadan, this abode of learning proves to be a fountain of prosperity and fortune to this educationally underdeveloped remote area in Thiruvananthapuram Panchayat, of epic importance. The Government policy of starting diverse and applied-science courses in the rural sector, with the object of providing more and more job opportunities to aspiring and ambitious youth, culminated in the establishment of this institution. The Travancore Devaswom Board, with the aim of spreading the light of knowledge to especially underdeveloped, remote and rural population, in order to groom genuine geniuses for the service of society and humanity at large, started this college as its fourth one in the field of higher learning.

VISION

Transcending barriers through knowledge and service.

Sree Ayyappa College was started with the vision of creating a scientifically developed, humanely rich, morally responsible community, ensuring equitable regional development through education; To create a future India, where narrow frontiers are erased through globally relevant and regionally sensitive quality education that aims at fostering a scientific attitude tempered with literary and artistic sensibility, sense of national integration and concern for fellow beings; To have a futuristic outlook while being rooted in our culture and heritage; To pursue knowledge with stress on humanitarian values.

MISSION

To be an instrument for rural youth to attain holistic development

Making ICT- based education accessible to educationally underprivileged areas, thereby attempting to bridge the digital divide.

Creating manpower that is intellectually trained, professionally skilled, morally righteous, spiritually developed and value oriented responsible citizens committed to the service of the society, dedicated to the spirit of the constitution, and sensitive to the needs of the Environment.

Applying knowledge for the meaningful solution of human problems.



Figure 1 MAIN BUILDING

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 organization has on the environment, especially the damage that it causes*. The objectives of the green audit can be listed as follows:

- Including participants from every section of the organization in the auditing process.
- Understanding the environment by drawing a simple sketch of the total area.
- Identifying the activities in the premises and listing them.
- Calculating the resource consumption like the land and water.
- Assessing the waste management and disposal.
- Study the energy usage pattern.
- Identify the good practices.
- Suggest the viable solutions to improve the sustainable nature of the institution.
- Compile the report with the above-mentioned details.
- Conduct a walkthrough audit to check the suggestions implemented by the institution and suggest for further improvements
- Verify all the points with actual measurements is it is meeting the performance and gave suggestions for improvement

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

Ultimately the campus is maintaining natural equilibrium with open spaces, buildings, trees along with human interactions



FIGURE 2: CAMPUS VIEW

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).



SUSTAINABLE 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.

Sree Ayappa College Changannur 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.

Sree Ayappa College Changannur management constructed the building to optimum utilisation of land and classrooms and with abundant light and natural ventilation. Maximum day light ingress and natural ventilation increases the indoor air quality and avoid the sick building syndrome. The whole facility and buildings are designed to maximum and optimum utilisation of land without affecting the natural hill area



FIGURE 3: BUILDING VIEW

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 CO₂ LEVELS IN BUILDING

Sl. No.	AREA	Measured CO ₂	Standard CO ₂ level (Range)	Remarks
Main Block				
1	Class room Mathematics	550	300-500	Good
2	Corridor	625	300-500	Good
4	HOD room Computer Science	600	300-500	Good
1	Class room Electronics	550	300-500	Good
3	HOD Room Electronics	530	300-500	Good
4	Principal Office	480	300-500	Good
5	Office	460	300-500	Good
Miscellaneous and others				
1	Seminar Hall	550	300-500	Good
2	Ladies Hostel	560	300-500	Good

1. 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.



FIGURE 4: HERBAL GARDEN IN COLLEGE LOCATION

The task of making the garden itself has been enriching in terms of making students realize the importance of teamwork such as detailed planning, and allocation of tasks within a team. For the teachers, herbal garden project has been useful in terms of ease with which they could integrate the concept with other subject matter activities, such as writing essays, poems and stories, making posters, drawing and painting, making herbariums, and even preparing food recipe using some of the culinary herbs students have planted in their gardens. Kerala Government is also making lot of initiatives to developing and inculcating the herbal gardens in schools and colleges.

2. KUTTIVANAM (SMALL FOREST)

Sree Ayappa College Changannur developed an untouched and protected version of forest just 1 km away from college . This is maintaining in the form of old tradition such as Kavuvu, the small untouched forest which we can able to see in most parts Kerala. Kavuvu is maintained as forest areas that human beings are mostly prohibited and considered a sacred place in the Keralite. The location of Kuttivanam is side of college area which is an untouched and silent zone in the college.



Figure 5 KUTTIVANAM

Such a place can have following benefits to the ecosystem.

1. **Maintain the equilibrium of air and food:** Humans and animals need food and oxygen and excrete carbon dioxide and water. The plants, algae, etc, in the Kuttivanam use carbon dioxide and water and release or produce oxygen and food.
2. **Filter and store water, and drastically reduce storm-water runoff:** Forests filter and regulate the flow of water. The litter over the forest floor acts as a sponge which filters, stores and gradually releases the water to natural channels and ground water.
3. **Conserve valuable topsoil and reduce soil erosion:** A forest is like a protective green cloth over Mother Earth's fragile body.
4. **Conserve biodiversity and balance ecology:** In a natural environment, the populations of species are balanced to an optimum minimum level
5. **Reduce pollution:** Plants can remove and/or Phyto remediate pollutants and contaminants from soil and water.
6. **Arrest or reverse global warming:** Global warming can cause extinction of species, tropical cyclones, extreme weather, tsunamis, abrupt climatic change, sea level rise, increased human stress resulting in violence, etc. These are just a few of its catastrophic effects. Plants can lock CO₂ in their bodies to save our planet and the life on it.



3. 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 vegetable gardens are changing the eating habits of the students. Vegetable garden is created by college in limited area in the outside of Ladies Hostel

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.



Figure 6 VEGETABLE GARDEN



4. SILENT ZONE

Now a day's silent zones are getting important in academic institutions. The noise pollution leads to stress and other medical and neurotic problems to children's and also creativity and absorption capacity of knowledge is also going down. For reduction of academic stress level there is apace for complete relaxation which gives the importance of silence zone. Sree Ayappa College Changannur have aerated certain silent zones in the college itself. . Natural silence zones are also crated in the outskirts of college campus where there is no sound other than natures sound.



Figure 7 SILENT ZONE

5. OPEN GROUNDS

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 stronger social skills, such as dispute management and sport-based interaction. **Sports inculcate the feeling of fairness in a child and it encourages them to be committed, taking defeat in a positive manner.** It teaches us to be joyful, united, and appreciative in life. Students are the youth of our Nation, and they need to be energetic, physically active, and mentally fit. By understanding the responsibility to make its students as healthy Sree Ayappa College Changannur built and maintained football ground, volley and badminton court in a greenery surroundings.



Figure 8 OPEN GROUND

WATER AUDIT

The requirement of water for the college, hostels and gardening etc are met by supply from three open wells(Two in college campus and one women’s Hostel) The water from OPEN wells are collected in the tanks located in the top floor of building Details are given in below figure. The water from different wells are checked in an accredited laboratory in time to time to ensure its pot ability.

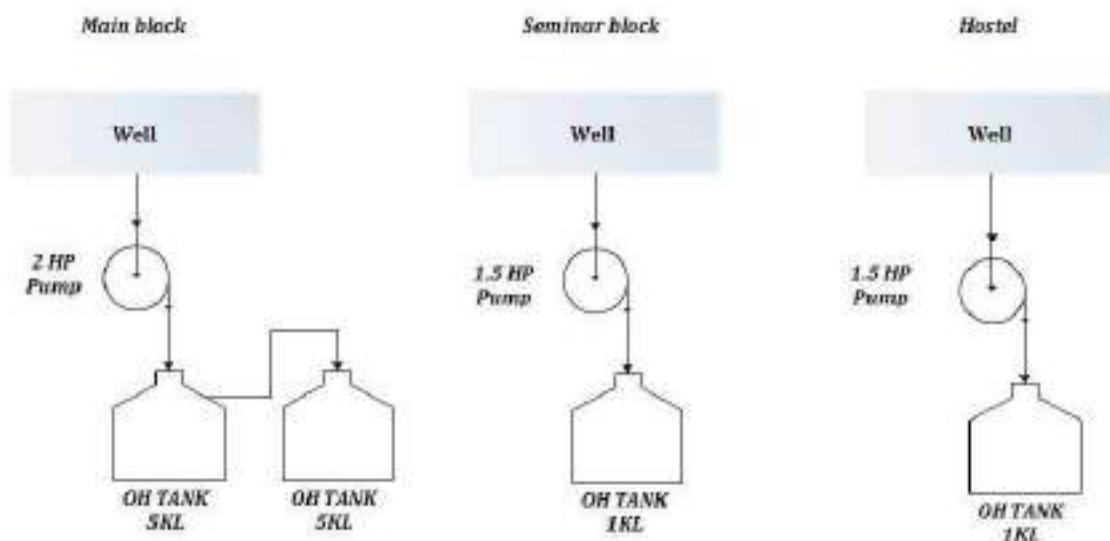


Figure 9 WATER DISTRIBUTION DIAGRAM

1. WATER RESOURCES

There are Three well which are demonstrated in water circuit diagram. UTILITIES

The labs have the highest tap points whereas the toilet accounts for the major consumption. The water outlet points in the college campus l are listed in the following table.

Table 3 LIST OF WATER TAPS

Location	No: of taps
Washing area taps	12
Toilets for students	18
College compound and garden	06
Staff rooms	10
Hostel	18
Total	64



Figure 10 WATER SOURCES

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). There are different methods for artificial rain water harvesting. Ground water Recharging by different means and collection of rain water for direct use by installation of rain water Collection tank. Ground water recharging methods are decided by detailed study of rain fall, geological And hydrogeological mapping of the area etc. Another method of rainwater harvesting is rooftop

Harvesting.



Figure 11 RAIN WATER COLLECTION STORAGE

Rainwater harvesting for ground water recharge.

Advantages

- Conservation of water for future use
- Biological purity of water is good
- It is environment friendly, controls soil erosion and flood and provides sufficient soil moisture even during summer months
- It provides a natural distribution system between recharge and discharge points
- Quality improvement by infiltration through the permeable media
- Water stored underground is relatively immune to natural and man-made catastrophes



COLLEGE OUT REACH ACTIVITIES

College is conducting certificate course on Sustainable Development of duration of 35Hours. This is need of the hour to encourage and enlighten the students.

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.

The auditors observed during the campus visit and after the conversation with the staff and students of M/s Sree Ayappa College Changannur that they have taken continuous and considerable effort in several years for nurturing and maintaining the green coverage over the campus which is being well appreciated by us.



GREEN RATING FOR INTEGRATED HABITAT ASSESSMENT

GRIHA CERTIFIED PROFESSIONAL CERTIFICATE

This is to certify that

Ashok K M P

has qualified as a **GRIHA** Certified Professional For V. 2015

Date of issue: 19th June 2020

Note : This certification is valid only for GRIHA version 2015.

Chief Executive Officer
GRIHA Council