ENVIRONMENT AUDIT – 2022-23

SREE NARAYANA GURU COLLEGE

CHELANNUR, KOZHIKODE

KERALA

EXECUTED BY

ATHUL ENERGY CONSULTANTS PVT LTD

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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 and waste management. Hence an evaluation is needed to understand where it stands in the path to be an environment friendly, and in talent nurturing educational institution.

This Environment Audit was done with the aim to assess mainly on waste management of the campus. The college vision is "To become a centre par excellence of learning, where the best in humans is unveiled, based on human values, focused on life enhancement and constructive in adapting to the needs of the world". The mission of college is "to mould individuals into successful and vibrant professionals facilitating comprehensive and rounded formation, to function as effective and empathetic human beings, grounded with courage of conviction, personal integrity, professional ingenuity and social commitment "and it was we observed by us from the students' participation during the environmental audit.

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 in preparing an initial skeleton for the report.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the management of M/s Sree Narayana Guru College Chelannur, Kozhikode 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	Dr. Kumar S.P	Principal
2	P. M. Raveendran	S.N Trust Executive member

ENVIRONMENT 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. G. Krishnakumar ISO 140001 Environment management Lead auditor

Yours faithfully

ATHUL ENERGY CONSULTANTS PVT LTD THRISSUR 680 020

Managing Director
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ENVIRONMENT AUDIT SUMMARY

- College segregated the waste from college, canteen, and hostels and treated in a scientific manner.
- Separate storage provisions are done for metal and plastics in college.
- Biodegradable wastes are treated in a biogas plant installed behind the canteen.
- Non-biodegradable wastes are incinerated which installed near the playground.
- Bio gas plant is installed behind Nazareth Block for treating food wastes from hostel mess and canteen.

Suggestions for improvement

- Internal inspection team to be formed which comprises of staff and students for internal auditing of the waste management in the campus
- Introduce 'refuse plastic' concept in college inventories. This will increase the awareness among students and staffs and will seep into their behaviour.
- Display the weight of segregated wastes that collected from the canteen, hostels and college in prominent locations which will be an eye-opener for all and it will help in reduce the waste generation.
- Monthly Records should be kept for segregated wastes which will give the administration to pinpoint the source and can take necessary steps to reduce it.

GENERAL DETAILS

The general details of the Sree Narayana Guru College are given below in table.

Sl. No:	Particulars	Details
1	Name of the College	Sree Narayana Guru College, Chelannur
2	Address	Sree Narayana Guru College, Kozhikode Balussery Rd, Chelannur, Kozhikode, Kerala 673616
		Kozhikode -673616
3	Contact Person	Dr. Anusmitha, Ph: 9961777677
4	Contact number &	0495-2260495
	E mail	sngcollege2007@yahoo.com
5	Web site	www.sngcollegechelannur.edu.in
6	Type of Building	Educational Institution
7	Annual Working Days	210
8	No: of Shifts	Day Shift (One) (9AM -4PM)
9	No: of students enrolled	1235
10	No: of teaching staff	33
11	No: of non-teaching staff	17
12	No: of departments	19
13	No : UG courses	07
14	No: of PG courses	04
15	Total campus area	67 Acre
16	Total Built Up area	6927 m^2
17	No: of hostel	01(Women) &Sports Hostel for Gents

TABLE 1: GENERAL DETAIS

SREE NARAYANA GURU COLLEGE CHELANNUR

Sree Narayana Guru College, Chelannur, is situated at the foot of the towering Kalari Hills, in a quiet village about 14 kilometres in the north-east direction from Kozhikode. The college has a serene and extensive campus of about 67 acres, by the side of Kozhikode-Balussery Road, noted for its scenic beauty and blessed with the natural spring water fountain in the south-east location. The institution has been catering to the academic needs and aspirations of the pupils in and around Chelannur for more than four decades.

The foundation stone of the college building was laid in February1968 by Dr. T. Balakrishnan. The formal inauguration of the commencement of classes took place in June 1968 with Sri. R. Sankar, the Founder Secretary of the S.N. Trusts engaging the first Pre-Degree class. In 1975, with the beginning of under graduate courses in Botany and Commerce, the college was elevated to the status of a degree college. It became a venue for Post Graduate Studies with the commencement of M.Com degree course in 1995 and M A(English) Degree course in 1999. Recently in 2021 the 4th PG course M Sc Biology course with specialization Genetics, Biomechanics, Biomedicine, Genomics, and Green Biology was started. In March 2007, the college was accredited by the NAAC at the level of B+ grade and re- accredited by the NAAC at the level of B++ grade in October 2016.

At present the college is one of the prestigious institutions of higher learning run by S.N. Trusts, Kollam. It is managed by the executive committee of the S.N. Trusts with Sri. Vellappally Natesan as the manager. The Regional Development Committee, Calicut, assists the Trusts in the management and developmental activities of the college. The Principal is the Ex-officio member of the Regional Development Committee.

Our Motto

"Enlightenment through Education"

Our Vision

"Enlightenment and Liberation through Education"

Our Mission

To promote tolerance, secularism, communal harmony and democratic spirit among the youth. | To create morally responsible citizens. To expel the darkness of ignorance by lighting the lamp of wisdom.

Objectives

- To equip students with updated knowledge and relevant skills for improving their global competency.
- To promote higher education among the economically weak and socially backward sections of the society irrespective of caste and creed.
- To enhance the research aptitude of students and create a craving for academics
- To facilitate industry interactions.
- To develop knowledge and skills related to the subject of study.
- To instill the capacity to identify, formulate and handle scientifically complex problems, as well as to critically evaluate information and to formulate possible solutions.
- To develop skills to communicate knowledge at the theoretical as well as applied levels.
- To enhance the commitment of the faculty, staff, and students to the centrality of diversity, social justice and democratic citizenship
- To help students use their physical, mental and intellectual energies for the advancement of the individual and the society, to strive for the achievement of truth and righteousness.
- To enable teachers to integrate innovations with pedagogic discourse
- To encourage basic research and original thinking.
- To empower the marginalised and backward classes with special focus on women.
- To promote secularism, communal harmony and democratic spirit.

Figure 1 FRONT VIEW OF COLLEGE

ABOUT ENVIRONMENT AUDIT

The ICC defines Environmental Auditing as: **"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."**

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. Environmental conditions may be monitored from angles that are relevant to Indian requirements, without stress on legal issues or compliance. This innovative scheme is user friendly and totally voluntary. The environmental awareness helps the institution to set environmental examples for the community and to educate young learners.

Here we can mainly divide this report waste management initiatives and installations of systems such as bio gas plant, vermicompost, incinerator and collection and segregation of waste in the campus etc and students initiates in waste management as a social cause

GREEN PROTOCOL INITITIVES IN THE COLLEGE

Sree Narayana Guru College Chelannur follows a green protocol policy in the college by the management which is supported by administration, teachers and students and thus they are part of sustainable development of the college. Boards and indicatives and campaigns are conducted by the college. The steel glasses are using for serving tea/coffee. Water coolers are installed in the college for drinking water purpose. If any programmes re conducted the banners are of cloth type or digital type only. Stationary and papers are reused with different items by NSS club students and other wastes are treated in environment friendly way in the college itself.

WASTE MANAGEMENT

Waste is generally termed as 'a resource at the wrong place'. The college authorities are aware of the possible methods and have installed waste management measures like biogas systems. The waste clearance measures associated with different types of wastes are briefly given below. In this college normally three types of wastes are generated and we can divide the same as,

1. Bio degradable
2. Non bio degradable and
3. E-waste

1. BIODEGRADABLE WASTES

Biodegradable waste includes any organic matter in waste which can be broken down into carbon dioxide, water, methane or simple organic molecules by micro-organisms and other living things by composting, aerobic digestion, anaerobic digestion or similar processes also includes some inorganic materials which can be decomposed by bacteria. These materials are non-toxic to the environment and mainly include the natural substances like Plants and animals waste, even the dead plants and animals, fruits, paper, vegetables, etc. get convert into the simpler units, which further get into the soil and are used as manures, biogas, fertilizers, compost, etc.

The biodegradable wastes are mainly from the college canteen and pushed it to the Biogas plant. The bio-slurry is used as manure to the plantation.

I. BIO GAS PLANT

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. Biogas is a renewable energy source Biogas is produced by anaerobic digestion with methanogen or anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials. This closed system is called an anaerobic digester, bio digester or a bioreactor.

Biogas is a renewable, as well as a clean, source of energy. Gas generated through bio digestion is non-polluting; it actually reduces greenhouse emissions. No combustion takes place in the process, meaning there is zero emission of greenhouse gasses to the atmosphere; therefore, using gas from waste as a form of energy is actually a great way to combat global warming. Another biogas advantage is that, unlike other types of renewable energies, the process is natural, not requiring energy for the generation process. In addition, the raw materials used in the production of biogas are renewable.

Bio gas plant reduces soil and water pollution. Consequently, yet another advantage of biogas is that biogas generation may improve water quality. Moreover, anaerobic digestion deactivates pathogens and parasites; thus, it's also quite effective in reducing the incidence of waterborne diseases.

Bio gas generation produces organic fertiliser. The by-product of the biogas generation process is enriched organic (digest ate), which is a perfect supplement to, or substitute for, chemical fertilizers. The fertilizer discharge from the digester can accelerate plant growth and resilience to diseases, whereas commercial fertilizers contain chemicals that have toxic effects and can cause food poisoning, among other things.

Figure 2 PORTABLE FRP BIO GAS PLANT

The biogas plant converts food wastes into methane gas and usable bio fertilizers which will used for plants. The methane gas from the biogas plant is used in the canteen for cooking purpose and for heating drinking water hot water. Approximately 20 kg of LPG /month is saved by using biogas plant. The bio maneuver from the biogas plant is used for gardening, agriculture and for trees. This bio waste is also act as best bio insecticide and thus the college avoided the usage environmentally toxic precipices for environment. Here college is using floating FRP dome Type biogas plant of size 1 M^3 for treating bio waste. The slurry coming from the plant is collected in drums and reused after diluting with water for agriculture and for gardens. The methane gas is used in the canteen for hot water generation which is used for drinking and tea making.

II. VERMI-COMPOST

It is the product of the decomposition process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermin-cast. Vermicomposting contains water-soluble nutrients and is an excellent, nutrient-rich organic fertilizer and soil conditioner.[3] It is used in farming and small scale sustainable, organic farming.

The major source of raw material for vermi-compost is the leaves in the college campus and also the wastes generated which are not fed into biogas such as Chicken bones etc. The vermi-compost plants installed near to the scrap yard in the college campus

Figure 3 VERMICOMPOST UNIT

Benefits of Vermi-compost

a. For Soil

- Improves soil aeration
- Enriches soil with micro-organisms (adding enzymes such as phosphatase and cellulose)
- Microbial activity in worm castings is 10 to 20 times higher than in the soil and organic matter that the worm ingests
- Attracts deep-burrowing earthworms already present in the soil
- Improves water holding capacity

b. For Plant growth

- Enhances germination, plant growth, and crop yield.
- Improves root growth, Enriches soil with micro-organisms, adding plant hormones such as auxins and gibberellic acid.

c. For Economic

- Bio wastes conversion reduces waste dumping in landfills.
- Elimination of bio wastes from the waste stream reduces contamination of other recyclables collected in a single bin (a common problem in communities practicing is single-stream recycling)
- Creates low-skill jobs at local level.
- Low capital investment and relatively simple technologies make vermicomposting practical for less-developed agricultural regions.

d. For Environmental

- Helps to close the "metabolic gap" through recycling waste on-site.

- Large systems often use temperature control and mechanized harvesting, however other equipment is relatively simple and does not wear out quickly
- Production reduces greenhouse gas emissions such as methane and nitric oxide (produced in landfills or incinerators when not composted).

2. NON-BIODEGRADABLE WASTE

Materials that remain for a long time in the environment, without getting decompose by any natural agents, also causing harm to the environment are called non-biodegradable substances. These materials are metals, plastics, bottles, glass, poly bags, chemicals, batteries, etc. But as these are readily available, convenient to use, and are of low cost, the non-biodegradable substances are more often used. But instead of returning to the environment, they become solid waste which cannot be broken down and become hazardous to the health and the environment. Hence are regarded as toxic, pollution causing and are not considered as eco-friendly.

Many measures are taken these days, concerning the use of non-biodegradable materials. The **three 'R'** concept which says **Reduce-Recycle -Reuse** is in trend, which explains the use of the non-biodegradable materials. As we already discuss that these substances do not decompose, or dissolve easily so can be recycled and reuse. And one can help in reducing this waste by instead of throwing the plastics and poly bags in the garbage; it can be put in the recycling bags to use again.

Non-recyclable wastes are collected and burned once in a month using incinerator places inside the campus itself. The recyclable wastes are sorted out into categories and supplied it to the collecting units.

I. INCINERATOR

The objective of waste incineration, in common with most waste treatments, is to treat waste to reduce its volume and hazard, whilst capturing (and thus concentrating) or destroying potentially harmful substances. Incineration processes can also provide a means to enable recovery of the energy, mineral and/or chemical content from waste. Basically, waste incineration is the oxidation of the combustible materials contained in the waste. Waste is generally a highly heterogeneous material, consisting essentially of organic substances, minerals, metals and water. During incineration, flue-gases are created that will contain most of the available fuel energy as heat. The organic substances in the waste will burn when they have reached the necessary ignition temperature and come into contact with oxygen. The actual combustion process takes place in the gas phase in fractions of seconds and simultaneously releases energy. Where the calorific value of the waste and oxygen supply is enough, this can lead to a thermal chain reaction and self-supporting combustion, i.e. there is no need for the addition of other fuels.

The incinerator is used for incinerating non-biodegradable waste such as paper, plastic, sanitary napkins etc. The ash generated are as for manoeuvre after mixing with cow dung for plants. The ash generated from plastic will be treated separately.

The ash generated from canteen were wood is used as a fuel is used as manoeuvre for plants. The college campus promoting biodegradable packaging and reducing the consumption of plastic to a large extent.

Figure 4 SANITORY NAPKIN INCINERATOR

3. ELECTRONIC WASTE

Electronic waste or e-waste describes discarded electrical or electronic devices. E-waste or electronic waste is created when an electronic product is discarded after the end of its useful life. The rapid expansion of technology and the consumption driven society results in the creation of a very large amount of e-waste in every minute. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery, or disposal are also considered e-waste. Informal processing of e-waste in developing countries can lead to adverse human health effects and environment pollution. Certain components of some electronic products contain materials that render them hazardous, depending on their condition and density.

Recommendation

College has to sign an agreement for disposing the electronic wastes with a approved agency of Kerala State Pollution board for the same. For the time being it can be collected and stored in a fixed space near to common toilet and herbal garden area.

Hazardous waste Management in College

Chemical waste that is generated in the laboratories such as acids/ bases is neutralized before disposal. Alternative protocols are followed to bypass carcinogenic, cytotoxic and heavy metal-containing chemicals, heavy metal-containing chemicals are reduced, concentrated, solidified and disposed of as solid waste. Non-hazardous liquid chemical waste is then disposed of in sinks and hazardous liquid chemical waste is stored in separate glass containers and disposed of as hazardous waste

Suggestions for waste management

- Provide waste flow chart in the laboratory
- At present all the chemicals wastes are drained off into main drain.
- Do s and Don'ts in the laboratory while conducting experiments
- Standard disposal procedure in the laboratory for all chemicals used in the lab
- Separate bins and containers for control wastes and special control wastes, reusable items etc. in laboratory

FACILITIES PROVIDED BY COLLEGE FOR WASTE MANAGEMENT COLLECTION

- Toilets in every floor of all buildings separately for girls, boys and staff.
- There is separate toilet facility for department heads, staff rooms, administrative department and common facility.
- Certain toilets are facilitated for disable friendly with suitable hand rails and support mechanisms.
- Bins are provided in various areas of Campus for segregated collection of bio degradable (food,) and non-bio degradable wastes (Plastic, bottles)
- Separate team is maintained by college for maintain the clean campus, collection wastes from bins etc.

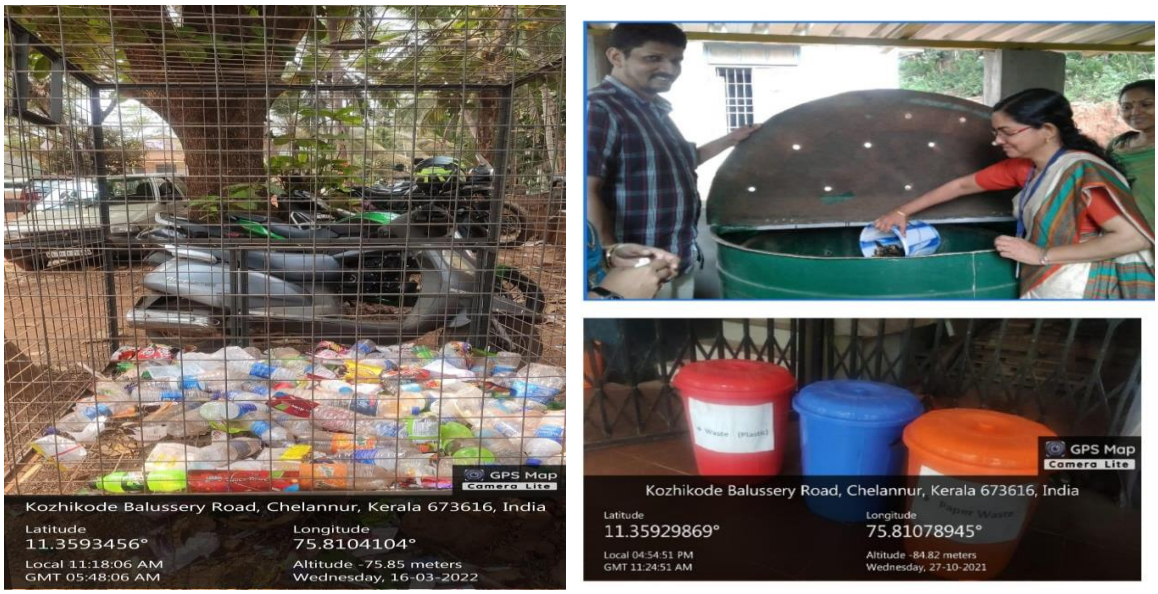

Figure 5: Plastic collection

The college already having understand with Chellannur Panjayath for collecting plastic wastes under GREEN PROTOCOL CARD , They collecting all segregated plastic on every week ;

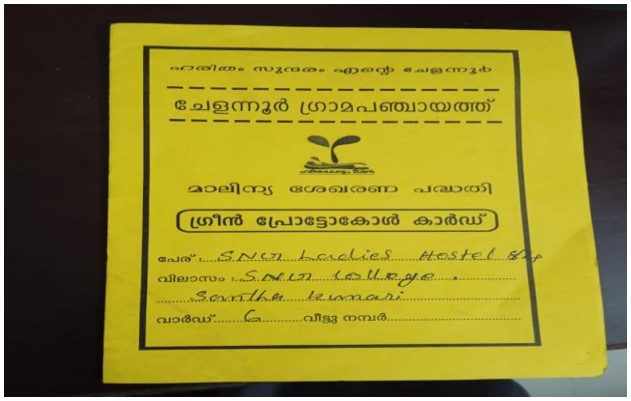

Figure 6 GREEN PROTOCOL CARD FROM PANJAYATH

STUDENT ACTIVITIES FOR ENVIRONMENTAL CONSERVATION

PLASTIC WASTE COLLECTION CHELANNUR TOWN

National Service Scheme volunteers of Sree Narayana Guru College, chelannur collectedplastic waste from Chelannur town and conducted awareness classes at auto taxi stand.

GANDHI JAYANTHI CELEBRATION

National service scheme volunteers of our college celebrated 'Gandhi Jayanthi' at villageoffice Kakkur. As part the programme volunteers cleaned the Kakkur town and village office in association with kakkur panchayat. The programme wind up after cleaning theRajive Gandhi Stadium at Kakku

CALICUT BEACH CLEANING

National Service Scheme volunteers of Sree Narayana Guru College Chelannur participated the Calicut Beach cleaning programme conducted by the leadership of District collector

CONCLUSION

Environment audit is the best way to analyse and solving the critical issues of waste management. Environment audit can add value to management approach being taken by college for identifying, collecting, segregating and processing of waste generated in the college campus. By analysing the waste generation in each segment such as biodegradable, non-degradable, R waste etc. gave an indication of waste generation and thus put control for the same to reduce the environmental impacts in due course.

The findings in the report shows that college perform fairly well in waste management issues and taken considerable efforts in a responsible manner. During audit and the conversations with the college team, we observed that Sree Narayana Guru College done various approaches in the past few years to performing well to sustainable environment. Even though there is space for further improvement that mentioned in the executive summary, the college is a good example for the minimisation of environment issues in the existing conditions.

ANNEXURE

- **BEE Accredited energy auditor certificate**

ENERGY IS LIFE
BEE
CONSERVE IT

BUREAU OF ENERGY EFFICIENCY

Examination Registration No.: EA- 7597

Accreditation Registration No.: AEA-0275

Certificate of Accreditation

This is to certify that Mr./Ms. Santhosh. A having its trade/registered office at Kerala has been given accreditation as accredited energy auditor. The certificate shall be effective from 2nd day of November, 2017

The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. 0275 in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this 12th day of February, 2018

Secretary,
Bureau of Energy Efficiency
New Delhi

➢ EnMs Certified Professional

Certificate of Attendance

intertek
Total Quality. Assured.

G KRISHNAKUMAR

has attended the following live virtual classroom course:

Transition training for Environment Management System as per ISO 14001:2015

Course is designed to explain:

- Requirements of ISO 14001:2015 in context of audit.
- Key changes from ISO 14001: 2004 to 14001:2015

Session Duration: 16 Hours

CERTIFICATE NUMBER
2020260507

TRAINING DATE:
25th & 26th May, 2020

Authorising Signature:

Intertek India Private Limited