

ENVIRONMENTAL AUDIT REPORT



SREE NARAYANA TRAINING COLLEGE
NEDUNGANDA, VARKALA

**Sree Narayana Training College Nedunganda,
Varkala, Thiruvananthapuram - 695307**

VYDYUTHITM
ENERGY SERVICES

**Indira Babu Energy Ventures Pvt Ltd
Thiruvathira, CP III 520
Nalanchira P.O, Thiruvananthapuram- 695015
Kerala, India**

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List of Acronyms

| Acronym | Description |
|---------|---|
| BEE | Bureau of Energy Efficiency |
| CO2 | Carbon Dioxide |
| dB | Decibel |
| HCHO | Formaldehyde |
| ICC | International Chambers of Commerce |
| NAAC | National Assessment and Accreditation Council |
| OC | Organic Carbon |
| Pb | Lead |
| pH | Potential of Hydrogen |
| PM | Particulate Matter |
| SDG | Sustainable Development Goals |
| TVOC | Total volatile organic compounds |
| UN | United Nations |
| VES | Vydyuthi Energy Services |
| WHO | World Health Organization |

1. ACKNOWLEDGEMENT

The world stands on the brink of an environmental crisis, the magnitude of which is unfathomable. We are living in that part of the history where entire human race has to come together and put in maximum efforts to rejuvenate the nature and safeguard our mother earth. Environmental auditing is one of the first steps for the same analyzing the current practices and bring in suitable improvements to perform in most sustainable way. We acknowledge and appreciate the responsibility taken and social commitment by Sree Narayana Training College Nedunganda, Varkala to initiate this environmental audit for the campus.

We, hereby express sincere thanks and gratitude to Smt. Dr. Sheeba P, Principal, Sree Narayan Training College Nedunganda, Varkala, Smt. Dr. Sangeetha. N.R. Coordinator, IQAC, and Smt. Dr. Viji. V, Assistant Professor for the initiative taken to conduct this audit and entrust Vydyuthi Energy Services for the said purpose. We thankfully acknowledge the whole hearted support extended for the entire audit process. Also, sincere thanks to and Smt. Dr. Dhanya B Chandran, Assistant Professor for their co-operation and the needful assistance, extended to us, during the conduct of the audit.

The Audit, data collection, data analysis and reporting were carried out by the following qualified and experienced energy auditors/professionals of Vydyuthi Energy Services.

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Managing Director
Vydyuthi Energy Services



2. DISCLAIMER

Vydyuthi Energy Services audit team has developed this report for Sree Narayana Training College, Nedunganda, Thiruvananthapuram based on the input data provided by the representatives of the institute with the best and careful judgement capacity of our expert team. The conclusions arrived are following the best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by the Audit team in this report or for any direct or consequential loss arising from any use of the information, statements, or forecasts in this report.

If you wish to distribute the copies of this report to any external organisations, then all pages must be included.

Vydyuthi Energy Services, its staff and agents shall keep all information as confidential with pertaining to the institute and shall not disclose any such information to any third party, except that in public domain or required by law or relevant accreditation bodies.

Data storage or the validity of the collected data on our digital archives from the institute maybe maintained for a period of 6 months and shall be deleted thereafter.

Report verified and approved by:



Anoop Babu, MIE, C.Eng. (India)
Independent Energy and Carbon Consultant
Advisory Board Member - CINEA - European Climate, Infrastructure and Environment
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3. EXECUTIVE SUMMARY

Environmental audit can be defined as evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions. As we are globally facing environmental crisis created due to urbanization and industrialization, it is necessary that every organization and individual understands the need for sustainable and eco-friendly living. In this context, green auditing and environmental audit has become a necessary criterion for academic institutions as per the grading system of National Assessment and Accreditation Council, New Delhi (NAAC). Moreover, educational organisations have the moral responsibility of promoting and practicing sustainable development measures and help in reducing environmental impact and its consequences.

Even though there are no set standards for educational institutions, experts from Vydyuthi Energy Services (VES) would help the institute in improvising the existing environmental criteria which are education for sustainability, climate action and biodiversity through building a process framework for establishing short, medium and long-term targets to be achieved in a long run. This environmental audit is carried out for Sree Narayana Training College, Nedunganda, Thiruvananthapuram campus during December 2021. The entire college campus has been audited to evaluate the environmental conditions and practices. The audit is carried out by qualified professionals and consultants with the support of Sree Narayana Training College, Nedunganda management and technical staffs. The audit process, analysis and reporting has been prepared based on the criteria mentioned above with important sections of various national and international standards, general guidelines, best practices and requirements for NAAC accreditation.

4. ABOUT VYDYUTHI ENERGY SERVICES

Vydyuthi Energy Services (VES) under Indira Babu Energy Ventures Pvt. Ltd, located in Kerala, India with services focused on energy sector. VES helps businesses and organizations across sectors to identify energy efficiency drivers and enable them to adopt viable action plans.

VES works with the vision of supporting the economy in achieving the Sustainable Development Goals (SDG) target by 2030. The important focus of the activities are to Enhance awareness, acceptability and applicability of energy efficiency and renewable energy technologies and provide energy services to build a sustainable future for generations to come. Other than energy auditing, VES offers consulting, training, project management services and R&D in the below areas for businesses in India and abroad

- Energy Efficiency
- Renewable Energy
- Power Quality assessment
- E-Mobility
- Carbon Accounting.
- Climate action



Vydyuthi Energy Services is:

- Empanelled as Energy Auditing Firm under Energy Management Centre Government of Kerala
- Recognised as signatory under UN Women Empowerment Program
- Partner of confederation of Indian Industries for training and consultancy in sustainability projects
- Recognized as start-up under Ministry of commerce and industries, Govt of India

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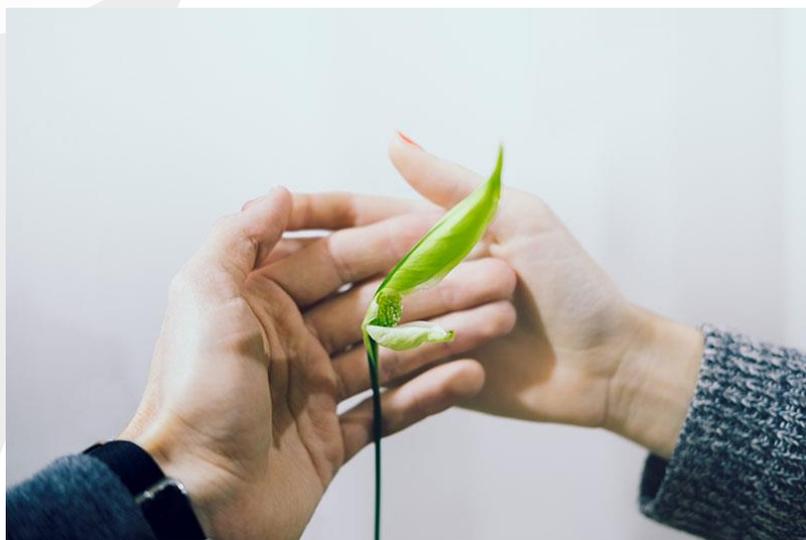
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5. CONTEXT

Environmental auditing can be viewed as an environmental management tool for measuring the effects of certain activities on the environment. As organisations nowadays recognises the importance of environmental issues and accept that their environmental performance will be scrutinised by a wide range of interested parties. The process aims at a study of present practices, policies and awareness about environmental factors and eco-friendly operation of the Sree Narayana Training College, Nedunganda, Thiruvananthapuram. It also provides recommendations for improvement of analysed data. These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organisation's environmental effects in a systematic and documented manner and will produce an environmental audit report. There are many reasons for undertaking an environmental audit, which include issues such as environmental legislation and pressure from customers.

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its core are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Environmental auditing is essentially the first steppingstone towards important sustainable development goals like good health and wellbeing, clean water and sanitation, sustainable communities, responsible consumption, climate action etc.



The term 'Environmental audit' or 'Green audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations/Institutions believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Green Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

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."

The outcome of Environmental audit and Green Audit should be established with concrete evidence that the measures undertaken and facilities in the institution under green auditing.

6. INSTITUTION CAMPUS

6.1. Overview

Sree Narayana Training College, Nedunganda is a pioneer educational institution in the field of Teacher Education. The college was established six decades ago in 1958 by Sri. R. Sankar in the name of the Great Visionary Spirit Sree Narayana Guru. The College is located at Nedunganda, a beautiful place near Varkala. The location is known for its serenity and calmness. The locality is hallmarked by the frequent presence of Sree Narayana Guru and Mahakavi Kumaranasan physically once and spiritually forever. The College is a well-established Teacher Education Institution contributing to the Society and Nation. It is affiliated to the University of Kerala and accredited by NAAC.

Sree Narayana Training College, Nedunganda campus is functioning in Thiruvananthapuram district of Kerala and is in a well-connected and accessible location.



Image 1: Sree Narayana Training College, Nedunganda, Thiruvananthapuram

6.2. Buildings and departments

Sree Narayana Training College, Nedunganda campus is designed for easy accessibility and movement of students, faculty members and other staffs from one department to another. Out of the 1.46 acres of total campus area, a built-in area is of 2589.51 Square meter which mainly consists of the following buildings:

- Main Block
- Office Block
- Golden Jubilee Block(UGC)

The campus has tarred roads and ways for vehicle and people access. The remaining area consists of natural flora and fauna along with preserved plants and lawns.



Image 2: Various buildings in Sree Narayana Training College, Nedunganda

The college has below mentioned major departments with well-equipped facilities to impart quality education according to the department specialties.

| | |
|------------------------|-------------------------|
| B .Ed. English | B .Ed. Malayalam |
| B .Ed. Mathematics | B .Ed. Physical Science |
| B .Ed. Natural Science | B .Ed. Social Science |

PROGRAMMES OFFERED BY THE COLLEGE AND NUMBER OF STUDENTS

| No. | Programme | 1 st year | 2 nd year |
|-----|-------------------------|----------------------|----------------------|
| 1 | B .Ed. English | 22 | 24 |
| 2 | B .Ed. Malayalam | 13 | 12 |
| 3 | B .Ed. Mathematics | 13 | 11 |
| 4 | B .Ed. Physical Science | 15 | 17 |
| 5 | B .Ed. Social Science | 19 | 16 |
| 6 | B .Ed. Natural Science | 18 | 17 |
| | GRAND TOTAL | 100 | 97 |

6.3. SN Training College, Nedunganda building.

The college building is located near the office block with proper road access. It is a multi-storage building with G +2 floors. The ground floor has class and conference hall. There is one fish tank located near office block. The first and second floors have classrooms, labs, staff rooms and library. Proper ventilation and natural lighting is available.



Image 3: College Building

6.4. Human Resource

The college imparts education and training to more than 100 students every academic year by offering B.Ed. courses in English, Malayalam, Mathematics, Physical Science, Natural Science and Social Science. The staff details of college are as below:

| Human resource | No. of Students | No. of Teachers | No. of Non-teaching staff |
|----------------|-----------------|-----------------|---------------------------|
| Gents | 13 | 5 | 4 |
| Ladies | 184 | 11 | 1 |
| Total | 197 | 16 | 5 |

7. SCOPE OF ENVIRONMENTAL AUDIT

7.1. Objectives

The audit is carried out to evaluate all major environmental parameters which are surveyed and documented covering the below aspects.

- Environmental awareness through systematic environmental management approach
- Overall environmental details of the campus and resources for further improvement of environmental such as air quality, wind, and sound assessment
- Evaluation of environmental protection initiatives
- Sustainable use of natural resources in the campus
- Financial savings through reduction in resource use
- Recommendation of ownership, personal and social responsibility for the institute and its environment
- Improvising institutes profile
- Test results of various environmental parameters
- Pros and cons of present practices and suitable recommendations

It is found that the management and campus are performing in near compliance with the environmental standards and best practices with potential improvements through a longer period. The report summarises the results of survey carried out with the help of management and staffs, direct inspections in campus, lab tests and on-site tests of various environmental parameters. Further details related to water, waste and energy management are included in the green audit report which is submitted separately. The overall results are satisfactory and the recommendations for further improvements are also provided based on expert analysis.

7.2. Improvement Areas

- Environment Policy such as ISO 14001 to be implemented by the institute.
- Storage of chemicals; like oils, acids etc. in designated place and safety warning to be displayed.
- Institute shall develop an internal inspection system for continuous monitoring of various environmental aspects in the campus.
- Development of Oxygen Park within the campus for improvising the air quality.
- Display of environment awareness posters in prominent areas of the campus.

8. INTRODUCTION TO ENVIRONMENTAL AUDIT

8.1. Benefits of environmental audit for an Educational Institution

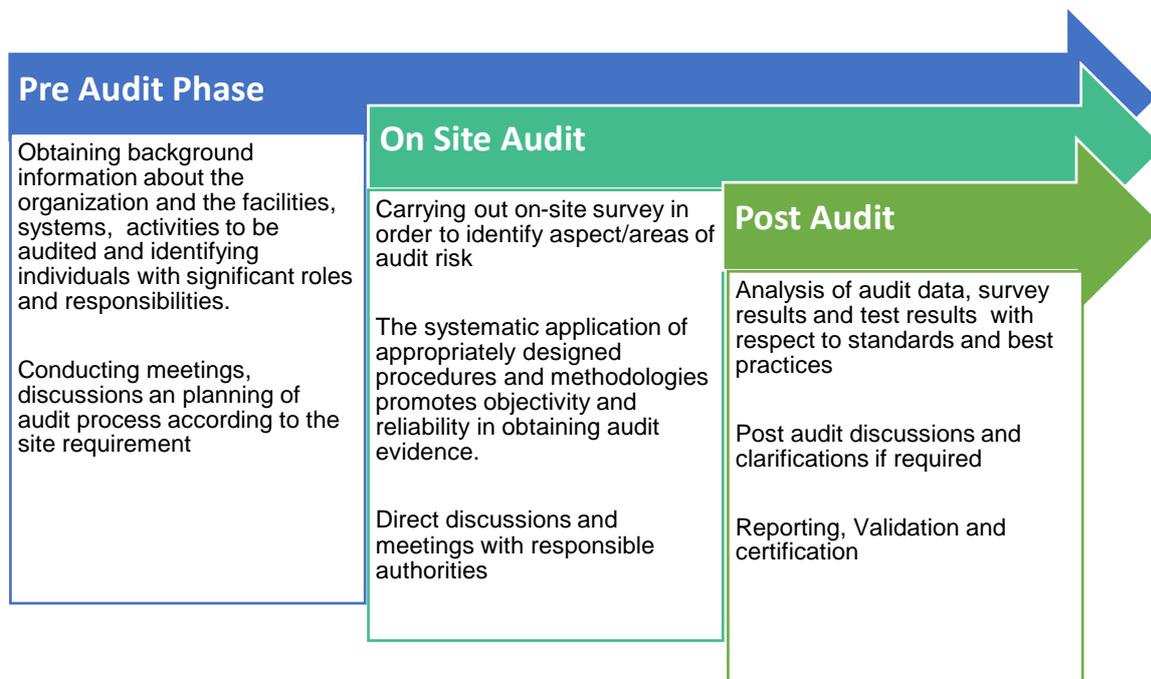
Environmental Audits play a significant role in sustainable development and overall health and productivity of the organisation. It keeps companies and organizations accountable by examining their practices and determining what measures need to be invested to ensure these groups are pertaining in meeting the environmental standards. The major activities for carrying out environmental audits are as below.

- Mapping institute policy on the environment and governance mechanism
- Identification of commercial savings along with environmental savings through natural resource conservation measures
- Measuring initiatives implemented for reducing air and water pollutions, promoting cycling, no vehicle days and public transport in premises.
- Awareness and engagement on environment management in premises with students, staffs and public.
- Area covered under plantation, biodiversity gardens, floral and faunal diversity, and estimation of carbon sequestrations by trees.
- Show the commitment of organisation towards environment and global sustainable development goals.



8.2. Methodology

The audit essentially assess if the institution is complying with the environmental policies in place. It examines the amount of harm or risk of injury that may be posed by the assessed entity and determines the types of pollution being produced by looking at a broad range of locations, activities, and procedures. The information compiled from these factors to determine what changes would need to be installed for compliance. The basic methodology for carrying out the audit is as shown below. Each step requires significant manpower and expertise to arrive at the final assessment report



9. ENVIRONMENT AND BIO-DIVERSITY

9.1. Topography and location

The Sree Narayana Training College campus is located at Nedunganda in Thiruvananthapuram, capital city of Kerala as shown in the below image. The elevation is 75 m (246.06 ft) and is located close to Arabian Sea at a distance of approximately 3 km. Hence the weather and topographical features are influenced by the same.

| | |
|-------------------------------|--|
| Location | Sree Narayana Training College, Thiruvananthapuram – 695587, Kerala, India |
| Co-ordinates | 8.697677575234083 E, 76.73840814208118 N |
| Total area | 1.46 Acres |
| Access | Easy road access |
| Nearest major Railway station | Varkala Sivagiri |
| Nearest Airport | Thiruvananthapuram International Airport |

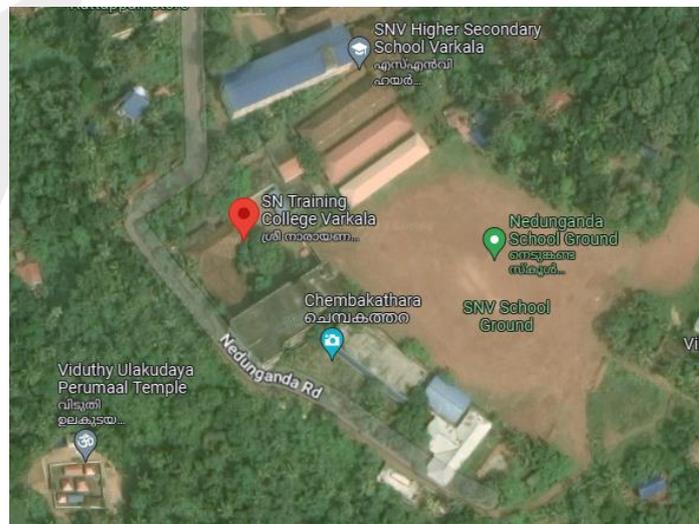
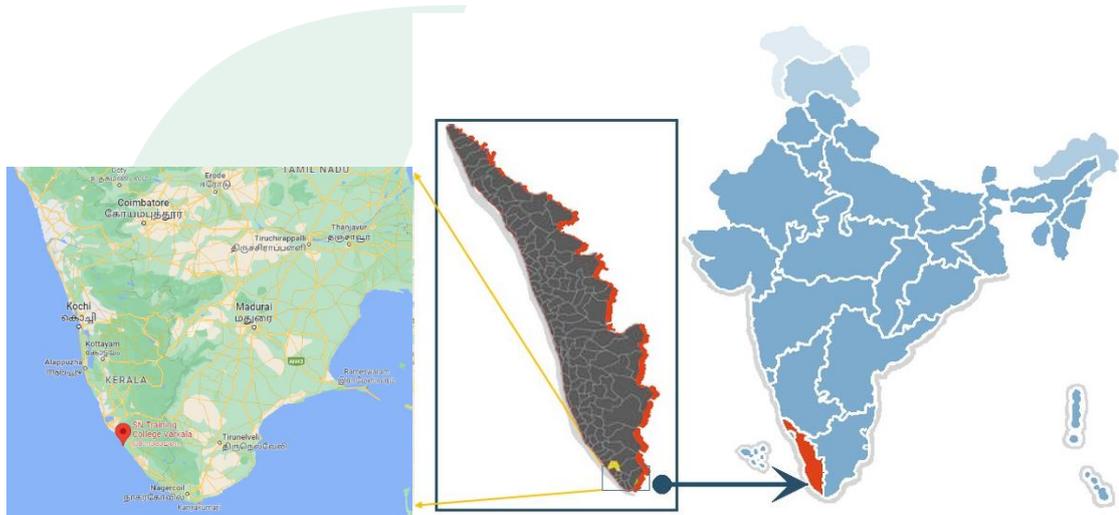


Image 3: Satellite view of Sree Narayana Training College, Nedunganda main campus blocks

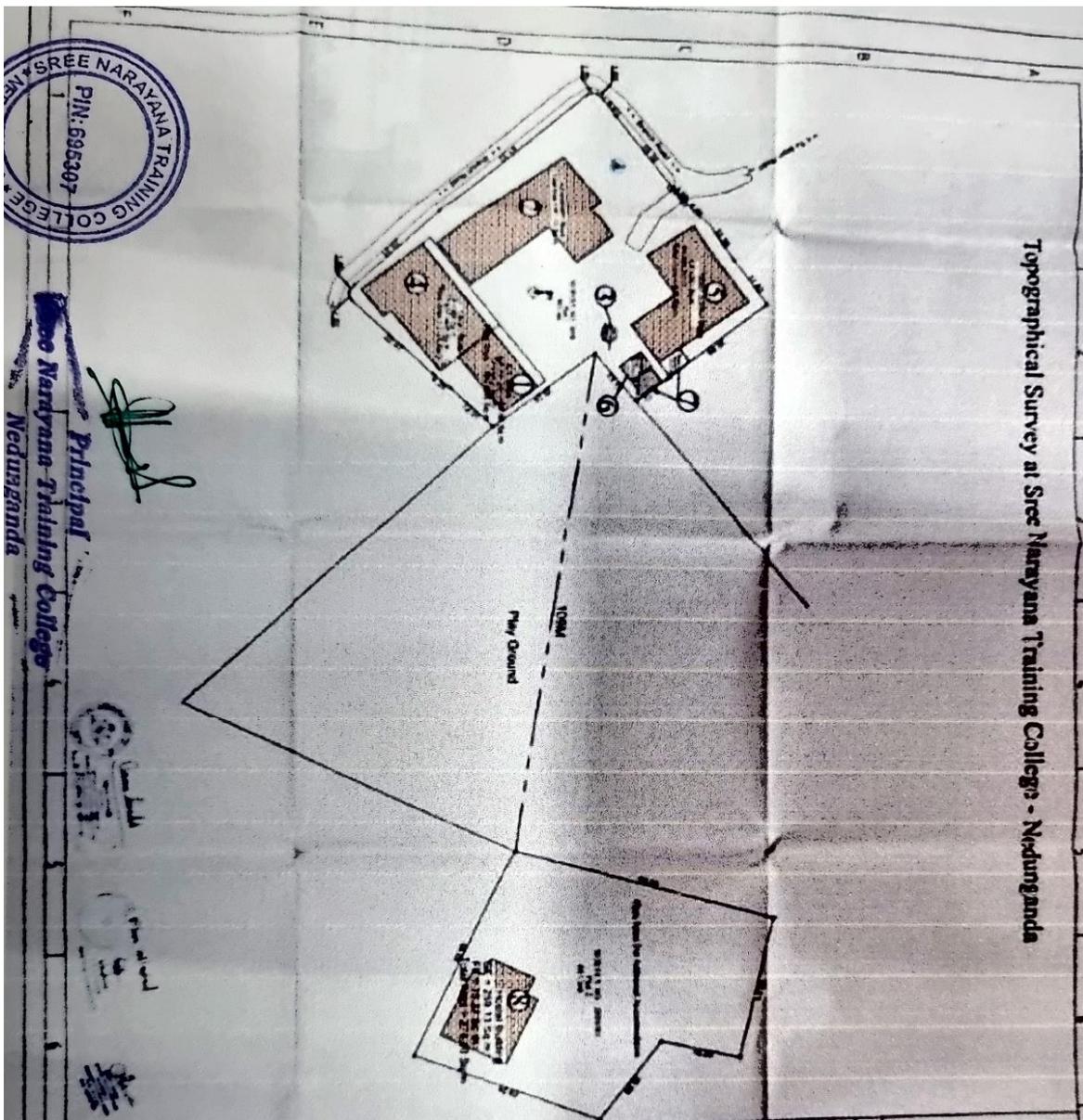


Image 4: Plot layout of Sree Narayana Training College, Nedunganda campus

9.2. Climatic data

The campus is located in Thiruvananthapuram district which has a climate that lies on the border between a tropical savanna climate (Köppen *Aw*) and a tropical monsoon climate (*Am*). As a result, its only distinct seasons relate to rainfall rather than temperature. The construction of buildings and the campus management is in accordance with the climate variation.

Temperature: Below image shows the average temperature variation throughout the year is shown in below image. The mean maximum temperature is 33.5 °C (92.3 °F) and the mean minimum temperature is 23.5 °C (74.3 °F)

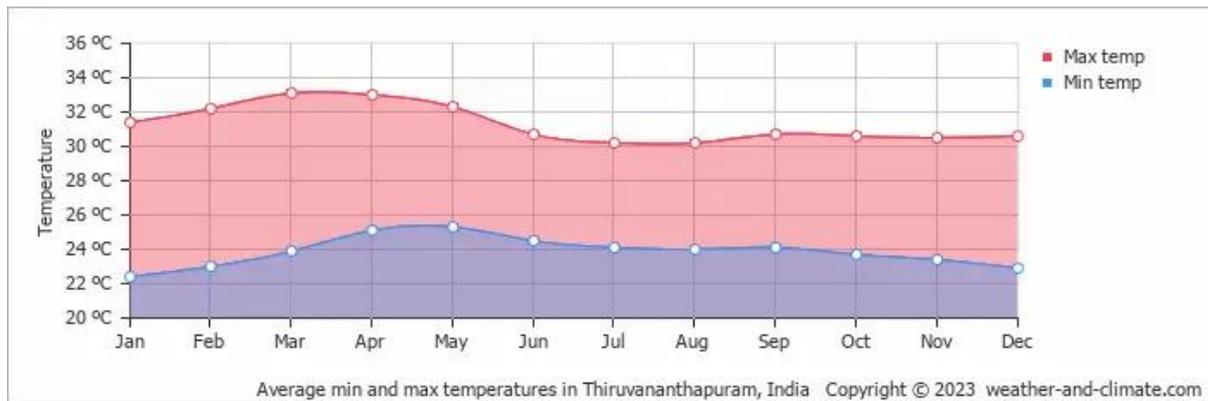


Image 5: Monthly average temperature variation

Rainfall: The location experiences extreme seasonal variation in monthly rainfall. Thiruvananthapuram is the first city along the path of the south-west monsoons and gets its first showers in early June.

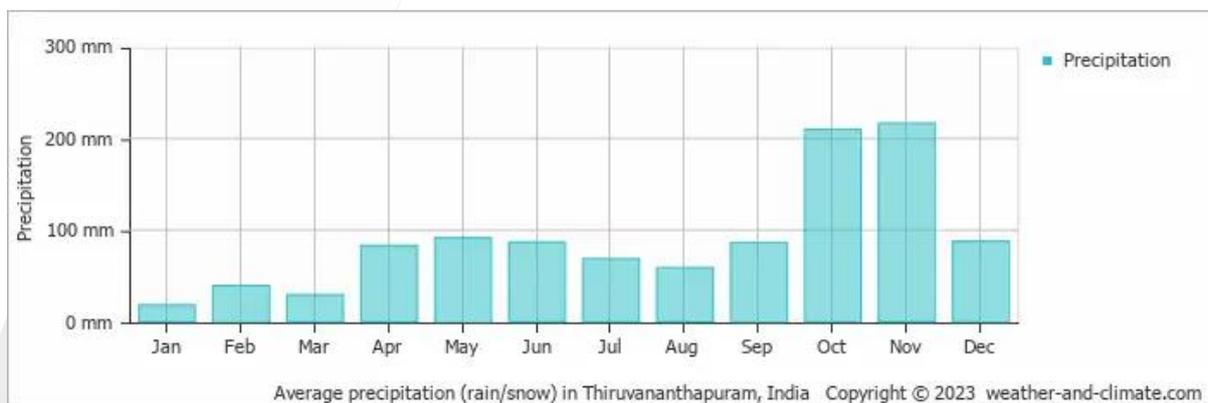


Image 6: Monthly average rainfall variation

Humidity: The humidity is high and rises to about 90% during the monsoon season. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body.

Precipitation: A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Thiruvananthapuram varies very significantly throughout the year.

Sun: The length of the day in the location does not vary substantially over the course of the year, staying within 37 minutes of 12 hours throughout. In 2021, the shortest day is December 21, with 11 hours, 38 minutes of daylight; the longest day is June 21, with 12 hours, 37 minutes of daylight. Below image shows the monthly sun hours throughout the year.



Image 7: Monthly Sun hour variation

Wind: The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. However, the monthly wind speed data is shown in below image

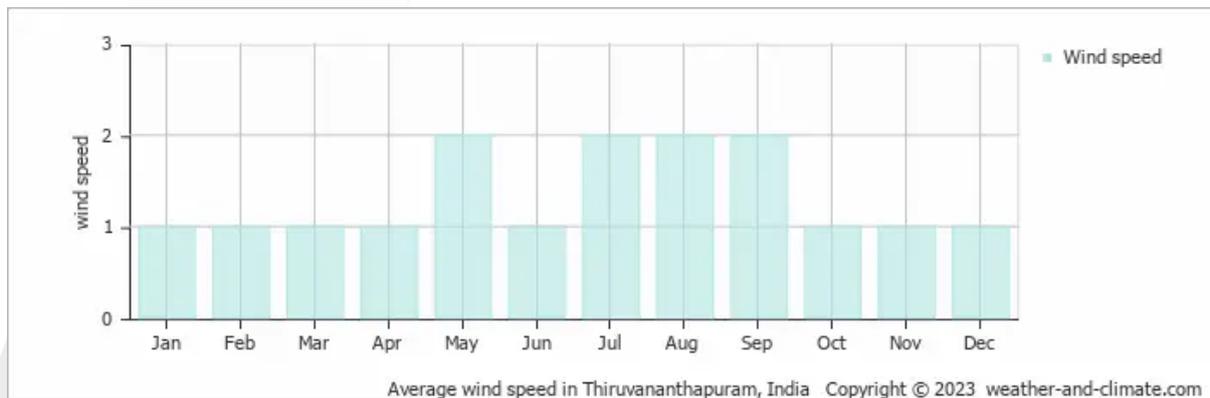


Image 8: Monthly wind speed variation

9.3. Flora and Fauna

The term flora relates to all plant life and the term fauna represents all animal life. Flora is classified and differentiated based on many factors. Flora and fauna are very important for human existence. The flora liberates oxygen that is consumed by the fauna for respiratory activities. Fauna, in turn, liberates carbon dioxide consumed by the flora for photosynthesis.

The flora and fauna spread across the earth contribute to the aesthetic value of the earth. Flora and Fauna contribute to the local economies through tourism. Besides all these, plants and trees are the only carbon sinks available on earth. Carbon sequestration by flora is very important in removing the greenhouse gases from atmosphere which is essential for fighting climate change and basic requirement for existence on life on earth.

A detailed survey is carried out in the institution campus to identify the varieties of plants and trees including natural vegetation, planted garden and preserved greenery. The details of flora are shown in the table along with approximate dimensions to study the carbon sequestration. The details are included under carbon accounting study in green audit report

The campus does not have any animal husbandry activities except for negligible number of stray animals.



Image 9: Varieties of flora in the campus

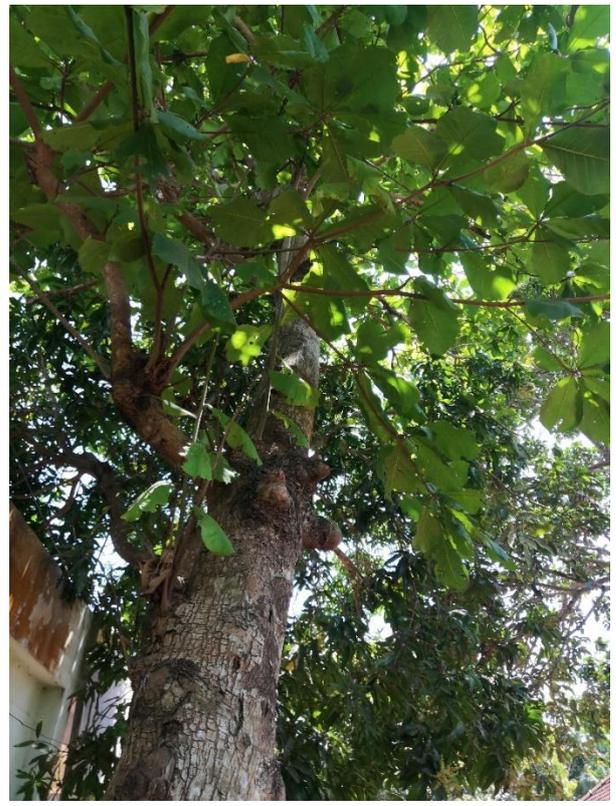


Image 10: Varieties of flora in the campus

Table 1: Carbon Sequestration

| Sl No. | Height in feet | Diameter in inches | Green weight above ground (kg) | Total Green Weight (kg) | Total Dry weight (kg) | Weight of Carbon (kg) | Weight of CO2 in kg | CO2 in kg/year |
|--------|----------------|--------------------|--------------------------------|-------------------------|-----------------------|-----------------------|---------------------|----------------|
| 1 | 16.4 | 5.02 | 61.88 | 74.25 | 53.83 | 26.92 | 44.75 | 0.90 |
| 2 | 16.4 | 5.02 | 61.88 | 74.25 | 53.83 | 26.92 | 44.75 | 0.90 |
| 3 | 29.52 | 10.03 | 445.51 | 534.62 | 387.60 | 193.80 | 322.23 | 6.44 |
| 4 | 29.52 | 10.03 | 445.51 | 534.62 | 387.60 | 193.80 | 322.23 | 6.44 |
| 5 | 26.24 | 7.52 | 222.76 | 267.31 | 193.80 | 96.90 | 161.12 | 3.22 |
| 6 | 22.96 | 7.52 | 194.91 | 233.89 | 169.57 | 84.79 | 140.98 | 2.82 |
| 7 | 22.96 | 12.54 | 541.42 | 649.71 | 471.04 | 235.52 | 391.60 | 7.83 |
| 8 | 22.96 | 11.91 | 488.63 | 586.36 | 425.11 | 212.56 | 353.42 | 7.07 |
| 9 | 22.96 | 8.78 | 265.30 | 318.36 | 230.81 | 115.40 | 191.89 | 3.84 |
| 10 | 22.96 | 9.40 | 304.55 | 365.46 | 264.96 | 132.48 | 220.28 | 4.41 |
| 11 | 16.4 | 10.03 | 247.51 | 297.01 | 215.33 | 107.67 | 179.02 | 3.58 |
| 12 | 26.24 | 20.06 | 1584.05 | 1900.86 | 1378.12 | 689.06 | 1145.72 | 22.91 |
| 13 | 29.52 | 11.91 | 628.24 | 753.89 | 546.57 | 273.29 | 454.40 | 9.09 |
| 14 | 22.96 | 9.40 | 304.55 | 365.46 | 264.96 | 132.48 | 220.28 | 4.41 |
| 15 | 26.24 | 15.05 | 891.03 | 1069.23 | 775.19 | 387.60 | 644.47 | 12.89 |
| 16 | 16.4 | 7.52 | 139.22 | 167.07 | 121.12 | 60.56 | 100.70 | 2.01 |
| 17 | 26.24 | 16.30 | 1045.72 | 1254.86 | 909.78 | 454.89 | 756.35 | 15.13 |
| 18 | 16.4 | 6.27 | 96.68 | 116.02 | 84.11 | 42.06 | 69.93 | 1.40 |
| 19 | 9.84 | 8.78 | 113.70 | 136.44 | 98.92 | 49.46 | 82.24 | 1.64 |
| 20 | 13.12 | 5.64 | 62.65 | 75.18 | 54.51 | 27.25 | 45.31 | 0.91 |
| 21 | 22.96 | 9.40 | 304.55 | 365.46 | 264.96 | 132.48 | 220.28 | 4.41 |
| 22 | 19.68 | 8.78 | 227.40 | 272.88 | 197.84 | 98.92 | 164.47 | 3.29 |
| 23 | 13.12 | 9.65 | 183.43 | 220.12 | 159.59 | 79.79 | 132.67 | 2.65 |
| 24 | 9.84 | 7.90 | 92.10 | 110.52 | 80.12 | 40.06 | 66.61 | 1.33 |

| | | | | | | | | |
|-------|-------|-------|---------|---------|--------|--------|--------|--------|
| 25 | 19.68 | 8.90 | 233.94 | 280.73 | 203.53 | 101.76 | 169.21 | 3.38 |
| 26 | 13.12 | 3.76 | 27.84 | 33.41 | 24.22 | 12.11 | 20.14 | 0.40 |
| 27 | 26.24 | 6.27 | 154.69 | 185.63 | 134.58 | 67.29 | 111.89 | 2.24 |
| 28 | 22.96 | 12.54 | 541.42 | 649.71 | 471.04 | 235.52 | 391.60 | 7.83 |
| 29 | 22.96 | 18.18 | 1138.34 | 1366.01 | 990.36 | 495.18 | 823.34 | 16.47 |
| 30 | 13.12 | 5.02 | 49.50 | 59.40 | 43.07 | 21.53 | 35.80 | 0.72 |
| 31 | 19.68 | 6.27 | 116.02 | 139.22 | 100.94 | 50.47 | 83.91 | 1.68 |
| Total | | | | | | | | 162.23 |

Table 2: Ornamental Plants

| SI No | Common Name | Scientific Name | No.of Plants |
|-------|-----------------------------|-----------------------------|--------------|
| 1 | Velvet Plant | Gynura Aurantiaca | 1 |
| 2 | Chinese evergreen | Agaltonema Jubilee petite | 1 |
| 3 | Balsam/Impatiens | Impatiens walleriana | 1 |
| 4 | Petra Croton | Codiaeum variegatum | 1 |
| 5 | Bridal Bouquet | Plumeria pudica | 1 |
| 6 | Paper Flower | Bougainvillea glabera | 2 |
| 7 | Red dirt ramblings | Coleus Solenostemon | 2 |
| 8 | Arrow head vine | Syngonium podophyllum | 1 |
| 9 | Money Plant | Epipremnium aurem | 57 |
| 10 | Needle Stonecrop | Sedum lineare | 16 |
| 11 | Ti plant | Cordyline fruticosa | 3 |
| 12 | Bangkok rose | Mussaenda erythrophylla | 2 |
| 13 | Devils backbone | Pedilanthus Tithymaloides | 1 |
| 14 | Princess tree | Royal paulownia | 1 |
| 15 | Crown of thorns | Euphorbia mili | 5 |
| 16 | Caricature plant | Graptophyllum pictum | 1 |
| 17 | Butter Cup | Turnera Subulata | 5 |
| 18 | Fairy castle cactus | Acanthocereus tetragonus | 3 |
| 19 | Flame Violet | Episcia cupreata | 1 |
| 20 | Snake plant | Dracaena trifasciata | 2 |
| 21 | Spider Plant | Cholorophytum cosmosum | 1 |
| 22 | Wandering Jew | Tradescantia Zebrina | 19 |
| 23 | Purple Heart | Tradescantia Palliada | 2 |
| 24 | Brazilian Jasmine | Mandevilla Sanderi | 2 |
| 25 | Ming Aralia | Polyscias fruticose | 1 |
| 26 | Philodendron | Philodendron burle Marxii | 8 |
| 27 | Crown of Thorns | Euphorbia mili | 11 |
| 28 | Snake plant | Laurentii Sansevieria | 5 |
| 29 | Ribbon Plant | Chlorophytum comosum | 1 |
| 30 | Chinese evergreen | Aglonema commutatum | 2 |
| 31 | Rain lilly | Zephyranthus rosea | 2 |
| 32 | YellowTrumpetbush | Tecoma Stans | 3 |
| 33 | Pink Morning Glory | Ipomea Carnea | 1 |
| 34 | Bryophyllum | Bryophyllum Pinnatum | 11 |
| 35 | Buttercup | Turnera Subulata | 3 |
| 36 | Coleus | Coleus Scutellariodies | 6 |
| 37 | Star Jasmine | Trachelospermum Jasminoides | 2 |
| 38 | Orchid Tree, Mountain Ebony | Bauhinia Variegata | 3 |
| 39 | Malang-Malang | Calophyllum Soulattri | 1 |

| | | | |
|----|--|-----------------------------|---|
| 40 | Spiral Flag | Chamacastus Cuspidatus | 1 |
| 41 | Dracena | Dracena Varigata | 8 |
| 42 | Croton Plant | Codiaeum Variegatum | 1 |
| 43 | Eugenia Plant/Christina Tree | Syzygium Campanulatum | 4 |
| 44 | Green Bush/Phyllathus Bush | Phyllanthus Bourgoisie Bail | 2 |
| 45 | Syngonium/Arrowhead plant | Syngonium Podophyllum | 1 |
| 46 | ZZ Plant | Zamioculus Zamiifolia | 1 |
| 47 | Song of India | Dracaena reflexa | 1 |
| 48 | Cornstalk Dracaena/ Striped Dracaena | Dracaena Fragrans | 2 |
| 49 | Golden can palm/ Areca Palm/ Butterfly Palm/ Bamboo Palm | Dypsis Lutescens | 2 |
| 50 | Narrow leaf araucaria | Araucaria Subulata | 2 |
| 51 | Bush Juniper | Juniperus recta | 2 |
| 52 | Dwarf White Orchid tree/ Snowy Orchid tree | Bauhinia Acuminata | 1 |
| 53 | Fishbone cactus/ Zig zag cactus | Selenicereus Anthonyanus | 1 |
| 54 | Jasmine | Jasminium Sambac | 2 |
| 55 | Paperflower/ Bougainville | Bougainvillea Spectabilis | 1 |
| 56 | Fairy castle cactus | Acanthocereus tetragonus | 1 |
| 57 | Golden Trumpet/ Yellow Allamanda | Allamanda Cathartica | 1 |
| 58 | Coastal She-oak/ Horsetail She-Oak | Casuarina equisetifolia | 1 |

Table 3: Medicinal Plants

| Sl no | Common Name | Scientific Name | No.of Plants |
|-------|----------------------|---------------------------|--------------|
| 1 | Morning-glory | Clitoria ternatea | 2 |
| 2 | Sarvasugandhi | Pimenta diocia | 1 |
| 3 | Curry tree | Murraya Koenigii | 6 |
| 4 | Holy Basil | Ocimum Sanctum | 16 |
| 5 | Kumbil | Gmelina arborea | 2 |
| 6 | Jackfruit tree | Artocarpus heterophyllus | 2 |
| 7 | Balloon vine | Cardiospermum halicacabum | 18 |
| 8 | Cashew tree | Anacardium occidentale | 1 |
| 9 | Indian Bael | Aegle marmelos | 1 |
| 10 | Neem | Azadirachta indica | 1 |
| 11 | River tamarind | Leucaena leucocephala | 1 |
| 12 | Chinese Parasol tree | Firmiana simplex | 1 |
| 13 | Adinandra | Adinandra acuminata | 1 |
| 14 | Amur cork tree | Phellodendronamurensense | 1 |
| 15 | Tulsi | Ocimum Tenuiflorum | 1 |
| 16 | Sandalwood | Santalum Album | 2 |
| 17 | MangoTree | Maginfera Indica | 1 |
| 18 | Drumstick Tree | Moringa Oleifera | 2 |
| 19 | Goden shower | Cassia Fistula | 2 |
| 20 | Indian Almond | Terminalia Catappa | 4 |
| 21 | Karra | Cleistanthus Collinus | 1 |
| 22 | Indan Mulberry | Morinda tinctoria | 3 |
| 23 | Mysore fig | Ficus drupacea | 1 |
| 24 | Country Cinnamon | Cinnamomum Malabatum | 1 |
| 25 | Emblica | Phyllanthus Emblica | 6 |
| 26 | Guabiyu | Myrcianthes Pungens | 1 |

| | | | |
|----|----------------------|-----------------------|----|
| 27 | Mexican Mint | Coleus ambonicus | 1 |
| 28 | Sita ashok | Saraca asoca | 1 |
| 29 | Ixora | Ixora Coccinea | 2 |
| 30 | Dwarf aquariumlilly | Nympheanouchali | 5 |
| 31 | Creeping Woodsorrell | Oxalis Cornicuata | 15 |
| 32 | Weeping Ficus | Ficus Benjamina | 1 |
| 33 | Java Plum | Syzgiu cumini | 1 |
| 34 | Bright Eyes | Catharanthus roseus | 4 |
| 35 | Neem | Azadirachata Indicac | 1 |
| 36 | Guava | Psidium Huajava | 1 |
| 37 | Devils Backbone | Euphorbia Titymaloide | 1 |
| 38 | IndianGooseberry | Phyllanthus Emblica | 1 |



Image 11: Varieties of flora in the campus



Image 12: Medicinal Plants at campus

10. BASIC AUDIT DATA

| | | | |
|--|-----------------|-----------------|---------------------------|
| What is the total strength of students and teachers in your college? | | | 197 |
| | No. of Students | No. of Teachers | No. of Non-teaching staff |
| Gents | 13 | 5 | 4 |
| Ladies | 184 | 11 | 1 |
| Total | 197 | 16 | 5 |

| Sl.no. | Questions | Response |
|--------|--|---|
| 1 | Is there a garden in your college area? | Yes |
| 2 | Do students spend time in the garden? | Yes |
| 3 | List the plants in the garden, with approx. numbers of each species. | Refer section 9.3 |
| 4 | Suggest plants for your campus. (Trees, vegetables, herbs, etc.) | Trees, vegetables, herbs etc. |
| 5 | List the species planted by the students, with numbers. | |
| 6 | Whether you have displayed scientific names of the trees in the campus? | Yes |
| 7 | Are there any plantations in your campus? If yes specify area and type of plantation. | No |
| 8 | Is there any vegetable garden in your college? If yes how much area? | No |
| 9 | Is there any medicinal garden in your college? If yes how much area? | Yes, |
| 10 | What are the vegetables cultivated in your vegetable garden? (Mention the quantity of harvest in each season) | Not applicable |
| 11 | How much water is used in the vegetable garden and other gardens? Mention the source and quantity of water used. | Source: water from rain water harvesting |
| 12 | Who is in charge of gardens in your college? | NSS |
| 13 | Whether you are using any type of recycled water in your garden? | Nil |
| 14 | List the name and quantity of pesticides and fertilizers used in your gardens? | Nil |
| 15 | Whether you are doing any organic farming in your college? How? | Nil |
| 16 | Do you have any composting pit in your college? If yes What are you doing with the compost generated? | No |
| 17 | What are you doing with the vegetables harvested? Do you have any student market? | Nil |
| 18 | Is there any botanical garden in your campus? If yes give the details of campus flora. | Yes. Medicinal garden |
| 19 | Name number and names of the medicinal plants in your college campus. | Details attached |
| 20 | Any threatened plant species planted/conserved. | |
| 21 | Is there a nature club in your college? If yes what are their activities? | Yes, Soil conservation, Maintenance of medicinal garden, awareness sessions against plastic pollution etc |

| | | |
|----|---|--|
| 22 | Is there any arboretum in your college? If yes details of the trees planted. | Yes, Medicinal Garden |
| 23 | Are there any fruit yielding plants in your college? If yes details of the trees planted. | Yes, Guava, Jack fruit tree etc |
| 24 | Are there any groves in your college? If yes details of the trees planted. | No |
| 25 | Is there any irrigation system in your college? | No |
| 26 | What is the type of vegetation in the surrounding area of the college? | Refer section 9.3 |
| 27 | What is the nature awareness programmes conducted in the campus? | Hands on training through nature club |
| 28 | What is the involvement of students in the green cover maintenance? | Students participate in garden maintenance |
| 29 | What is the total area of the campus under tree cover? Or under tree canopy? | |
| 30 | Share your IDEAS for further improvement of green cover. | Introduction of ornamental decorative plants like orchid, anthurium, araucaria, golden palm, fox tail palm etc |

11. TEST RESULTS AND ANALYSIS

11.1. Air quality analysis

Air quality is an important environmental parameter for any establishment including home, office and service organisations. The quality of the air that you breathe can impact not only your family or your employee’s health but it can also effect productivity as well. Air that is trapped inside a building, especially for a college campus can contain formaldehyde, fire retardants, radon, and even the chemicals from conventional cleaners. Indoor air pollution is the degradation of indoor air quality by harmful chemicals and other materials and it is considered to be 10 times more severe than the outdoor air pollution. Poor indoor air quality is the second largest killer with 1.3 million deaths in India each year. For a college campus, outdoor air quality is also important in determining the environment.

AIR QUALITY IMPACTS

| Personal Comfort | Health | Cleanliness |
|---|---|---|
| <ul style="list-style-type: none"> Elevated pollution levels can cause discomforts including headaches and irritation Some individuals, particularly children, have greater sensitivity | <ul style="list-style-type: none"> Some pollutants are carcinogens and also cause severe health problems (e.g., formaldehyde) Some pollutants are irritants at normal levels (e.g. toluene) | <ul style="list-style-type: none"> Bad odors and stale air can be perceived as a lack of cleanliness and can make people feel uncomfortable People can lose the ability to perceive scents if frequently exposed to odors |

In this environmental audit, the air quality is analysed using suitable air quality analyser for all major indoor and outdoor locations in the campus where the levels of HCHO, TVOC and PM 2.5&10 were verified. Instrument used: SMILEDRIIVE Portable Air Quality Pollution Meter. The significance of the major components analysed are as below

Formaldehyde (HCHO)

Formaldehyde is a colourless, flammable, strong-smelling chemical that is used in building materials and to produce many household products. Formaldehyde is found in the environment, because it is formed primarily by numerous natural sources and anthropogenic activities. Anthropogenic sources include direct ones such as on-site industrial emissions and fuel combustion from traffic. Other combustion processes also represent sources of formaldehyde emissions in the atmosphere. When formaldehyde is present in the air at levels exceeding 0.1 ppm, it is considered to be harmful. Some individuals may experience adverse effects such as watery eyes; burning sensations in the eyes, nose, and throat; coughing; wheezing; nausea; and skin irritation.

Total volatile organic compounds (TVOC)

TVOC represent the entire pool of pollutants with volatile organic materials. Many standards include different VOCs in their TVOC grouping, or assign different weights when calculating TVOC. TVOC is an Indicator for Indoor Air Quality especially in an organisation like colleges where there are plenty of organic materials in use. In addition to serious health concerns, there is the psychological aspect: homes, offices, and other environments that smell clean typically seem more welcoming than areas with foul odours caused by organic compounds.

Particulate matter (PM) – PM 2.5/ PM 10

Particulate matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. It is a complex mixture of solids and aerosols composed and vary widely in size, shape and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, and compounds from the earth's crust. Particles are defined by their diameter for air quality regulatory purposes. PM10 (diameter of 10 microns) and PM2.5 (2.5 microns or less in diameter) are inhalable into the lungs and can induce adverse health effects. Emissions from combustion of gasoline, oil, diesel fuel or wood, dust from construction sites, landfills and agriculture, brush/waste burning, industrial sources, wind-blown dust, pollen and fragments of bacteria constitute PM 2.5 and PM 10.

Below table shows the results of air quality analysis carried out at various locations within the campus.

Table 4: Results of air quality analysis

| Sl no | HCHO in mg/m3 | TVOC in mg/m3 | PM2.5 | PM 10 | Overall Level |
|-----------------------------------|---------------|---------------|-------|-------|---------------|
| Office Block | | | | | |
| 1 | 0.008 | 0.003 | 25 | 29 | fresh |
| 2 | 0.006 | 0.003 | 23 | 26 | fresh |
| 3 | 0.006 | 0.003 | 14 | 16 | fresh |
| 4 | 0.006 | 0.003 | 15 | 17 | fresh |
| 5 | 0.007 | 0.002 | 17 | 19 | fresh |
| 6 | 0.006 | 0.001 | 15 | 17 | fresh |
| 7 | 0.007 | 0.002 | 18 | 20 | fresh |
| Main Block | | | | | |
| 8 | 0.006 | 0.003 | 15 | 17 | fresh |
| 9 | 0.005 | 0.003 | 15 | 17 | fresh |
| 10 | 0.001 | 0.003 | 16 | 18 | fresh |
| 11 | 0.004 | 0.001 | 19 | 22 | fresh |
| 12 | 0.006 | 0.006 | 27 | 31 | fresh |
| 13 | 0.007 | 0.004 | 24 | 27 | fresh |
| 14 | 0.006 | 0.003 | 25 | 27 | fresh |
| 15 | 0.006 | 0 | 23 | 26 | fresh |
| 16 | 0.006 | 0.001 | 23 | 26 | fresh |
| 17 | 0.004 | 0.003 | 19 | 22 | fresh |
| 18 | 0.008 | 0 | 16 | 18 | fresh |
| 19 | 0.007 | 0.002 | 18 | 20 | fresh |
| 20 | 0.005 | 0.003 | 16 | 18 | fresh |
| Golden Jubilee Block (UGC) | | | | | |
| 21 | 0.007 | 0.001 | 19 | 22 | fresh |
| 22 | 0.005 | 0.003 | 20 | 23 | fresh |
| 23 | 0.006 | 0.002 | 17 | 19 | fresh |

The results are satisfactory considering the amount of significant pollutants. The indoor and outdoor air is fresh and according to environmental standards.





11.2. Soil test

Soil test is carried out to analyse the important components in the soil which affects the level of nutrients, salts, fertilizers and other harmful substances. Soil analysis provides an overview of the natural habitat, environmental practices, waste management, health effects and need for improvement. As a part of this environmental audit, the below parameters are analysed and results are shown in the image.

Soil pH

Soil pH is a measure of the acidity or alkalinity of the soil. pH affects the amount of nutrients and chemicals that are soluble in soil water, and therefore the amount of nutrients available to plants. However, most mineral nutrients are readily available to plants when soil. The correct balance is where the soil pH is between 5.5 and 7.5. Early identification of soil pH problems is important as it can be both costly and difficult to correct long-term nutrient deficiencies. pH is near neutral and the results are satisfactory.

Salinity

Excess soil salinity causes poor and spotty stands of crops, uneven and stunted growth and poor yields, the extent depending on the degree of salinity. The soil analysis of sample shows to be non-saline in nature.

Organic carbon:

Soil organic carbon is a measurable component of soil organic matter. Organic matter makes up just 2–10% of most soil's mass and has an important role in the physical, chemical and biological function of agricultural soils. Organic matter contributes to nutrient retention and turnover, soil structure, moisture retention and availability, degradation of pollutants, and carbon sequestration. The test results shows good about of organic matter which is satisfactory. Changes in stable SOC generally occur very slowly (over decades), and it is often hard to measure small changes against a relatively large background of soil carbon. Changes in SOC are largely determined by how much biomass is grown and retained above and below ground.

Phosphorous Content:

Phosphorus (P), next to nitrogen, is often the most limiting nutrient for crop and forage production. Phosphorus' primary role in a plant is to store and transfer energy produced by photosynthesis for use in growth and reproductive processes. Soil P cycles in a variety forms in the soil. Adequate P levels promote root growth and winter hardiness, stimulate tillering, and hasten maturity. Phosphate soil test levels are an excellent indicator of P-cycling in soils, and are an index of the likelihood of crop response to P fertilizer.

Potassium content:

Potassium is another important nutrient for increasing crop yield and enriching soil. Forms of potassium that are accessible to plants from soil are exchangeable potassium and soil solution potassium. SOM present in surface layer is a crucial factor that retains sufficient quantity of potassium. Potassium has many and varied functions in plant life, as a constituent of enzymes and as a regulator of drought tolerance and water-use efficiency

ലാബ് നമ്പർ: 272 മണ്ണ് പരിശോധനാഫലം പരിശോധന തീയതി:

| Soil Texture (മണ്ണിന്റെ ഇനം) | Estimations (പരിശോധനകൾ) | P. H. (പി. എച്ച്.) മണ്ണിന്റെ ആഴക്കാര സ്വഭാവത്തിന്റെ അളവ് | T.S.S. EC in mhos/cm ലയിച്ചു ചേർന്നിട്ടുള്ള ലവണങ്ങളുടെ അളവ് | ലഭ്യമായ തിരിച്ചിലുള്ള പ്രധാന പോഷകമൂലകങ്ങൾ | | | മറ്റു മൂലകങ്ങൾ | | യൂണിറ്റ് |
|----------------------------------|-------------------------|--|---|---|----------------------|------------------------|-----------------|----------------|----------|
| | | | | Org. Carbon (%) നൈട്രജന്റെ മൂല മാനദണ്ഡം | P (kg./ha.) ഫോസ്ഫറസ് | K (kg./ha.) പൊട്ടാസ്യം | കാത്സ്യം (Ca) | മഗ്നീഷ്യം (Mg) | |
| Sandy മണൽ (പദാശം) | Value അളവ് | 5.1 | 0.1 | 0.91 | 43 | 448 | സൾഫർ (S) | 5.0 | S |
| Loamy (ചെമ്മണ്ണ്/പശിമടാരി മണ്ണ്) | Rating* തോത് | അളവ് | ക്രമം | കുറവ് | കുറവ് | കുറവ് | ഇരുമ്പ് (Fe) | 25.3 | S |
| Clayey (പശയുള്ള കളിമണ്ണ്) | | മധ്യം | അധികം | മധ്യം | മധ്യം | മധ്യം | സിങ്ക് (Zn) | 5.9 | S |
| മുറ്റിനങ്ങൾ | | കുറവ് | കുറവ് | കുറവ് | കുറവ് | കുറവ് | കോപ്പർ (Cu) | 1.6 | S |
| Class No. | | 4 | 0 | 4 | 9 | 9 | മാഗ്നീസ്യം (Mn) | 16.3 | S |
| | | | | | | | ബോറോൺ (B) | 0.71 | S |

*അനുയോജ്യമായ കോളങ്ങളിൽ ടിക് (✓) അടയാളം ഇട്ടിരിക്കുന്നു. S - Sufficient

| ക്രമ നമ്പർ | വിളകൾ | നൈട്രജൻ N g | ഫോസ്ഫറസ് P ₂ O ₅ g | പൊട്ടാസ്യം K ₂ O g | മഗ്നീഷ്യം Mg | കാത്സ്യം Ca | സൾഫർ S | ഇരുമ്പ് Fe | സിങ്ക് Zn | മാഗ്നീസ്യം Mn | കോപ്പർ Cu | ബോറോൺ B |
|------------|-------|-------------|--|-------------------------------|--------------|-------------|--------|------------|-----------|---------------|-----------|---------|
| | നെൽ | 309 | 43 | 170 | | | | | | | | |

| ക്രമ നമ്പർ | വിളകൾ | യൂറിയ Urea g | രാജ്ഫോസ്/റോക്ക് ഫോസ്ഫേറ്റ് Rajphos/Rockphosphate g | മ്യൂറോപ്പ് ഓഫ് പൊട്ടാഷ് MOP g | മഗ്നീഷ്യം സൾഫേറ്റ് Magnesium Sulphate g | ചാരം Ash | കുരുമുളക് Lime Kg | ഓർഗാനിക് മാനൂർ Organic Manure Kg | സൂക്ഷ്മ മൂലകങ്ങൾ Micronutrients | മറ്റ് നിർദ്ദേശങ്ങൾ Others | അളവ് Unit |
|------------|-------|--------------|--|-------------------------------|---|----------|-------------------|----------------------------------|---------------------------------|---------------------------|-----------|
| | നെൽ | 613 | 213 | 283 | 500 | - | 2.02 | 25 | - | - | 1000kg |

തീയതി: അസിസ്റ്റന്റ് സോയിൽ കെമിസ്റ്റ്, തിരുവനന്തപുരം - 695 015

Image 11: Test report from District Soil Testing Laboratory, Thiruvananthapuram (site: near Office Block)

ലാബ് നമ്പർ: 271 മണ്ണ് പരിശോധനാഫലം പരിശോധന തീയതി:

| Soil Texture (മണ്ണിന്റെ ഇനം) | Estimations (പരിശോധനകൾ) | P. H. (പി. എച്ച്.) മണ്ണിന്റെ ആഴക്കാര സ്വഭാവത്തിന്റെ അളവ് | T.S.S. EC in mhos/cm ലയിച്ചു ചേർന്നിട്ടുള്ള ലവണങ്ങളുടെ അളവ് | ലഭ്യമായ തിരിച്ചിലുള്ള പ്രധാന പോഷകമൂലകങ്ങൾ | | | മറ്റു മൂലകങ്ങൾ | | യൂണിറ്റ് |
|----------------------------------|-------------------------|--|---|---|----------------------|------------------------|-----------------|----------------|----------|
| | | | | Org. Carbon (%) നൈട്രജന്റെ മൂല മാനദണ്ഡം | P (kg./ha.) ഫോസ്ഫറസ് | K (kg./ha.) പൊട്ടാസ്യം | കാത്സ്യം (Ca) | മഗ്നീഷ്യം (Mg) | |
| Sandy മണൽ (പദാശം) | Value അളവ് | 5.1 | 0.1 | 0.91 | 43 | 224 | സൾഫർ (S) | 5.9 | S |
| Loamy (ചെമ്മണ്ണ്/പശിമടാരി മണ്ണ്) | Rating* തോത് | അളവ് | ക്രമം | കുറവ് | കുറവ് | കുറവ് | ഇരുമ്പ് (Fe) | 44.3 | S |
| Clayey (പശയുള്ള കളിമണ്ണ്) | | മധ്യം | അധികം | മധ്യം | മധ്യം | മധ്യം | സിങ്ക് (Zn) | 11.2 | S |
| മുറ്റിനങ്ങൾ | | കുറവ് | കുറവ് | കുറവ് | കുറവ് | കുറവ് | കോപ്പർ (Cu) | 2.1 | S |
| Class No. | | 4 | 0 | 4 | 9 | 5 | മാഗ്നീസ്യം (Mn) | 30.2 | S |
| | | | | | | | ബോറോൺ (B) | 3.1 | S |

*അനുയോജ്യമായ കോളങ്ങളിൽ ടിക് (✓) അടയാളം ഇട്ടിരിക്കുന്നു. S - Sufficient

| ക്രമ നമ്പർ | വിളകൾ | നൈട്രജൻ N g | ഫോസ്ഫറസ് P ₂ O ₅ g | പൊട്ടാസ്യം K ₂ O g | മഗ്നീഷ്യം Mg | കാത്സ്യം Ca | സൾഫർ S | ഇരുമ്പ് Fe | സിങ്ക് Zn | മാഗ്നീസ്യം Mn | കോപ്പർ Cu | ബോറോൺ B |
|------------|-------|-------------|--|-------------------------------|--------------|-------------|--------|------------|-----------|---------------|-----------|---------|
| | നെൽ | 309 | 43 | 483 | | | | | | | | |

| ക്രമ നമ്പർ | വിളകൾ | യൂറിയ Urea g | രാജ്ഫോസ്/റോക്ക് ഫോസ്ഫേറ്റ് Rajphos/Rockphosphate g | മ്യൂറോപ്പ് ഓഫ് പൊട്ടാഷ് MOP g | മഗ്നീഷ്യം സൾഫേറ്റ് Magnesium Sulphate g | ചാരം Ash | കുരുമുളക് Lime Kg | ഓർഗാനിക് മാനൂർ Organic Manure Kg | സൂക്ഷ്മ മൂലകങ്ങൾ Micronutrients | മറ്റ് നിർദ്ദേശങ്ങൾ Others | അളവ് Unit |
|------------|-------|--------------|--|-------------------------------|---|----------|-------------------|----------------------------------|---------------------------------|---------------------------|-----------|
| | നെൽ | 613 | 213 | 804 | 500 | - | 2.02 | 25 | - | - | 1000kg |

തീയതി: അസിസ്റ്റന്റ് സോയിൽ കെമിസ്റ്റ്, തിരുവനന്തപുരം - 695 015

Image 12: Test report from District Soil Testing Laboratory, Thiruvananthapuram (site: near Main Block)

From the above reports, the pH content of the soil is found to be around 6 which is comparatively good. Organic carbon, Phosphorous and Potassium content in the soil is satisfactory in both the specimens.

11.3. Sound level analysis

The World Health Organization (WHO) estimates that billion young people worldwide could be at risk of hearing loss due to unsafe listening practices. Over 43 million people between the ages of 12–35 years live with disabling hearing loss due to different causes. Among teenagers and young adults aged 12–35 years in middle- and high-income countries: Nearly 50% are exposed to unsafe levels of sound from the use of personal audio devices. Around 40% are exposed to potentially damaging sound levels at clubs, discotheques and bars



Image 15: Sound level meter

High sound levels/sound pollution results in mental and physical discomfort, loss of productivity and hearing problems in case of dangerous levels. Safe listening levels depend on the intensity (loudness), duration (length of time) and frequency (how often) of the exposure. However sound levels up to 70 dB is considered to be safe and above 85 dB is hazardous in case of long-term exposure.

In this context the sound level of the campus is analysed as a part on environmental audit using MECO 970p Digital Sound Level Meter as shown in the image. Different readings are taken at major locations as shown in below table and the results are found to be within safe limits.

Table 5: Result of noise level analysis

| Location | Reading 1(dB) | Reading 2(dB) | Reading 3(dB) |
|---------------------------|---------------|---------------|---------------|
| Office Block | 47 | 48 | 47 |
| | 48.1 | 48.6 | 48 |
| | 50.5 | 51 | 50 |
| | 53.9 | 55 | 54 |
| Main Block | 55.9 | 56 | 56 |
| | 56.5 | 57 | 56.4 |
| | 59.9 | 60 | 59.9 |
| | 47 | 47 | 47 |
| | 60.1 | 59 | 59 |
| | 54.1 | 56 | 54 |
| Golden Jubilee Block(UGC) | 56.9 | 56 | 56 |
| | 60.8 | 60 | 59.8 |

From the above readings, it is clear that majority of campus areas are under human comfort levels of sound at approximately 60 db.

12. COMMITMENT OF INSTITUTION TOWARDS ENVIRONMENTAL PROTECTION

12.1. Best Practices

| Sl.no. | Project | Status |
|--------|---------------------------|--|
| 1 | Renewable Energy | Solar power plant of 5 kWp capacity has been installed on the college rooftop. There is additional roof top area available in campus which can utilize for further addition of solar roof top power plants. |
| 2 | Biodiversity Conservation | The campus has a lush green campus which provides habitat to various species of birds. A bird count reporting to be established for the long-term monitoring plan of environmental audit purpose. |
| 3 | Tree plantation drives | Yes, periodic plantation drives have been conducted on behalf of the campus's NSS cell. Lack of supporting evidence has been noted and needs to be incorporated in the long-term environmental monitoring plan of environmental audit. |
| 4 | Air quality | Overall campus layout and building architecture allows maximum use of air movements for better thermal comforts. Overall air quality measured are rated as fresh and less polluted. Development of Oxygen Park within the campus would be an excellent addition to existing initiatives. |
| 5 | CSR activities | The management conducts various CSR activities related to environmental activities such as <ul style="list-style-type: none"> • Plastic reduction initiatives within the campus. • Awareness sessions. |
| 6 | Sound level | Majority of campus areas are under human comfort levels of sound at approx. 60 db. |

13. CONCLUSIONS

This audit involved extensive collaboration and consultation with campus team, government entities such as agriculture department, third party consulting agencies etc. to explore the wide range of issues related environmental parameters. Sree Narayana Training College, Nedunganda and its management has been proactively involved in various environmental friendly solutions and its implementations. However, a defined environmental policy, continuous monitoring of various environmental parameters and achieving carbon neutrality could place the institution as a role model for others and would help the management to incubate similar policies for achieving desired results from the evaluating bodies.

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