GREEN AUDIT REPORT

2022-2023

VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE

3/151-1, College Road,
Virudhunagar
Tamil Nadu- 626 001.

TJ Solutions
4/101, Raja Sir Muthiah Nagar,
Bye-pass road, Ellis Nagar,
Madurai-625 016.

TJ SOLUTIONS

AUDIT CERTIFICATE

PRESENTED TO

VIRUDHUNAGAR HINDU NADARS SENTHIKUMARA NADAR COLLEGE
VIRUDHUNAGAR

Has been assessed by TJ Solutions for the comprehensive study of the environmental impact on institutional working framework to fulfill the requirement of

GREEN AUDIT

2022-2023

The green initiatives carried out by the institution have been verified on the report submitted and found to be satisfactory.

The effort taken by the management and faculty towards Environment and Sustainability is appreciated .

Auditor signature

Dr.S.Balraj,M.E.,Ph.D-(EA-15051)

Dr.S.BALRAJ, M.E.,Ph.D.,
Certified Energy Auditor.,
B.E.E. Reg.No: EA-15051

4/101 , Raja Sir Muthiah Street, Bye Pass Road , Ellis Nagar, Madurai – 625 016
Email : tjsolutionsmadurai@gmail.com **Ph no: 94431 54641**

TJ Solutions ★ Madurai-10 ★

ACKNOWLEDGEMENT

We at TJ Solutions, Madurai are thankful to the Principal for giving us the opportunity to carry out Green audit of VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE, Virudunagar -626001, Tamilnadu, India. TJ Solutions team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from TJ Solutions under the guidance of Mr. S.Balraj M.E.,Ph.D., have carried out the Green Audit.

Name	Qualifications	Certification Number
Mr.S.Balraj	M.E.,Ph.D.,Energy auditor	EA-15051
Mr. N. Tamil selvan	BSc.,	ISO Lead Auditor /Energy consultant
Mrs.Tamil selva parvathi	MSc.,DTC.,PGDESD.,	Environmentalist
Mr. R.Manikandan	DEEE	Electrical Data Analyst
Er. A .Rajendran	B.E,	Electrical Engineer
Er. P.Deleepan	B.E	Assistant Engineer (Electrical / Energy)

Energy Auditor

TJ Solutions Madurai-10

Index

I. Summary of the Green Audit

Green audit of **VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE** and its **HOSTEL** was carried out by TJ solutions. The green audit reports assist in the process of attaining an eco- friendly approach to the sustainable development of the college. Green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This will lead to a prosperous future in the context of Green Campus leading to sustainable environment and community development. It has been proved frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organisation. It is hoped that the results presented in the Green Audit Report will serve as a guide for educating VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE on the existing environment related practices and resource usage and spawn new activities and innovative practices.

Noteworthy activities

- MAXIMUM utilisation of Renewable energy (solar power plant, solar water heater, biogas, biomass).
- Rainwater harvesting system covers the entire build up area of 35,000 sq ft.
- A part of rain water is used for LAB purpose after deionization
- Pond is maintained on the campus.
- Pedestrian friendly pathway is available.
- Green buildings are constructed on the campus.
- Ramps and Divyangja friendly washrooms are available in the campus.
- Sensor based energy conservation unit is constructed.

- Restricted entry of automobile premise is maintained.
- Press type water tap is used to reduce the water usage.
- Initiation and implementation for less paper consumption.
- Clean and Green campus.
- Digital display board is maintained in the campus for daily notice.
- Carbon sequestration trees are grown in the campus to reduce the carbon content in the atmosphere.
- Ro reject water is used for gardening purposes.

The audit outputs and recommendations are summarised as follows:

- Total water consumption forVHNSNC college for women and Hostel –81 KL/Day
- Electrical Energy consumption from TNEB GRID alone –231354 units
- Diesel Generator electrical energy consumption- 5200 units
- Solar photovoltaic power plant electric energy consumption- 16461.5 units
- Energy from Wind Mill -9672.5 units
- Total Electrical Energy consumption -273088 units
- Total Renewable energy utilisation- 53974 units (equivalents)
- Biomass [wood] consumption is 6000 kgs
- GreenHouse Gas Emission – 946.8 t CO_2e Total GHG emission

We are happy to submit this detailed green audit report to the VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE.

TJ Solutions

Madurai

1.1 Green Policy

VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE has formulated a detailed Green Policy to guide all its green initiatives. Cleanliness in the campus is maintained through proper disposal of wastes, utilisation of eco-friendly supplies and effective recycling program. The concept of eco-friendly culture is disseminated among the students through various seminars/workshops and community-oriented programs. Institution strictly follows reduce, reuse and recycle method to limit energy usage and also to replace non-renewable energy sources to renewable energy resources

The main objectives are as follows:

- To create a pollution free environment through a proper waste management system.
- To encourage rainwater harvesting.
- To signify the effective use of water among students and for future needs.

The Institution vouchsafes:

- Its commitment to sustainability and environmental management
- It reiterates the stand that managing environmental issues is a high priority for the College
- Its commitment to prevent pollution and to continuously improve upon environmental protection.
- A commitment to keeping students and staff safe from any environmental hazards.

1.2 Total Campus Area & Building Spread Area

- Campus Area in 145.27 Acres & Building Spread 51,273.39 area in sq.mts.

1.3 NAAC Grading

- Re-accredited (4rd cycle) by NAAC with 'A' Grade - CGPA 3.01 on a 4-point scale

1.4 Campus Infrastructure

VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE is located in calm and quiet surroundings that are conducive to learning. It helps to stimulate both personal and professional growth of the students. The campus is located about 4.7 Kms from the Virudunagar railway station.

CLASSROOMS

Spacious, well ventilated and well-equipped classrooms with projectors and screens facilitate and reinforce effective teaching-learning experience for the faculty and students.

LABORATORIES

VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE has set up highly advanced science and computer laboratories attached to different departments. These are adequately equipped with the latest gadgets, instruments and apparatus with the aim of providing students conceptual as well as practical understanding of the subject through hands-on training.

LIBRARIES

The library is dedicated to support the student's activities and programs of the institution. It accomplishes college mission by maintaining an up- to–date collection of books, journals, audio-visual items and other library materials related to study. An open access system of reference for easy accessibility is available for both UG & PG students. The whole college community has the benefit of the open access system.

The library also responds to the needs of the teaching staff for effective teaching and research.

24/7 CONNECTIVITY

Understanding and underscoring the need for online connectivity, the hostel campus is technology-enabled with 24/7 high-bandwidth Wi-Fi connectivity. This facility is open to students and staff on hostel campus for accessing both the Internet and the Intranet.

DRINKING WATER

The College provides safe drinking water to all on campus by RO Water System. These water purifiers are maintained and serviced by authorised professionals at regular intervals.

BANKING

A Bank facility is available to help the students make banking transactions without any inconvenience.

Other facilities available to the students

- Hostel
- Mess
- Transportation
- Parking areas
- PlayGrounds and Indoor Stadium
- Canteen
- Scholarships

2. Pre-Audit Stage

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the auditee and deal with any concerns.

The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance the audit itself.

In VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE pre-audit meeting was conducted successfully and necessary documents were collected directly from the College before the initiation of the audit processes. Actual planning of audit processes was discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management.

The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. The audit team worked together, under the leadership of the lead auditor, to ensure completion within the brief and scope of the audit.

2.1 Management's Commitment

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly and planting more trees on the campus etc., after the green auditing.

2.2 Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who is part of economic, financial, social, and environmental factors. It is necessary to conduct a green audit in the College campus because students become aware of the green audit, its advantages to save the planet and they become good citizens of our country.

A very simple indigenized system has been devised to monitor the environmental performance of VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE Virudunagar. It comes with a series of questions to be answered. This innovative scheme is user friendly. The aim of this is to help the Institution to set environmental examples for the community and to educate the young learners.

2 .3 Benefits of the Green Auditing

- More efficient resource management
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimising and management
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organisations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and Improving environmental standards
- Benchmarking for environmental protection initiatives

- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the College and its environment
- Enhancement of college profile
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

2.4 Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out at defined intervals and their results can illustrate the improvement.

Eco-campus concept mainly focuses on the efficient use of energy and water; minimise waste generation or pollution and also economic efficiency. All these indicators are assessed in the process of "Green Auditing of educational institutes". Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, reduce the institute's energy and water consumption, reduce wastes to landfill and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

Auditing for Water Management

Water is a natural resource; all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in future. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible Institution should examine its water use practices.
Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible Institution examine its water use practices.

Auditing for Energy Management

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of

campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60 W while an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

Auditing for Waste Management

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. This indicator addresses waste production and disposal of plastic waste, paper waste, food waste, and recycling.

Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and used oils.

Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable college. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

Auditing for Green Campus Management

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings.

Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while the students are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner.

Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which the students feel.

Auditing for Carbon Footprint

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising around 415 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method travelled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organisation through which the carbon accounting is done. It is necessary to know how much the organisation is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprint.

3. Audit Stage

In VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE green auditing was done with the help of TJ solutions involving different student groups, teaching and non-teaching staff. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities as well as measuring the usage per item and identifying the relevant consumption patterns and their impacts.

The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified to clarify the data received through survey and discussions.

3.1 Student Clubs and Forums Involved

- ECO Club,National Service Scheme(NSS), Youth Red Cross, Red ribbon club,Green club

3.2 Comments on Site Tour

Site inspection was done along with students and staff. Questionnaires were answered during the site tour. Students and staff took much interest in the data collection processes. It was quite interesting and fascinating. It was an environmental awareness program for the students who participated in the green auditing. The experience of green auditing was totally a new experience for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations.

3.3 Review of Documents and Records

Documents such as electricity and water charge remittance, laboratory equipment registers, audited statements and office registers were examined and data were collected. College calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as a part of data collection.

3.4 Review of Policies

Discussions were made with the College management regarding their policies on environmental management. Future plans of the college were also discussed. The management would formulate an environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the Institution.

3.5 Interviews

In order to collect information for green auditing different audit groups interviewed teaching and non-teaching staff, students and other stakeholders of the college.

3.6 Site inspection

College and its premises were visited and analysed by the audit-teams several times to gather information. Campus trees were counted and identified. Vegetable gardens, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data. Number and type of vehicles used by the stakeholders were counted. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted.

4. Post Audit Stage

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner.

Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit.

The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components is crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the organisation's environmental performance.

4.1 Key Findings, Observations and Evaluations

a) Water Usage at VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE

Total number of students studied during the academic year 2022-2023: 3539

Teaching & non-Teaching staff in the institution during the academic year 2022-2023; 313

Total number of stakeholders: 3852

Water for college and hostel

Total water usage -81,000 litres/day

Main water uses in the College campus are Laboratories, Drinking, Restroom, Canteen, Garden, and Construction

Water usage at College

Sl. No	Place	Water usage Quantity Litres / Day
1	Laboratories	2,000
2	Drinking	4,000
3	Garden	25,000
4	Rest room	15,000
5	Cleaning	2,000
6	Construction	10,000
7	Canteen	1,000
	Total	**59,000**

Water usage in the College- 59 KL / Day

Water usage per day per stakeholder in the college –15.3 litres

Waste water generation in the college – 20 KL/day

Water usage at Hostel

Number of students and staff residing in the hostel in the year 2022-2023 : 417

Main water uses in the Hostel are Drinking, Washing of clothes, Cooking & Vessel cleaning and for Restroom

Water usage at Hostel

Sl. No	Place	Water usage Quantity Litres / Day
1	Cooking	5,000
2	Drinking	1000
3	Garden	1,000
4	Toilet ,Bath room and clothes washing	10000
5	Vessel Cleaning	5,000
	Total	22,000

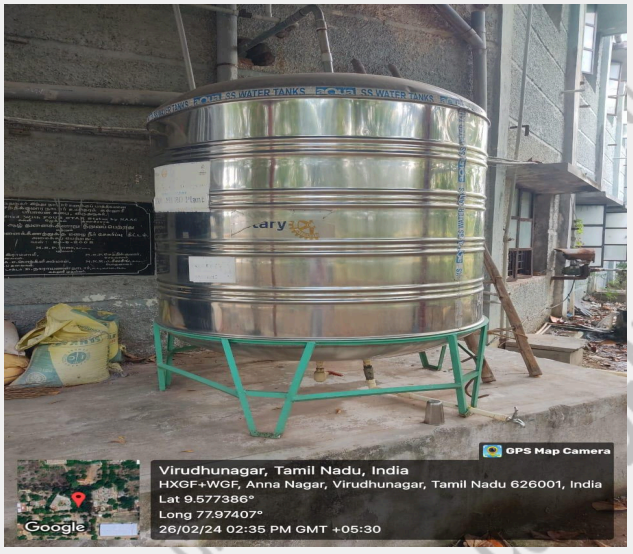
Water usage at Hostel - 22 KL / Day

Water consumption per day per stakeholder in the hostel – 52.7 litres

Waste water generation in the Hostel – 16 KL /day

For drinking water: RO water system was installed

- Analysis of Drinking water and bore well water samples are done periodically
- 2000 LPH RO plant is installed in the campus
- The quality of Drinking water is within the norms.
- Microbial tests for Drinking water are carried out in a periodical manner.



Rainwater Harvesting

At VHNSN college, rainwater harvesting is done effectively to enhance the groundwater level and also recharge well. Rainwater collection drains are constructed in all buildings and connected to a well for the further use. Deionized rainwater is used in the LAB.

The college has effectively taken maximum steps to harvest rainwater inside the campus.

- Rainwater collected from all the areas are used to recharge the ground

Water Conservation initiatives

- Water taps are changed to press type to reduce the wastage of water
- RO water rejects are collected and used for garden
- AC outlets are collected and used for gardening.

b) Energy

Non Renewable Energy

TNEB Grid Electrical Energy Consumption: 2022-2023

ELECTRICAL ENERGY CONSUMPTION IN THE COLLEGE AND HOSTEL

TNEB ENERGY CONSUMPTION			
Sl. No	Units Consumed	Bill Amount -Rs	Average Unit cost-Rs
1	2,31,354	2416262	10.4

Diesel Generator Electrical Energy Consumption: 15600 units

ELECTRICAL ENERGY CONSUMED	UNITS
Diesel Generator (Based on diesel consumption)	15600

Solar power Electric energy consumption : 2022-2023

Sl. No	Solar Capacity KW	Solar Power Generation Units
1	11	16461.5

Wind Mill power Electric energy consumption : 2022-2023

SL.No	Wind Mill Capacity KW	WindMill Generation Units
1	1.8 KW	9672.5

Total Electrical Energy consumption in the College & Hostel -273088 units

Electrical Energy consumption per stakeholder per year - 70.8 units

LPG

For cooking LPG gas is used in the hostel & College canteen and for heating in the lab
LPG cylinders used 920 - commercial cylinders of 19 kgs capacity

- LPG consumption in the hostel mess during the year 2022-2023- 900 nos.
- LPG consumption in the college during the year 2022-2023- 20 nos.
- **Total LPG consumption during the year 2022-2023- 17480 kgs**

Renewable Energy

Solar Water Heater

Total solar water heater installed capacity in the hostel **- 600 LPD**

Solar PV Power Plants

Solar Power Plant Details		
VHNSNC		
Name	**Solar Panel Capacity**	**Grid Type**
VHNSNCollege	11 KW	ON Grid

Solar Street Light

40 W Solar Street lights- 30 nos

Solar power generation and utilised from all the street lights-5256 units

Windmill

Windmill capacity of 1.8KW generates 9672.2 units of electricity

Biogas

The Biogas plant generates 2640 M^3 from the Hostel food waste.

Biomas

Biomass consumption - 6000 Kg

The energy conservation measures followed

- The fans, lights, air-conditioners and other electronic and electrical equipment are switched off when not in use.
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs.

- Replacing old high energy consuming appliances with five star rated energy efficient appliances.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- Electrical equipment like CROs, Oscillators, Sodium lamps are switched off in the laboratory when the students complete their observations.
- At the end of every practical session, Computer monitors and UPS are switched off.
- Periodical maintenance and overhauling of generators is being carried out.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the college hours.
- Staff and Students are made aware of vehicle pooling.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

c) WASTE

Quantity of waste generated:-

Office

- Biodegradable – <0.25 kg/day
- Non-biodegradable –< 0.1kg/day

Labs

- Biodegradable – <0.5kg/day
- Non-biodegradable –< 0.5 kg/day
- Hazardous waste –<500 ml/day

College Canteen

- Biodegradable –2 kg/day
- Non-biodegradable –<0.5kg/day

Hostel

- Biodegradable - 60- 75 kg/day
- Non-biodegradable – <1kg/day

Open area

- Biodegradable (Dry leaves)- 25 Kg/Day

❖ **Waste Management**

Each Class Room bins are placed with instruction to drop paper waste and non -bio degradable waste

Bio-degradable waste management

Bio-degradable waste is utilised effectively and efficiently

❖ Separate dustbins are kept to collect the waste food and used plates.

❖ Bio-Degradable and non-biodegradable waste are collected in separate bins provided.

❖ Withered dry leaves are collected separately and dumped in the pits and converted into Bio fertiliser

Plastic Waste Management

- The college has been declared as a 'Plastic Free' zone.
- Use of polythene bags, plastic cubs and laminated papers are prohibited.
- Students and staff are advised to bring cloth bags
- All the stakeholders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Use of plastic folders for assignments and projects are prohibited.
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling.

Used Battery Management

- Used batteries are disposed through Buy back method

E-Waste Management

- All Computers and electronic machinery is purchased under Buy-Back agreement
- Arrange to make a MOU with Authorised E. Waste collector for disposal of E. Waste

Hazardous Waste Management

- To get rid of toxic fumes in the Chemistry laboratory, a separate fume hood and industrial exhaust fans are installed.

Other Solid Waste Management

- Solid wastes generated from damaged furniture are sent to the waste wood collection centre. Useful furniture and other wooden materials are made from the waste
- Glass wastes are disposed of periodically through the municipal waste collection system.

Liquid waste Management

- Grey water from hostel is collected separately and treated and used for gardening
- RO plant rejects are used for toilet purposes.

Waste Reduction

➔ Students are instructed not to waste paper while writing examinations.

➔ In order to reduce the use of paper the following initiative were taken

- ❖ Student admission- E Portal
- ❖ Attendance – Electronic Method

- ❖ Payment of fees- Through Bank net banking system
- ❖ Selection of elective courses
- ❖ Online assignments
- ❖ Submission of e-assignment through email
- ❖ Profile of staff and students are made online
- ❖ Office circulars through SMS, WHATSAPP or Email
- ❖ Online Admission Process – Printing of applications reduced & submission of applications through admission portal.
- ❖ All inter department communications are through intranet
- ❖ Online exams are conducted to reduce paper usage.
- ❖ Library accessibility through library smart card.

Waste Recycling

Recyclable papers are collected and kept and disposed as mixed waste to paper mills through authorised Vendors.

- The answer scripts after the publication of results are sent for recycling.
- Other papers are shredded and sent for recycling
- E wastes are collected and kept for disposal through an authorised recycler.

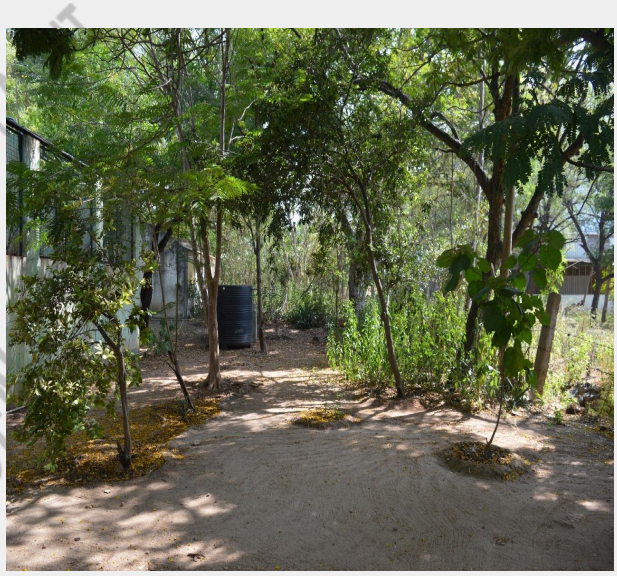
d) Green Campus

- The campus is lush green with gardens, lawns and plants wherever there is open space.
- The eco-friendly ambience of the campus is a noteworthy feature of VIRUDHUNAGAR HINDU NADARS SENTHIKUMARANADAR COLLEGE.
- Green belt is developed in a 10 acre Area.
- The Department of Botany is maintaining a medicinal garden , and Botanical garden .
- Special initiatives are taken by the Department of Botany and new saplings are planted every year. Altogether, there are 4758 trees in the campus.
- The list of trees and the arrival of new saplings are recorded every year.

- All the plant specimens are identified and documented.
- Some of the projects done by the UG and the PG students of the Botany Department are based on green initiatives.








Routine Green Practices

- Every year new tree saplings are planted inside the college campus.
- The Green campus drive is an initiative of the College to protect the environment.
- The campus protects age-old trees in addition to several new trees and plants planted.
- The NSS, NCC,YRC,RRC, of the college take special care to keep the campus neat and green.
- Tree plantation programs are organised regularly in coordination with the external environmental organisations.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.

S.No	Tamil name	Common name	Binomial name
1	Thennai	Coconut tree	*Cocos nucifera*
2	Maa	Mango	*Mangifera indica*
3	Koiyaa	Guava	*Psidium guajava*
4	Yelumichai	Lemon	*Citrus limonum*
5	Maadhulai	Pomegranate	*Punica granatum*
6	Seetha	Sugar apple	*Annona squamosa*
7	Aaranju	Sweet orange	*Citrus sinensis*
8	Sapota	Sapota	*Manilkara zapota*
9	Nellikaai	Gooseberry	*Phyllanthus emblica*
10	Pappali	Papaya	*Carica papaya*
11	Santhanam	Sandal	*Santalum album*
12	Semmaram	Red sander	*Pterocarpus santalinus*
13	Thaekku	Teak	*Tectona grandis*
14	Marudha maram	Arjuna tree	*Terminalia elliptica*
15	Naaval	Jamun tree	*Syzygium cumini*
16	Punnai	Tamanu	*Calophyllum inophyllum*
17	Pungai	Indian beach tree	*Pongamia pinnata*
18	Vembu	Neem	*Azadirachta indica*
19	Sorkkamaram	Paradise tree	*Simarouba glauca*
20	Manjal konrai	Ironwood	*Cassia siamea*
21	Sivapu konrai	Gulmohar tree	*Deloni regia*
22	Sarak konrai	Golden shower tree	*Cassia fistula*
23	Mahilam	Bullet wood tree	*Mimusops elengi*
24	Ilavam panju	Silk cotton tree	*Ceiba pentandra*
25	Naatu Athi	Fig tree	*Ficus carica*
26	Mahogany	Honduran tree	*Swietenia macrophylla*
27	Iluppai	Butter tree	*Madhuca longifolia*

28	Palaa	Jack tree	*Artocarpus heterophyllus*
29	Vaalai	Banana tree	*Musa paradisiaca*
30	Moongil	Bamboo	*Bambusa species*
31	Marudhani	Henna	*Lawsonia inermis*
32	Puliyamaram	Tamarind tree	*Tamarindus indica*
33	Naarthangai	Citron	*Citrus medica*
34	Vaadham	Almond tree	*Terminalia catappa*
35	Nettilingam	False Ashoka	*Polyalthia Longifolia*
36	Aranelli	Malay gooseberry	*Phyllanthus acidus*
37	Arali	Oleander	*Nerium oleander*
38	Thanga arali	Yellow bells	*Tecoma stans*
39	Mantharai	Purple bauhinia	*Bauhinia purpurea*
40	Plumeria	White champa	*Plumeria alba*
41	Sembaruthi	China rose	*Hibiscus sinensus rosa*
42	Mini idli poo	Mini Ixora	*Ixora chinensis*
43	Poovarasu	Portia tree	*Thespesia populnea*
44	Munthiri	Cashew	*Anacardium occidentale*
45	Achi Naruvili	Geiger tree	*Cordia sebestena*
46	Maramalligai(Panneer)	Tree Jasmine	*Millingtonia hortensis*
47	Crotons	Croton	*Codiaeum variegatum*
48	Roja	Rose	*Rosa indica*
49	Texas silver	Purple sage	*Leucophyllum frutescens*
50	Venkai	Indian kino	*Pterocarpus marsupium*
51	Madu panai	Queen sage	*Cycas circinalis*
52	Thuja	Thuja	*Thuja occidentalis*
53	Thaen palam	Malaysian cherry	*Muntingia calabura*
54	Aalamaram	Banyan tree	*Ficus benghalensis*
55	Arasamaram	Peepal Tree	*Ficus religiosa*
56	Bignonia	Bignonia	*Bignonia species*

e) Carbon Footprint

Release of carbon dioxide into the atmosphere contributes to global warming and increases the pace of climate change. More trees in the campus will make a source of sink for the carbon dioxide and for other greenhouse gases.

- Diesel consumption by 2 college buses per year-5200 L
- Diesel consumption by DG sets in the college/hostel – 5200 L
- Total Diesel Consumption- 10400L
- Radius of Viruthunagar town-25 KM
- Average distance travelled by staff and students per day from home to College and back to home -15 KM
- No of four wheelers being used by students and staff -6
- No of two wheelers being used by students and staff -524
- College working days during the year 2022-2023: 210 days
- Average Fuel efficiency of four wheelers – 20 KM/ L
- Average Fuel efficiency of two wheelers -60 KM/ L
- Average Petrol consumption by four wheelers -945 L
- Average Petrol consumption by two wheelers-27510 L
- Total Petrol consumption- 28455 L
- Total LPG consumption(Hostel & canteen & College) per year-17480 Kg
- Total electrical power consumed from Grid- 231354 units
- Biomass consumption-6000 Kg

- Green House Gas emission due to diesel 27768 Kg CO_2 e
- Green House Gas emission due to petrol 671538 Kg CO_2 e
- Green House Gas emission due to LPG 52964.4 Kg CO_2 e
- Green House Gas emission due to Grid power 187396.74 Kg CO_2 e
- Green House Gas emission due to Biomass 7200 Kg CO_2 e
- Total GHG emission 946867.14 Kg CO_2 e

946.8 t CO_2 e

4.2. Consolidation of Audit Findings

We hope that students would have developed a greater appreciation and understanding of the impact of their actions on the environment. They have successfully been able to determine the impacts on the environment through the various auditing exercises. Participating in this green auditing procedure they have gained knowledge about the need for sustainability of the college campus. It will create awareness on the use of the Earth's resources in their home, college, local community and beyond.

General

- Green Policy is stated and objectives are reflected very well in the functioning of the college and Hostel
- Gardens inside the college premises are found to be well maintained.
- More number of notice and sign boards are placed in the campus to create awareness
- Solar cooker is available on campus.
- Campus is declared plastic free and a lot of initiatives and innovative actions are taken to maintain the green policy.
- Digital notes board is installed in the campus.
- Online registration facility is available for all documentation work.
- Green buildings are constructed on the campus.
- Ramp and pedestrian friendly path is constructed.
- Rainwater is stored in a tank and used for Chemistry LAB

Water

Total water consumption -81 KL/day

- Water management & waste water management strategies are well maintained.
- Ro reject water is used for gardening purposes, hand wash and toiletry purposes.

Water Conservation

- Water taps are converted into press types to reduce water wastage.
- Drip irrigation is constructed for garden purposes.

Rainwater Harvest system

Appreciable work has been carried out for harvesting the rainwater both from college buildings & hostel for charging the well water level and usage.

Energy

Total electrical energy consumption from TNEB Grid-231354 units

Energy saving activities implemented.

Renewable energy- Solar Thermal water heaters

Solar water heater installed capacity - 600 LPD

Grid electrical energy(equivalent) saved due to Solar water heaters-9000 units/year.

Renewable energy- Solar panel

Solar panel installed in the campus- 11KW

Electrical energy saved due to solar panel-1646.5 units

Renewable energy- Solar Street light

Solar street light capacity- 40W *30 Nos = 1200W

electrical energy saved due to street light- 5256 units

Renewable energy- Biogas

Biogas consumption during the year 2022-2023 -1584 units

Renewable energy- Biomass

Biomass consumption during the year 2022-2023 in the hostel -6000 kgs

Renewable Energy usage- Breakup

Total renewable energy usage in college and hostel together during the year 2022- 2023 is 53974 units

Sl. No.	Renewable Energy	Electrical Energy/Equivalent Electrical Energy
1	Solar Photovoltaic	16461.5 units- Electrical Energy
2	Solar Thermal	9000 units- Equivalent Electrical Energy
3	Solar street light	5256 units- Equivalent Electrical Energy
4	Biogas	1584 units- Equivalent Electrical Energy
5	Biomass	12000 units- Equivalent Electrical Energy
6	Energy From Wind Mill	9672.5 Units - Electrical Energy
	Total	53974 units

Waste to Wealth

Inside the campus

- Biogas generation from food waste through Biogas plant 8 M^3 per day
- Dry leaves are converted into bio fertiliser

Reduction in usage of Hazardous chemical

- Most of the Hazardous chemicals are replaced with green chemicals

- Micro scale laboratory is implemented in chemistry to reduce the usage of chemicals

Waste Recycle

- Paper wastes are collected in a proper manner.
- E - wastes are collected and sent to authorised recycler(MOU)
- Plastic wastes generated from packing materials are collected separately and disposed properly
- Milk cover from Hostels and canteen are collected separately and disposed

Green Campus

- Tree cover of the college with respect to the stakeholder strength is good
- Regular planting of trees inside and outside campus are to be continued
- Usage of water for gardens are to be measured
- Solar street light is installed in the campus

Carbon Footprint

- Yearly Greenhouse gas emission is around 946.8 t CO2eq
- Electric bikes were used by staff and students.
- Initiatives for accounting of GreenHouse Gas reduction other than Solar Power also have to be taken into consideration.
- Apart from students/staff using public transport, some of the Students/staff come to college by own vehicles (6 four wheelers and 524 two wheelers.)
- Number of vehicles shall be reduced by pooling

4.3. Preparation of Action Plan

Policies referring to college's management and approach towards the use of resources need to be considered. The college green policy/environmental policy for its sustainable development to be monitored consciously.

4.4. Follow-up Action and Plans

Green Audits are exercises which generate considerable quantities of valuable management information. The time, effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement.

4.5 Environmental Education

The following environmental education program may be implemented in the college before the next green auditing:-

- Training programs in Liquid waste management, setting up of Water management, Carbon footprint concepts, Awareness on Global warming
- Increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, switch off light and fan after use, plastic free campus etc.

Awareness on Carbon Consumption

- Students and Staff members may be made totally aware of pollution caused by use of vehicles.
- The carbon consumption awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

4.6 Recommendations

Targets for environmental policy shall be fixed

Establish a purchase policy to procure environmental friendly materials

Criteria Wise Recommendations

Water

- Water consumption monitoring system and wastewater treatment facility has to be implemented in the college campus and hostel
- Establish waste water treatment systems and reuse the water for gardening and toilet flushing
- More awareness programs on water conservation to be conducted
- UV light to be fixed at the outlet of RO unit for disinfection.
- Flow meter to be provided at source to know the water consumption and for better water management.

Energy

- Target for Reduction in Overall electrical energy consumption to be planned Present consumption is 2,31,354 units
- Maximise the utilisation of Solar Power Plants generation in the college
- Installing more capacity solar power plants shall be planned.
- Conduct more awareness program and energy saving for students and staffs
- Old tube lights were replaced with LED tube lights.
- Sensor based power switch off systems may be installed in more places.
- Green building concept shall be planned for the new buildings.

Waste

- Conduct exhibition of recyclable waste products.
- ETP can be constructed for waste water treatment.
- Targets for reduction in waste generation shall be planned.
- Every six months e-waste to be disposed of as per e-waste Management rules 2016. Not to be stored for more than 180 days.
- Register to be maintained for collection, storage and disposal of E waste & used batteries.
- MoU may be signed with agencies to dispose of Bio-Medical waste.

Green Campus

- Grow potted plants at both veranda and class rooms.
- Beautify the college building with indoor plants
- Keep continuously encouraging students for making the campus green
- Periodically remove the dead trees and plant a new saplings
- Roof garden for some building shall be planned in future

Carbon footprint

- Fix a target to reduce GreenHouse Gas emission
- Plan to achieve Net-Zero Energy building in future
- Plan for E vehicle for commutation.
- Motivate the students to use the public transport system and bicycle.