

GREEN POLICY

OF

NETAJI SUBHASH ENGINEERING COLLEGE

About the College:

Netaji Subhash Engineering College, affiliated to the Maulana Abul Kalam Azad University of Technology (formally known as West Bengal University of Technology), is the first self-financed engineering college in West Bengal. It is located at Garia, Kolkata. It was established in 1998 to promote the technical education in the state. Since then, the College has been serving the society by educating its population.

Green Policy:

The Green Campus Policy of the college aims towards a Clean and Green campus where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus and beyond the campus. It also offers the institution an opportunity to redefine its environmental culture through inculcating environmental ethics among the students and staff.

Taking into account the necessity of protecting environment for a sustainable, pollution-free and healthy life on the planet Earth in the coming years, the college has formed its Green Protocol. The college is determined to follow the policy strictly by implementing it. The college also acts to create environmental consciousness among the students, staff and the local community in general on a continuous basis through various related activities within and outside campus. The college is dedicated to create a clean, green and healthy environment in the campus.

Aims:

It aims to create environmental consciousness among the community and acts towards a sustainable, pollution-free and healthy environment, hence to protect our mother earth.

Objectives:

- To aware the students and the staff to minimize the use of polluting products and use environment-friendly products and services.
- To inculcate the importance of cleanliness for a healthy life among the staff, students and the society.
- To create environmental awareness by organizing various activities inside and outside the campus.
- To aware the trainees, staff, local community and in general the society about the proper disposal of wastage and adopt health & environment friendly practices.

Initiatives to implement the Policy:

To implement this policy, the following measures have been taken:

❖ Plantation of Trees and Plants:

The college campus is fully protected by a well-constructed boundary wall on all sides. The college has a large green campus with both big trees and small shrubs which offer a very eye-soothing view to all. The college will encourage the maintain the GREEN of the campus.

❖ Cleaning the campus on regular basis:

All the staff and students will participate in the cleaning programme as an inseparable part of Swachh Bharat initiative. Social awareness programmes will be organized every year to spread awareness regarding various environment related contemporary issues.

❖ Observance of “Environment Day”:

Every year the World Environment Day will be celebrated to spread the values and importance of environment in our life. Every year plantation initiatives will be taken and saplings will be planted both in the ground and earthen pots.

❖ Motivating the Society to take part in green initiative:

The college will take initiatives to include gifting plants in the felicitation of guests and resource persons as a part of GREEN INITIATIVE.

❖ Creating a small space garden of Medicinal Plants:

One small garden for medicinal plants has been constructed. Some basic medicinal plants e.g. Ocimum sanctum, Aloe vera, Ocimum gratissimum, Andrographis paniculata, Phyllanthus emblica, Curcuma longa, Amomum subulatum, Syzygium aromaticum, Azadirachta indica, Catharanthus roseus etc. are grown here.

❖ **Reducing the use of Plastic and converting the campus as “No Smoking Zone”:**

The entire campus will be a “No smoking zone”. Use of plastic will be drastically minimized.

❖ **Rain Water Harvesting:**

This technology is used to conserve rainwater by collecting, storing, conveying and purifying of rainwater that runs off from rooftops, roads, open grounds, etc. for later use.

❖ **Motivating the Stakeholders to take part in Green Initiatives:**

There is a practice to plant saplings of indigenous trees (prepared in the college) each year. Plant saplings are gifted to other places also.

❖ **Engaging the Alumnus in green initiatives:**

The alumni of this college have always been involved in all good and positive initiatives undertaken by the college. **Alumni** organize meetings on the theme of environmental awareness.

❖ **Paperless work and communication:**

The college has a policy to minimize the use of paper in all types of official/academic Work and communication through E- Communication. The use of paper is substantially reduced through digitization. One-side blank pages are re-used for rough work to avoid wastage of paper. All the college staff, faculty and students have been provided the college E-mail IDs through LMS “Google Workspace for Education. They communicate for the required official and college-related academic activities through What’s app - Class-wise groups, Department wise groups, Committee wise groups and Activity wise groups that have reduced the usage of paper in notices and circulars. Moreover, the college has avoided massive usage of paper by introducing the "Virtual Classrooms" wherein references, notes, syllabi, question banks, study material are stored and shared on the e-platform. Some departments have also started accepting E-assignments. The admission procedure has been performed totally online. Examination form fill-up, marks up-loading, etc. are also been performed through online portal. Examinations and classes are also held online in the year of COVID/Lockdown. Library has also been fully automated with the software package LibSys. As a result paper use has been minimized otherwise required for book processing and circulation process. These practices has been proved highly beneficial to save money, boost productivity, save space, make documentation and information sharing easier, and help the environment.

❖ **To encourage using Bi-cycles in the campus and reducing the use of Diesel-Petrol:**

Students will be encouraged to use bi-cycle instead of diesel-petrol vehicles.

❖ **Environment Consciousness through creative Wall Posters**

Wall posters will be especially dedicated on “Environmental awareness” theme. Every year a few writings are to be taken on the theme students.

❖ **Environment awareness through various activities:**

The college organizes various activities and programs such as street play, rally in the local area, tree plantations, and cultural activities to aware all the stakeholders and the society.

❖ **Solid Waste Management:**

All the Departments, laboratories, and Classrooms will be provided with bins for dry wastage disposal. Segregation of the waste into dry and wet waste will be done through the separately allotted dustbins at strategic locations in the college.

- Landfills: Throwing daily waste /garbage in the landfills are done which eliminates odors and dangers of waste.
- Composting: The remains of the dead plants and kitchen waste from the canteen is turned into nutrients rich food for plants in the form of compost.

Faculty members and college students are motivated to segregate plastic from normal waste and dispose of it accordingly. Regular waste management is done by selling off the unwanted material to the local vendors.

❖ **E-waste Management:**

Old batteries, computers and wires will be segregated and sold off at regular intervals. The college repairs the old broken items instead of buying new ones.

❖ **Use of LED Bulbs/Tubes and Power Efficient Equipment:**

We are trying to maximize the use of LED bulbs, tubes and power efficient equipment.

❖ **Solar Plant in the College:**

The college will take the Initiatives have to implant solar plant in the college. Inspection has been done, proposal approved and work are in progress.

GA/NSEC/2022-23/02

GREEN AUDIT, ENVIRONMENT & ENERGY AUDIT CERTIFICATE

Is awarded for 2022-2023 to the Esteemed Institution
NETAJI SUBHASH ENGINEERING COLLEGE COLLEGE,
Mauza Ranabhatia, Techno City, Garia, Ranabhatia, West Bengal 700152, India

This is to certify that NETAJI SUBHASH ENGINEERING COLLEGE, Garia, Kolkata has conducted detailed Environmental Green Audit including Energy Audit for 2022-23 for their campus and submitted necessary data and credentials for scrutiny. The activity and measure carried out by the college was found satisfactory. The efforts taken by the students, faculty members and the college authority towards Environment and Sustainability is highly appreciated and commendable.

Issued on 5th September, 2023 and valid till 4th September, 2024



Dr. Indranil Ghosh
Environmental Auditor &
Associate Professor in Environmental Science

GREEN AUDIT REPORT OF NETAJI SUBHASH ENGINEERING COLLEGE 2022-23



AUDITED BY

ENVIRONMENTAL SAFETY AND HEALTH AUDIT AGENCY (ESHAA)

CERTIFICATE

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Dr Indranil Ghosh

Environmental Safety Health Audit Agency (ESHAA)

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Environment Safety Health
Audit Agency (ESHAA)

Executive Summary

In accordance with the Environmental policy of Netaji Subhash Engineering College for 2022-23, the Environmental Safety Health Audit Agency (ESHAA) conducted a green audit of the college in December, 2023.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the standard Green Policy adopted by different academic institution and the college itself. With this in mind, the specific objectives of the audit were to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the College is in compliance with the applicable regulations, policies and standards.

During the initial planning of the audit, an analysis was conducted in order to identify, predict, evaluate and prioritize the parameters associated with the environmental sustainability. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel considered key in the Environmental Management System (EMS) in the campus. The criteria and methods used in the audit were based on the identified impacts. The methodology used included physical inspection of the campus, review of the relevant documentation and interviews.

Acknowledgement

We would like to thank our Principal and Director of the Netaji Subhash Engineering College for their consent to conduct this audit. We would like to sincerely thank all the Departments, students, teaching and non-teaching staff for their kind cooperation with us during this survey.

Assurance

This audit has been conducted in accordance with the *International Standards for the Professional Practice of Internal Auditing*.

In our professional judgment, sufficient and appropriate audit procedures were completed and evidence gathered to support the accuracy of the conclusions reached and contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit with the established criteria.

1.0 Introduction

Green Audit can be defined as it is a systematic, documented, periodic, and objective review by regulated entities of facility operations and practices related to meeting environmental requirements. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

There is relationship between Green Audit and Sustainable Development of the any business organization. The primarily needs for achieving the sustainable development of the business are to determine the Green Audit policy, Green Audit Framework, Accurate implementation, and Result analysis of it. Strong Green Audit process can help to achieve the sustainability. Green Audit framework helps to achieve the goal set by an organization. Green Audit is linked to Sustainable development process. Green Audit and sustainable development process help to reduce the wastage and associated cost as well as increases the product quality.

Green audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

1.1 About the College

The Netaji Subhash Engineering College (NSEC) has been set up; keeping in mind the ideals of Netaji Subhash Chandra Bose, whose contribution to the Indian Freedom Movement remains invaluable forever. Netaji had dreamt of vibrant, strong and powerful India, an India which would be independent and self reliant, not only politically, but also in the spheres of Education & Technology. He strongly believed that true independence can only stem from strong base in education and technology.

His vision is our beacon and to give a concrete shape to his vision, we have set up Netaji Subhash Engineering College. We believe in his ideals that intelligent minds are the greatest resources in any walk of life. Our vision is to infuse young intelligent minds with cutting edge technical

education and help them to become matured professionals poised and ready to accept technical and managerial challenges in the global scenario.

Apart from 4 years B.Tech the Institute also offers 2 years Masters of Technology Programmes and 3 years Masters Programme leading to MCA, approved by Department of Higher Education, Govt. of West Bengal and All India Council for Technical Education (AICTE), Ministry of Human Resource Development, Govt. of India and affiliated to Maulana Abul Kalam Azad University of Technology, West Bengal (Formerly known as West Bengal University of Technology - WBUT).

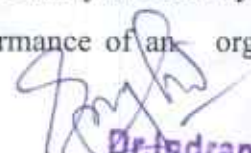
Netaji Subhash Engineering College, affiliated to Maulana Abul Kalam Azad university of Technology, made its humble beginning on 1998, for engineering degree course. The college is located on a beautiful campus of 3 acre (approx). The campus is located near New Garia Eastern railway station and Kabi Subhash Metro station. There are three buildings in the campus and each contains five floors. The total built up area is 14521.75 sq m.

The college is thinking about to adopt the 'Green Campus' system for environmental conservation and sustainability. There are main three pillars i.e. zero environmental foot print, positive impact on occupational health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO₂ emission, energy and water use, while creating an atmosphere where students can learn and be healthy. The college administration works on the several factors of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

1.2 Objectives of the Study

The main objective of the green audit is to promote the Environment Management and conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

1. Verifying compliance: Verifying compliance with standards or best available techniques.
2. Identifying problems: Detecting any leakage, spills or other such problems with the operations and processes.
3. Formulating environmental policy: Formulating the organization's environmental policy if there is no existing policy.
4. Measuring environmental impact: Measuring the environmental impact of each and every process and operation on the air, water, soil, worker health and safety and society at large.
5. Measuring performance: Measuring the environmental performance of an organization against best practices.

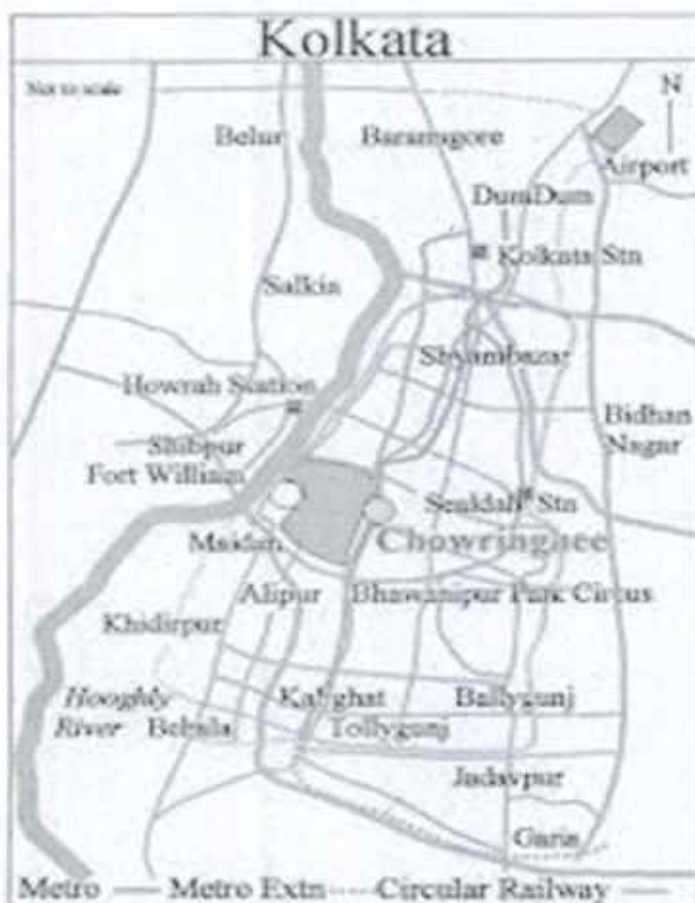

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6. Confirming environmental management system effectiveness: Giving an indication of the effectiveness of the system and suggestions for improvement.
7. Providing a database: Providing a database for corrective action and future plans.
8. Developing the organization's environmental strategy: Enabling management to develop its environmental strategy for moving towards a greener corporate and performance culture.
9. Communication: Communicating its environmental performance to its stakeholder's though reporting will enhance the image of the company.

1.3 General steps of Audit

1. Systematic and comprehensive data collection
2. Documentation with physical evidences
3. Independent periodic evaluation with regulatory requirements and appropriate standards
4. Systematic and comprehensive improvement and management of existing system


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1.4 The audit process

1.4.1 Pre-audit activities

The pre-audit activities include the following:

1. The sites / area /division that are to be audited need to be determined and selected.
2. The Audit Team was informed of the date of the audit enabled them to adjust and become used to the concept.
3. The audit scopes were identified. Audit Team was consulted when establishing the scope.
4. The audit plan was designed in such a way that it accommodated changes based on information gathered during the audit and effective use of resources.
5. Audit team and assignment of responsibility were established.
6. The required working papers were collected. This facilitated the investigations of audit team on the sites.
7. The background information on the facility including the facility' organisation, layout and processes, and the relevant regulations and standards, were collected.
8. The background information on the site's historical uses, and the location of soil and ground water contamination were collected.
9. The pre-audit questionnaire was informed to auditee.

1.4.2 Onsite audit activities

The onsite audit includes:

1. The opening meeting is the first step between the audit team and college authority. In this meeting the purpose of audit, the procedure and the time schedule were discussed.
2. Site inspection is the second step for onsite activity. In this step the audit team discovered matters which are important to the audit but which were not identified at the planning stage.
3. Onsite phase of the audit developed a working understanding of how the facility manages the activities that influence the environment and how any EMS, if there is one, works.
4. Assessed strengths and weaknesses, controls and risks associated with their failure were established.
5. Gathering audit evidence ie, collecting data and information using audit protocol.
6. Communicated with the Audit Team to obtain most information.
7. Evaluated the audit evidence against the objectives established for the audit.
8. An exit meeting to explain the audit findings.


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1.5 Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management
- Green Practices




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2.0 Water Audit

Evaluating the facility of raw water intake and determining the facilities for water treatment. Water harvesting is the best technique that can be adopted by simply storing water and use it at the time of scarcity.

2.1 Water Use

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

2.1.1 Observations

The study observed that Boring Well is the major source of water. Water is used for drinking purpose, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither by any leakages nor by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 2000 L/day, which include 1200 L/day for domestic purposes, 350 L/day for gardening and 450 L/day for different laboratories.

The work on rain water harvesting is under process.

2.1.2 Recommendations

- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/large scale reuse and recycle of water system is necessary.
- Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage are regularly serviced and the wastage of water is not below the industry average for such equipment's used in similar capacity.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.



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2.2 Audit Framework and detailed findings: Water management

Control objective	Control(s)	Audit Observation
Minimize consumption of water.	Repair sources of water leakage, such as dripping taps and showers as quickly as possible.	Regular checking and maintenance of pipelines are done to control water wastage.
	Install appliances which reduce water consumption	Practised as much as possible.
	Encourage a decrease in water usage among staff, students and conference guests	The college encourages decreasing the water usage among staff, students and conference guests because water consumption is minimal.
	Purchase the most efficient washing machines and dishwashers available which have an economy setting as default	No, college does not purchase the most efficient washing machines and dishwashers as these are not required by the college.
	Use an efficient and hygienic water storage mechanism is to minimize the loss of water during storage	College has water reservoirs. Water pumped from the bore well store there before the distribution. The reservoirs are cleaned in regular interval to maintain the hygiene.
	Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity	College has Water purifier with RO and large water filter with RO at the different strategic locations in the college for the students. All are with AMC.
	Install Water recycling mechanism, such as rain water harvesting system	It is under process.

3.0 Energy Audit

It deals with the energy conservation and methods to reduce the consumption and the related pollution.

3.1 Energy Conservation

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

3.1.1 Observations

Total energy consumption is determined as 20000 KWH/Year by major energy consuming equipment. All the departments and common facility centres are equipped with CFL/LED lamps. Approximately 1.54% (Capacity) of total consumption is measured during survey. Equipments like Computers are used with power saving mode. Also, campus administration runs switch –off drill on regular basis. In all the laboratories the switches were shut down after occupancy time and are one of green practices for energy conservation.

3.1.2 Recommendations

- Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.
- Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity.
- Installation of LED lamps instead of CFL.


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3.2 Audit Framework and detailed findings: Energy management

Control objective	Control(s)	Audit Observation
Reduce energy consumption, especially of energy derived from fossil fuels	Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.	No, the college does not have any choice of renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.
	Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity	The College have no choice other than <i>WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED</i> . The company is a PSU of govt of West Bengal. The company which invests Roof top Solar PV systems.
	Look in to the possibility of on-site micro-generation of renewable electricity.	No. Planned to be installed very soon.
	Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs	The College are using CFL/ LED as much as practicable.
	Provide energy efficient heating systems, with adjustable controls for individual heating appliances wherever possible, and ensure that comprehensible instructions are available to staff and students on the use of heating controls.	No heater is used even in winter season.
	Encourage staff, students and conference guests to save energy through visible reminders, incentives and information to increase awareness. This particularly	Misuse of electricity is controlled by turning off the appliances when not required.


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 Environment Safety Health
 Audit Agency (ESHAA)

	concerns turning off electrical appliances when not in use in both communal and residential rooms	
	Monitor and understand the importance of different sources of college energy consumption, and set appropriate and measurable targets for a reduction in certain areas of consumption and/or in the overall consumption of energy.	Disconnect the supply of electricity when not required.(Specially during the month long vacation).
	Conduct switch off drills at regular intervals	Yes
	Ensures that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available	All electronic and electrical equipment's are switched off when not in use. Equipments are configured in power saving mode when such option is available.
	If there are equipment's running on standby mode, reduce the energy consumption on standby mode or minimize the running of equipment's on standby mode	Equipment's running on standby mode.

4.0 Waste Management

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threat to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus. The different solid wastes collected as mentioned above.

4.11. Observations

The total solid waste collected in the campus is 16 Kg/day. Waste generation from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Segregation of chemical waste generated in Chemistry Laboratories is also practiced. Single sided used papers reused for writing and printing in all departments. Unimportant and non-confidential reports/papers are sent for pulping and recycling after completion of their preservation period. Very less plastic waste (0.05Kg/day) is generated by some departments, office, garden etc but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. Few glass bottles are reused in the laboratories.

4.1.2 Recommendations

- Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by Municipality and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Single sided papers to be used for writing and photocopy

4.2 Audit Framework and detailed findings: Waste Management

Control objective	Control(s)	Audit Observation
Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse	Reduce the absolute amount of waste that it produces from college staff offices.	No, the college have not used any controls to reduce the absolute amount of waste that it produces from staff offices.
	Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.	Yes. College uses the facilities provided by the local authority to recycle the wastes.
	Compost, or cause to be composted, all organic waste, green waste and un-recycled cardboard produced in or collected from kitchens, gardens, offices and rooms.	No. College has not waste composting facility.
	Recycle or safely dispose of white goods, computers and electrical appliances.	Safe disposal through authorized agents for computers and electrical wastes.
	Use reusable resources and containers and avoid unnecessary packaging where possible	College tries to use reusable resources and avoid unnecessary packaging where possible
	Always purchase recycled resources where these are both suitable and available.	College tries to purchase recycled resources where these are both suitable and available.
	Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated	Yes. College has sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated
	Make specific arrangements for events, such as cultural Events, internal and external seminars and conferences, where significant recyclable waste is likely to be produced, in order to both minimize the waste produced and maximize what is recycled/reused	Yes! College arranged the events with least production of waste.
	Promote reuse of items and waste recycling among staff, students and conference guests through training, posters and incentives	Yes!, the college has promoted reuse of items and waste recycling among staff, students and conference guests through training, posters and incentives.
	Promote reuse of items and waste recycling among staff, students and conference guests through training, posters and incentives	Yes, the college dispose all waste, whether solid or otherwise, in a scientific manner and ensure that it is not released directly to the environment.

5.0 E-waste Management

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. E-waste makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

5.1.E-waste Management System

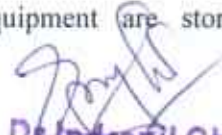
Electronic waste or e-waste is generated when electronic and electrical equipment become unfit for their originally intended use or have crossed the expiry date. Computers, servers, mainframes, monitors, compact discs (CDs), printers, scanners, copiers, calculators, fax machines, battery cells, cellular phones, transceivers, TVs, iPods, medical apparatus, washing machines, refrigerators, and air conditioners are examples of e-waste (when unfit for use).

E-waste typically consists of metals, plastics, cathode ray tubes (CRTs), printed circuit boards, cables, and so on. Valuable metals such as copper, silver, gold, and platinum could be recovered from e-wastes, if they are scientifically processed. The presence of toxic substances such as liquid crystal, lithium, mercury, nickel, polychlorinated biphenyls (PCBs), selenium, arsenic, barium, brominated flame retardants, cadmium, chrome, cobalt, copper, and lead, makes it very hazardous, if e-waste is dismantled and processed in a crude manner with rudimentary techniques. E-waste poses a huge risk to humans, animals, and the environment. The presence of heavy metals and highly toxic substances such as mercury, lead, beryllium, and cadmium pose a significant threat to the environment even in minute quantities.

Consumers are the key to better management of e-waste. Initiatives such as Extended Producer Responsibility (EPR); Design for Environment (DfE); Reduce, Reuse, Recycle (3Rs), technology platform for linking the market facilitating a circular economy aim to encourage consumers to correctly dispose their e-waste, with increased reuse and recycling rates, and adopt sustainable consumer habits.

5.1.1 Observation

E-waste generated in the college is very less in the institute. It is handled, treated and disposed in scientific way. There are 1000 computers (with TFT monitors), 40 printers, 15 scanners, 04 photo copiers and 05 photocopy-cum- printer-cum-scanners are available in the college. The college generates some e-waste like chips, bulbs, circuit boards, mother boards, computers, batteries, relays, and switches. The college has practice of paperless office work administration and as a result there is less carbon emission from printers, no carbon copy of bills, filing of cartridge outside the office (if necessary) is observed. The non-working computers, spare parts and other non-working electrical equipment are stored in


Dr. Indranil Ghosh
 Environment Safety Health
 Audit Agency (ESHAA)

separate places. The college has intention to adopt the Buyback policy. E-waste handled is 80 kg (approx) per year and disposed off through authorized vendors.

5.1.2 Recommendations

- Recycle or safely dispose of white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible. Always purchase recycled resources where these are both suitable and available.

5.2 Audit Framework and detailed findings: E Waste Management

Control objective	Control(s)	Audit Observation
Reduce the E waste generation	Adoption of Extended Producer Responsibility (EPR). The EPR is an environment protection strategy that makes the producer responsible for the entire life cycle of the product, especially for take back, recycle and final disposal of the product.	College has no specific policy for E waste management.
	Adoption of paperless office to reduce E waste.	Yes! College has implemented paper less office partially.

6.0 Green area Management Audit

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programs.

6.1 Green Area

Green spaces are important reservoirs of biodiversity, providing resources, ecosystem services and habitats for species of interest, improving functional and structural connectivity at the urban level

6.1 Observations

Around 6000sq m (approximately) land is available as green area. Campus is located in the vicinity of different types (species) trees. Various tree plantation programs are being organized at college campus. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among local people. The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.

Following plants are available in the college:

6.1.2 Recommendations

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.

6.2 Audit Framework and detailed findings: Green Area Management

Control objective	Control(s)	Audit Observation
Development of green area to compensate CO ₂ .	Proper Land use pattern to develop green area.	No. There is no proper land use policy of the college.
	Proper Taxonomical identification of plants in the campus.	Yes, there is taxonomical identification of the plants.
	Conduct Environment Awareness program.	Environment Awareness program regularly organized by the college authority.

6.3 Taxonomical identification of plants in the campus

1. Coroton: *Croton californicus*
2. Hejing tagar: *Tabernaemontana divaricata*
3. Golap: *Rosa rubiginosa*
4. Gulmohor: *Delonix regia*
5. Bel: *Aegle marmelos*
6. Jui: *Jasminum sambac*
7. Tecoma: *Tecoma stans*
8. Erika palm: *Dyopsis lutescens*
9. Ponsetia: *Euphorbia pulcherrima*
10. Cycus: *Cycas revoluta*
11. Jhau: *Tamarix dioica*
12. Joba: *Hibiscus sabdariffa*
13. Sunflower: *Helianthus annuus*
14. Elamunda: *Allamanda cathartica*
15. Musanda: *Mussaenda erythrophylla*
16. Kunda: *Jasminum multiflorum*
17. Rangan: *Ixora coccinea*
18. Bogenvelia: *Bougainvillea spectabilis*
19. Champa: *Plumeria rubra*
20. Nayantara: *Catharanthus roseus*
21. Christmas tree: *Araucaria heterophylla*
22. Phonix palm: *Phoenix canariensis*
23. Gandharaj: *Gardenia jasminoides*
24. Kamini: *Murraya paniculata*
25. *Phycus benzenium*
26. Mango: *Mangifera Indica*
27. Ashfol: *Euphoria longana*
28. Guava: *Psidium guajava*
29. Neem: *Azadirachta indica*
30. Pomelo: *Citrus maxima*
31. Patilebu: *Citrus limon*
32. Amloki: *Phyllanthus emblica*
33. Madhobi: *Combretum indicum*

7.0 Green Practices

"Going green" means to pursue knowledge and practices that can lead to more environmentally friendly and ecologically responsible decisions and lifestyles, which can help protect the environment and sustain its natural resources for current and future generations.

Green Practice includes

1. Green purchasing
2. Green transportation
3. Treatment of chemical waste
4. Campaign for Go Green
5. Green Policy

Control objective	Control(s)	Audit Observation
Ensure that improvements, purchases and developments are environmentally sound	Seek and act upon professional advice in order to minimize the adverse environmental impact of any new developments and exceed government regulatory requirements. This includes efficient heating and water systems, appropriate space for recycling, and the use of recycled and/or sustainable building materials where possible	No
	Purchase efficient and environmentally sound appliances	College is positive about increasing greenery by planting in front of the college and maintaining potted plants scientifically as much as possible.
	Purchase food that has been produced and delivered with minimal impact on the environment, this includes buying locally produced, organic and free range food wherever possible	No, college does not purchase food stuff regularly as the canteen is in full swing.
Minimize the use of unsustainable transport	Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staff and students.	The college is well connected with good surface transport. Faculty members, Office staffs and students are attending the college by public transport or by own transport

		like Bicycle, motor cycle etc., College provides pick up and drop facility to the faculty members and other staffs from the a suitable point.
	Reduce the proportion of travel on College business carried out in private transport and eliminate unnecessary and inefficient use of college vehicles	No, college has no vehicle. It hires vehicles from the vendors. College uses hired vehicle for the faculty trip and other official works.
	Promote car sharing / car pool among the students and faculty members	Students use either public transport or own vehicle.
Minimize the use of chemical pollutants	Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations	Negligible amount of washing liquids are used in the college and all the toilet cleaners are Eco friendly.
	Dispose the chemical waste generated from the laboratories in a scientific manner	Different routine experiments are conducted as per the curriculum and there is no toxic chemical used in the chemistry laboratory which may lead to the generation of different chemical pollutants. The wastes which are generated are collected and disposed separately. After collecting separately they are diluted and safely disposed to large water bodies through normal sewerage system. (Usually make it more dilute by addition of water to avoid bio magnification).
	Reduce the practice of burning Plastic and other material that emits harmful gas on burning is prevented in the campus.	Use of plastic is strictly restricted.
	Establish a Garden in the campus	The college has already maintained garden.
	Minimize the use of fertilizers and pesticides in college grounds, opting for the use of compost produced on site	Negligible amount of fertilizers and pesticides are used in the college.

GREEN AUDIT REPORT OF Netaji Subhash Engineering College, 2022-23

	wherever possible	
	Encourage the faculties and students to plant trees in the garden.	Faculty members and students know the importance of the tree plantation.
	Reviews periodically the list of trees planted in the garden	No such review conducted.
Ensure that environmental awareness is created	Conduct environmental awareness workshops as a part of the program.	Yes!
	Conduct events such as plant trees to spread environmental awareness among the students	College students usually do that through the NSS unit of the college.
	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	Yes
	Reduce the rate of contributes to the depletion and degradation of natural resources	College does not directly or indirectly involve in depletion and degradation of natural resources.
	Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service	As per the UGC guidelines of NEP and the syllabus framed by the university the subject Environmental Science has introduced in the curriculum of all the streams.
Ensure that the buildings conform to green standards.	Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission	No constructions are in compliance with green standard.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy	Eco Cultural Club of the college takes the responsibility.
	Ensure that on the Nature Club there will be appropriate representatives of the relevant college departments and authorities – such as catering, gardening, maintenance,	Eco Cultural club of the college is involved in this task.

Dr. Indrani Ghosh
Environment Safety Health
Audit Agency (ESHAA)

	cleaning and finance	
	Ensure that on the Environmental Committee there will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact	The college has no such Green Officer.
	Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will monitor progress and set measurable targets wherever possible	Environmental Cell of the college takes the responsibility.
	Ensure that the Environmental Policy is enforced regardless of whether its requirements exceed the mandate of the law	Environmental policy available.
	Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice	Every staff and student member recognizes their responsibility to ensure that the commitments to the Environment.
	Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings	Green audit is conducted annually.

Recommendations

- College should formulate Environmental management policy/ Green policy to achieve the sustainable development
- The Environmental Protection Committee should be empowered to look after all the green practices in the college
- More Seminar/ workshop should be organized to create the awareness of Environmental conservation among the students and other stake holders.

Conclusions

Considering the fact that the institution is predominantly an under-graduate college, there is significant concern over the environmental conservation both by faculty and students. The environmental awareness initiatives are substantial. The installation of solar panels and paperless work system are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using Eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development.

As part of green audit of campus, we also carried out the environmental monitoring of campus includes Illumination, Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus well within the limit i.e. below 50 dB at day time.


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Environment Safety Health
Audit Agency (ESHAA)

A] Expand awareness campaigns and educational initiatives to promote broader participation in environmental conservation efforts.

1. Celebration of Earth day, 2023

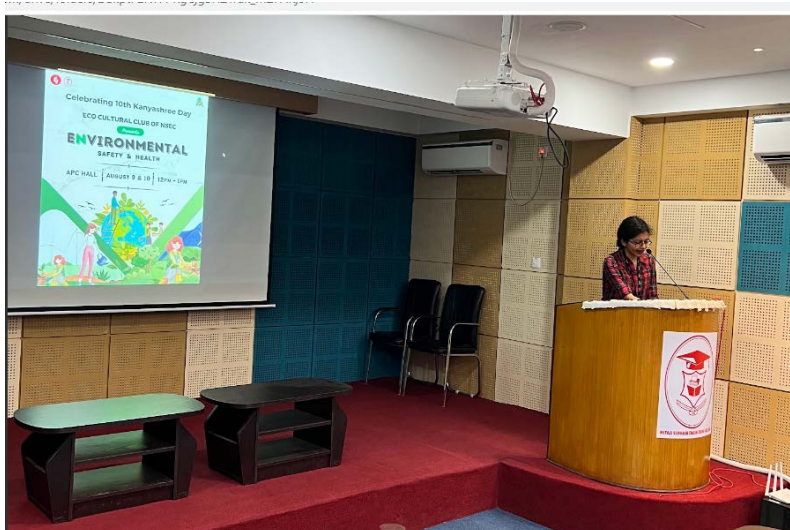
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2.



Earth Day 2023 at Netaji Subhash Engineering College, organised by the Eco Cultural Club of the college, was a impactful initiative for environmental sustainability. The even focused on tree planting across the campus. Documented information is available.

3. Awareness program on Environmental Safety and Health



The Environmental awareness program 2023 at NSEC, led by the Eco Cultural club was a powerful testament to the college's commitment to environmental stewardship and cultural diversity. Documented information is available.

Strengthen partnerships with external organizations and stakeholders to leverage resources and expertise for enhanced impact.

4.

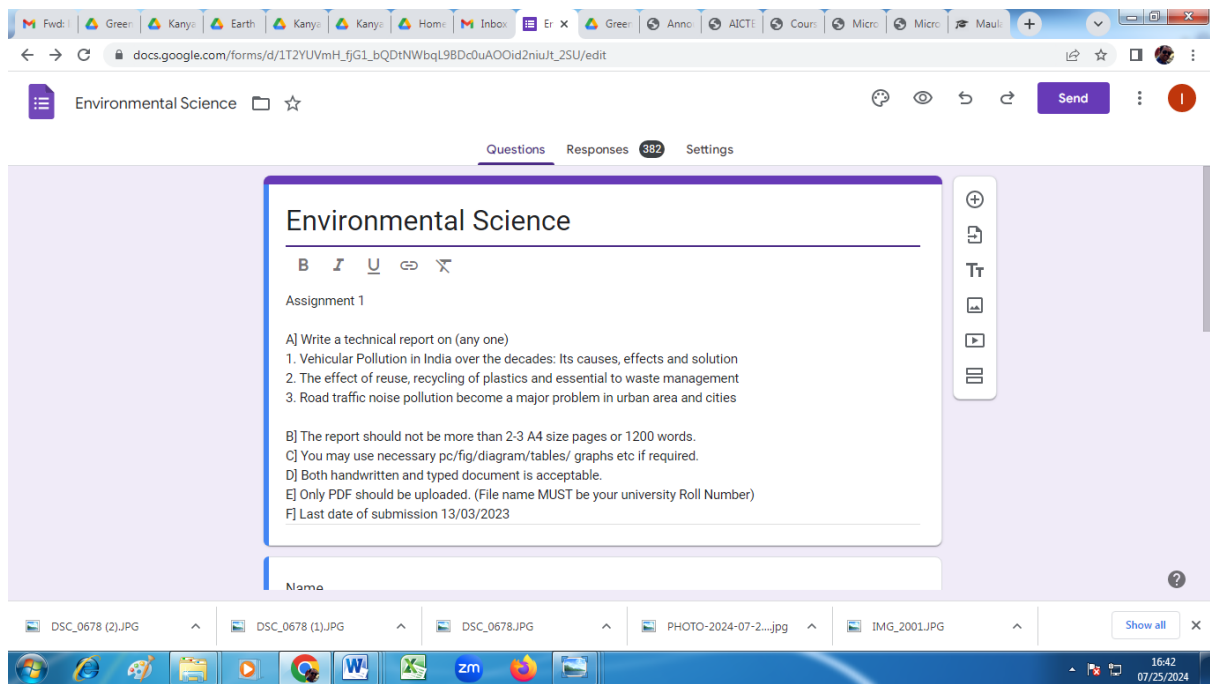


The formation of Greenovation club with collaboration with SWITCH ON Foundation was a new initiative to the Sustainable development from the college end. The aim is to make people aware to lessen our ecological footprint while fostering sustainable lifestyles and business practices for long-term planetary health. Documented information is available.

Integrate sustainability principles into academic curricula to foster a culture of environmental responsibility among students and faculty.

Courses offered under MAKAUT curriculum for B Tech Students

- a) B Tech CSE : Environmental Science (MC 401)
- b) B Tech IT : Environmental Science (MC 401)
- c) B Tech CSBS : Environmental Science (MC 401)
- d) B Tech AIML : Environmental Science (MC 401)
- e) B Tech ECE : Environmental Science (MC 381)
- f) B Tech AEIE : Environmental Science (MC-ES301)
- g) B Tech BME: Environmental Science & Safety (MC – ES 501)
- h) B Tech CE : Environmental Engineering –I/II [CE(PC)402/ 505]



The purpose of inclusion of Environmental Science in the curriculum is to allow individuals to explore environmental issues, engage in problem solving, and take action to improve the environment.



NETAJI SUBHASH ENGINEERING COLLEGE

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