



NETAJI SUBHAS UNIVERSITY

# ENERGY AUDIT REPORT 2023 - 2024




## Executive Summary

The Netaji Subhas University initiative to conduct a Green Audit of its campus is a commendable step toward sustainable development. The strategies involved included the preparation of questionnaires and subsequent action plans to implement the project.

The Green Audit aligns with Criteria 7 of the National Assessment and Accreditation Council (NAAC), an autonomous organization in India that grades institutions as Grade A, Grade B, or Grade C based on their accreditation scores.

The Green Audit aimed to analyze the environmental practices within the campus, which affect the university's eco-friendly ambiance. The primary goal of the Green Audit is to secure best practices for environmental sustainability, thereby reducing potential health hazards and threats to students. The audit helps ensure compliance with various environmental management norms and standards and identifies protocols to develop a sustainable ecosystem on campus.

Questionnaires for the Green Audit were prepared based on guidelines, rules, acts, and formats set by the Government of India, the Ministry of Environment and Forest, New Delhi, and the Central Pollution Control Board, New Delhi. These questionnaires covered aspects such as solid waste, energy, water, hazardous waste, and e-waste. For the audit, suitable data analysis required the study area to be grouped into various Blocks and Departments. The audit examined areas including solid waste, electricity and energy, water and wastewater, illumination, noise levels, and green inventory. It also highlighted the green initiatives undertaken by the university to conserve environmental resources.

  
**Registrar**  
Netaji Subhas University  
Jangshedpur, Jharkhand

# CERTIFICATE

## PRESENTED TO

### NETAJI SUBHAS UNIVERSITY

ASSESSED BY CENTRE FOR ENVIRONMENT AND LIFECARE FOR THE  
COMPREHENSIVE STUDY OF ENVIRONMENTAL IMPACTS ON INSTITUTIONAL  
WORKING TO FULFIL THE REQUIREMENT OF

## GREEN AUDIT

THE GREEN INITIATIVE CARRIED OUT BY THE INSTITUTION HAVE BEEN VERIFIED  
ON THE REPORT SUBMITTED AND WAS FOUND TO BE SATISFACTORY,

THE EFFORTS TAKEN BY THE MANAGEMENT AND THE FACULTY TOWARDS  
ENVIRONMENT AND SUSTAINABILITY ARE APPRECIATED AND NOTEWORTHY



SIGNATURE

02/06/2024 - 16/06/2024  
DATE OF AUDIT





# 1.0 Introduction

## 1.1 Need for Green Audit

A Green Audit is a systematic process involving the identification, quantification, recording, reporting, and analysis of components of environmental diversity. It aims to evaluate environmental practices both within and outside the concerned sites, impacting the eco-friendly ambiance. The steps involved in a Green Audit include water audit, waste disposal audit, energy audit, and environmental quality audit, which covers illumination and noise levels on campus. By analyzing the audit reports, universities can recognize cost-effective waste management methods, promote an enhanced learning ecosystem, and strive for top accreditation grades. Additionally, it bolsters the university's credibility and branding.

## 1.2 Objectives of the Audit

The main objective of the Green Audit is to assess current sustainability practices concerning natural resource use, energy utilization, waste generation, and management in an environmentally friendly manner. The audit focuses on establishing a baseline of existing environmental conditions, emphasizing the natural and physical environment. It aims to raise awareness among students and staff about environmental issues and sustainability, document baseline data of good practices, and provide strategies and action plans for improving future environmental quality.

## 1.3 Green Audit Process

1. Understand the scope of the audit.
2. Analyze the strengths and weaknesses of the internal environment.
3. Conduct the audit.
4. Evaluate the observations of the audit program.
5. Prepare a report documenting the observations.

## 1.4 Benefits of Green Audit

- **Cost Savings:** Identifies cost-saving methods through waste minimization and management strategies.
- **Problem Identification:** Highlights existing and potential environmental issues.
- **Enhanced Environmental Performance:** Enables organizations to improve their environmental performance.
- **Increased Awareness:** Raises awareness of environmental guidelines and responsibilities.



## 1.5 Methodology of Green Audit

- Formation of the core team for the Green Audit and conducting a kick-off meeting and discussions.
- Primary data collection of energy, water, and solar plant details, as well as monitoring environmental parameters such as noise levels and illumination.
- Analysis and representation of the collected data.

## 1.6 Audit Participants

### On behalf of NETAJI SUBHAS UNIVERSITY :

Sl No	Name	Position
1	Prof. (Dr.) Acharya Rishi Ranjan	Pro-VC
2	Mr. Nagendra Kumar	Registrar
3	Mr. Ranjan Kumar Mishra	Director IQAC , Dean Academic
4	Dr. Pramod Kumar Singh	Dean Research
5	Dr. Vijay Kant Pandey	HOD Agriculture
6	Mr Nazeem Khan	Dean Administrator
7	Dr. Jyoti Prakash Swain	Principal Education
8	Mr Mojesh Ashraf	Exam Controller
9	Mr Tanveer Alam	Admission Head, Deputy Registrar

### On behalf of Center for Environment and Life Care:

Sl No	Name	Position	Qualifications/Experience
1	Ajit Kumar Singh	Lead Auditor	M.Sc., PGDEPCT, PGDEMS, Lead Auditor ISO 14001: 2015, 20 years' experience in EMS & Compliance.
3	Shubhro Praksh das	Co-Auditor	Bachelor in political science, MSW
3	Dipak Soni	Co-Auditor	Post graduate in Environment Management; Project Manager. Working in social and environment sector last 5 years.

## **1.7 Onsite Visit**

The Green Audit was conducted with the help of co-associates, involving various student groups, teaching, and non-teaching staff. The audit began with a kick-off meeting with the core team, followed by teams walking through all the facilities. They determined the various utility patterns, waste management practices, and environmental parameters. Staff and students were interviewed to gather details

on usage, frequency, and general characteristics of environmental parameters. Data collection covered sectors such as energy, waste, green areas, and water use. College records and documents were verified multiple times to ensure the accuracy of data obtained through surveys and discussions.

## **1.8 Focus Group Discussion**

Pre-audit discussions focused on the scope and objectives of the audit, considering the green initiatives already taken and the current scenario of the college campus. This meeting was a crucial step for the Green Audit as it was the first opportunity to understand concerns and gather information for the audit team to review before the onsite visit. The audit protocol and plan were distributed and discussed during this meeting. The necessary documents were collected from the college prior to the start of the audit processes. During this meeting, the audit team was selected with the help of staff and college management. The pre-audit meeting ensured successful planning and coordination of the audit processes.

## **1.9 Management Commitment**

The management of the college has demonstrated a strong commitment to green auditing during the pre-audit meeting. They are prepared to encourage and support all green activities. Following the green audit, the management plans to promote various environmentally friendly initiatives, such as awareness programs on environmental issues, campus farming, and planting more trees on the campus. They are also willing to formulate policies based on the green audit report to ensure ongoing environmental sustainability.

## **2.0 About NETAJI SUBHAS UNIVERSITY**

The importance of Values and Morals is sky-high when it comes to talking about the NETAJI SUBHAS UNIVERSITY. We, at IFE give a lot of prominence to virtues like honesty, diligence, courtesy, punctuality and respect towards women. Moral is the life-line of the body called Character. Someone has rightly said, "If you lose money, you lose nothing. If you lose health, you lose half. And, if you lose character, you lose everything." Through moral values, we at IFE impart quality education and try to develop an individual to become an unbiased leader who values courage and truth.

## 2.1 Focus

Netaji Subhas University (formerly named as Netaji Subhas Institute of Business Management) was established under the Government of Jharkhand Act 11, 2018 to confer the status of Private University under incorporation of Netaji Subhas University Act 2018 and approved under Section 2(f) of UGC Act 1956. Netaji Subhas University is a unit of Sitawanto Devi Mahila Kalyan Sansthan, a non-profitable organisation tirelessly serving in the fields of health and education since 1998 in the remote areas of Jharkhand and Bihar with headquarters in Jamshedpur (known as the first steel city of India) Jharkhand. Thus, the month of September 2018 heralds the transformation of the nomenclature of NSIBM to NSU having a lush green campus of 25.42 acres. The University offers 7 Diploma, 23 Under Graduate, 13 Post Graduate & 13 PhD programmes in the fields of Management, Commerce, Education, Law, IT, Arts and Humanities, Pharmacy, Hotel Management, Nursing, Science having enrolment of around 4421 students. Netaji Subhas University is the first Private University of the scheduled area notified by the President of India in Gazette in consultation with state of Jharkhand Governor vide letter no. – 19(8)/2006-leg. –I dated 11th April 2007. The prime focus of the university is on quality education and employability, which has helped us in locating our name into a leading Premier university in a short span of its establishment.

NSU believes in core values of INTEGRITY, RESPECT, COURAGE and EXCELLENCE. To inculcate these core values, we have worked hard and achieved new heights as well as established ourselves best in the field of quality education, Research, Innovation, Curriculum up gradation and infrastructure development. The University believes in the motto of “I Can & I Will”, “Believe in you”, “Make today Magical” and has dedicated itself to remain Locally Engaged and Prepare “Youth for Tomorrow”.

## 2.2 Vision & Mission

### 2.2.1 Vision

- To uphold and stick to the quality education and continuously striving towards creating new dynamics in knowledge sharing through constant learning.
- To work on the Innovations in education and teaching methods, up gradation of syllabus and courses as per the changing scenario, training, and learning, including online learning, blended learning, and such other modes and also to work on the integrated and wholesome development of personality of our students.



- To work on the Interdisciplinary studies and courses, which would help our students to sustain and cope up in the changing perspective of Academics.
- To work on the inculcation of National integration, social as well as gender equality and ethics among our students.
- “To strive for the empowerment of women through higher education”
- Focusing on women empowerment as the prime concern, the college strives for holistic education, which includes in its purview, the multifold development of the students and their sensitization towards the complex socio-cultural matrix of the nation, thereby creating responsible citizens who can be leaders and participants in nation-building.

## **Mission**

- To establish our campus as a hub of Knowledge and our name as one of the best University in the State.
- To build leadership skills and groom our students to see them at the higher posts at different levels in the near future.
- To empower learners to achieve personal, professional and social goals.
- To craft learning with the highest human values and ethics.
- To achieve excellence in teaching and research.
- To practice Ethics, Dignity & Honour in the field of Academics.
- To impart knowledge through a learner-centric approach
- To provide holistic development by honing life skills in students.
- To uplift the first-generation learners of the scheduled area/tribal area by helping them overcome social and economical challenges.
- To ensure the employability in keeping with present technological and academic demand as per NEP 2022.
- To install an inclusive consciousness towards nation-building.

## **2.2 Geographical Location**

Pokhari, Near Bhilai Pahadi, Jamshedpur, Jharkhand

### **2.2.1 Buildings/Blocks**

#### **Block A**

- Chandrashekhar Azad Block
- Sukhdev Block
- Raj Guru Block
- Khudiram Bose Block
- Shaheed Bhagat Singh Block
- Veer Savarkar Block
- Bal Gangadhar Tilak Block
- Dr. APJ Kalam Block

### **2.2.2 Facilities Available in the College**

Netaji Subhas University is the premier and one of the best University in Jharkhand, with a venerable legacy, highest academic standards, diverse educational programmes, distinguished faculty, illustrious alumni, varied co-curricular activities and modern infrastructure which stands as the pride of Jharkhand and Eastern India. This is also one of the best University in Jamshedpur which emerges as a symbol of excellence, integrity and openness of manasa (thought), vacha (speech) and karmana (action).

Sri. Madan Mohan Singh, the Chancellor of the University, realising the importance of distinguished faculties to act as role models, relentlessly searched for talent all over the country and roped in people of eminence for this University.

The University today is proud of its infrastructure and services provided to both the students and staffs. The Central Library facilitates the teachers, the Research scholars and the students of the University for acquiring and researching on various educational subjects, which are immensely supported by the books and journals available to them. The books and journals available in the library are the edited and updated version by both Indian and International authors. The University has fiber-optic network in the campus connecting different departments with one another. The campus now spreads over 25 acres of lush in green hilly terrain, pollution free environment, and the buildings in the campus blend attractively with the beautiful natural surroundings.

## COURSES

The college offers a diverse range of courses to cater to different academic interests and career aspirations. These programs are designed to provide students with a strong foundation in their chosen fields, combining theoretical knowledge with practical experience to prepare them for future professional challenges.



### Graduate Programs

- ▶ B.Tech in Computer Science & Engineering
- ▶ B.Tech in Civil Engineering
- ▶ B.Tech in Mechanical Engineering
- ▶ B.Tech in Electrical & Electronics Engineering
- ▶ B. Sc in Physics
- ▶ B. Sc in Mathematics
- ▶ B. Sc in Chemistry
- ▶ B. Sc in Botany
- ▶ B. Sc in Zoology
- ▶ B. Sc in Agriculture
- ▶ B. Sc in Data Science
- ▶ B.Sc Biotechnology
- ▶ B.Sc in Hotel Management
- ▶ B.Sc Nursing
- ▶ BCA
- ▶ B.A
- ▶ BA in Journalism & Mass Communication
- ▶ BBA
- ▶ BBA LL.B(Hons.)
- ▶ LL.B
- ▶ B.Ed
- ▶ B.Com
- ▶ B. Pharm



### Post Graduate Programs

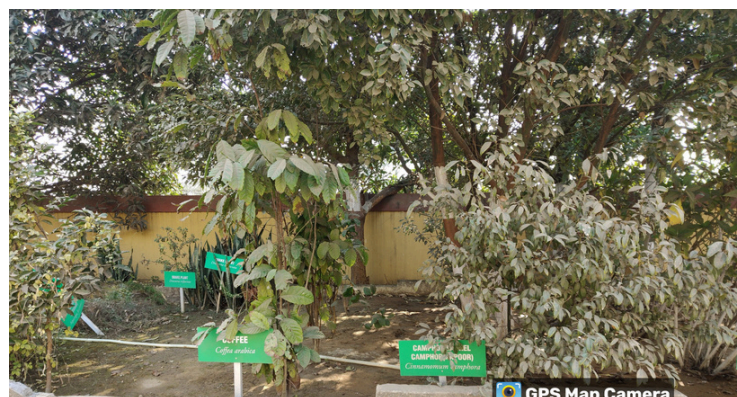
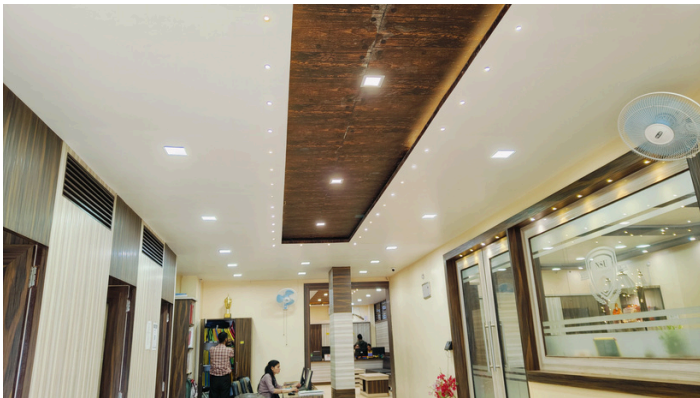
- ▶ M. Sc in Physics
- ▶ M. Sc in Chemistry
- ▶ M. Sc in Mathematics
- ▶ M. Sc in Botany
- ▶ M. Sc in Zoology
- ▶ M.Sc Microbiology
- ▶ M.A
- ▶ M.Pharm Pharmacognosy
- ▶ M. A in Education
- ▶ MA in Mass Communication & Journalism
- ▶ LLM (Master of Law)
- ▶ M.Com
- ▶ MBA
- ▶ MCA
- ▶ M.Pharm Pharmaceuticals



### Diploma Programs

- ▶ Diploma in Computer Science & Engineering
- ▶ Diploma in Civil Engineering
- ▶ Diploma in Mechanical Engineering
- ▶ Diploma in Electrical & Electronics Engineering
- ▶ D. Pharm
- ▶ ANM (Auxiliary Nurse And Midwife)
- ▶ GNM (General Nursing and Midwifery)





## NETAJI SUBHAS UNIVERSITY (NSU), JAMSHEDPUR

### 3.0 Green Audit

#### 3.1 Questionnaires

Sl No	Audit Questions	Answers/Remarks
1.1	<b>General information</b>	
1	Does any Green Audit conduct earlier?	YES
2	What is the total strength (people count) of the University?	1942
3	What is the total number of working days of your campus in a year?	210
4	Where is the campus located?	Village – Pokhari P.S–Mango, Jamshedpur
5	Municipal waste, Sewer line, waste water managed by?	<p>Municipal waste in the college are effectively managed through a systematic approach. Waste is segregated at the source and then sent for recycling and Food waste is used in Biogas Plant. Sanitary waste is disposed of responsibly through incineration.</p> <p>No Sewer line, as it is under Gram Panchayat.</p>



Sl No	Audit Questions	Answers/Remarks
1.2	<b>WASTE MINIMIZATION AND RECYCLING</b>	
1	Does your University generate any waste? If so, what are they?	Solid waste.
2	What is the approximate amount of waste generated per day? (in KG approx.)	15 kgs
3	How is the waste generated in the University managed? By Composting, Recycling, Reusing, Others (specify)	<ul style="list-style-type: none"> <li>• Single use plastic is banned on the campus.</li> <li>• Composting is done for horticulture waste management.</li> <li>• Solid waste (Both dry and wet) is Segregated.</li> <li>• Paper waste is sent to scrap vendor periodically.</li> <li>• signed MOU with Koru Foundation for Recyclables and Hulladek for E-WASTE.</li> </ul>
4	Do you use recycled paper in University?	YES NETAJI SUBHAS UNIVERSITY COLLABORATES WITH THIRD PARTY RECYCLE VENDOR.
5	How would you spread the message of recycling to others in the community?	<ul style="list-style-type: none"> <li>• Seminars and webinars for students and faculty.</li> <li>• Nukkar-Natak by Students to increasing awareness.</li> <li>• Various campaigns for awareness are organised by NSS team.</li> </ul>



SI No	Audit Questions	Answers/Remarks
<b>1.3</b>	<b>GREENING THE CAMPUS</b>	
1	Is there a garden in your University?	Yes
2	Total number of Plants in Campus?	~ 300 , Full Grown Trees, Small Trees, Hedge Plants.
3	How many Tree Plantation Drives organized by campus per annum?	Yes. 3+ plantation drives in last years.
4	Is there any Plant Distribution Program for Students and Community?	Yes

SI No	Audit Questions	Answers/Remarks
<b>1.4</b>	<b>WATER AND WASTEWATER MANAGEMENT</b>	
1	Sources of water	Ground water.
2	Water usage details.	Drinking, Gardening, Kitchen & Toilets.
3	How does your University store water? Are there any water saving techniques followed in your University?	Sump tank and Overhead Water tanks.

### 3.2 Data analysis and final report preparation

Proper analysis and presentation of data produced from work are vital elements. In the case of a green audit, the filled questionnaires from each group's survey were tabulated according to their modules in Excel spreadsheets. This tabulated data was then used for further analysis. To enhance understanding and avoid complications, averages and percentages were calculated. Graphical representations of these results were created to provide a quick overview of the status. The overall outcomes were interpreted by incorporating all primary and secondary data, references, and interrelations. This interpretation was used to prepare the final report.

The study covered the following areas to summarize the current status of environmental management on the campus:

As part of the green audit, the Green Audit Assessment Team conducted environmental monitoring of the campus, including illumination and noise levels in the classrooms. It was observed that the illumination and ventilation are adequate, considering natural light and air velocity. Additionally, noise levels on the campus are well below the permissible limits.

#### 3.2.1 Air Quality:

The air quality is monitored by the local authorities of the township. The campus is located in Jamshedpur. The air quality index (AQI) forecast for Jamshedpur is as follows:

Pollution level	Wind
Moderate 90 AQI	13.5 km/h

### 3.2.2 Illumination level

To improve the educational environment, classrooms need good lighting. Good lighting makes students feel safe and enhances learning. Additionally, it strengthens the school's brand value. Many studies have shown a close relationship between lighting and student performance.

A light level of 250 lux is sufficient in classrooms where students spend most of their time and focus on learning. To draw attention to the area where the teacher is located and to enhance students' concentration, a light level of **750 lux** can be used in that area. An illumination study was conducted in different classrooms, with values ranging from **350 to 600 lux**.





### 3.2.3 Noise Level

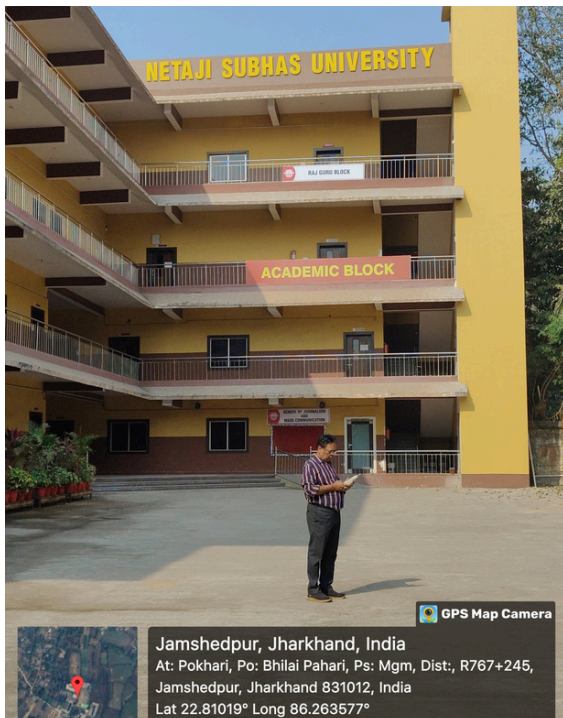
The human ear is constantly bombarded by man-made sounds from all directions, and there are few places in populated areas where relative quiet prevails. Sound has two basic properties: loudness and frequency.

**Loudness** is the strength of the sensation of sound perceived by an individual. It is measured in decibels (dB). For example, a whisper is about 20 dB, a library is around 30 dB, normal conversation ranges from 35-60 dB, heavy street traffic is about 60-70 dB, boiler factories are around 120 dB, jet planes during takeoff reach about 150 dB, and a rocket engine is about 180 dB. The loudest sound a person can endure without much discomfort is around 80 dB. Sounds beyond 80 dB can be considered pollutants as they harm the hearing system. The World Health Organization (WHO) has set 45 dB as the safe noise level for a city, while international standards consider up to 65 dB tolerable. Loudness is also expressed in sones, with one sone equaling the loudness of a 40 dB sound pressure at 1000 Hz.

**Frequency** is defined as the number of vibrations per second and is denoted in **Hertz (Hz)**.

A Lutron noise level meter was used to measure the noise levels at different locations on the university campus.

Sl No	Locations	Sound level (dB)
1	At court yard of college at Pokhari	64dB
2	At Main Gate at NETAJI SUBHAS UNIVERSITY	66 dB
3	Teachers common room at NETAJI SUBHAS UNIVERSITY	64 dB
4	In office entrance area at NETAJI SUBHAS UNIVERSITY	68 dB



## NOISE LEVEL MONITORING AT NETAJI SUBHAS UNIVERSITY



### 3.2.4 Water management

Water is one of the most crucial elements in our environment. At the university, water is primarily used for drinking, cleaning, gardening, food preparation, recreational purposes, laboratories, and bathrooms.

Water quality testing is vital because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can lead to severe illness or even death. Therefore, it is essential for NETAJI SUBHAS UNIVERSITY to ensure that drinking water is safe, clean, and free from bacteria and disease. Water quality parameters are determined by the intended use, with a focus on water treated for human consumption or environmental purposes.

The NETAJI SUBHAS UNIVERSITY uses ground water . The buildings are connected, and storage tanks are installed on top of the buildings. Approximately eight tanks, each with a capacity of 2000 liters, are installed.

The college's water quality is regularly analyzed by an RO technician using a TDS meter to ensure safety and standards. The daily water consumption on campus is approximately 6,000 liters, which is carefully monitored to maintain optimal usage and sustainability.







## NETAJI SUBHAS UNIVERSITY : SUMP TANK, OVERHEAD TANKS, AND DRINKING WATER FACILITIES





**FIRE HYDRANT NETAJI SUBHAS UNIVERSITY**

### 3.2.5 Drinking water

The water used for drinking purposes is clean and well-maintained. A total of three RO units are installed on the campus, ensuring safe drinking water is available on all floors of the university.

#### Water Quality Assessment

Water samples from NETAJI SUBHAS UNIVERSITY were collected and analyzed for quality parameters. The major parameters analyzed include color, pH, total dissolved solids, and total suspended solids.

#### Microbial Analysis Worldwide

water-borne infections are a major contributor to illness and fatalities. Routine microbiological testing of drinking water sources, recreational waters, and environmental waters is essential for protecting public health.



## WATER SOURCES AND RO WITH WATER COOLERS AT NETAJI SUBHAS UNIVERSITY



### 3.2.6 Rain Water harvesting system

The campus is equipped with a rainwater harvesting system featuring Rain water harvesting filters and recharge pits strategically placed throughout the premises. These units efficiently collect rainwater from rooftops and channel it into recharge wells, helping to replenish the groundwater level. The soak pits dispersed across the campus enhance the absorption of rainwater, promoting sustainable water management and reducing reliance on external water sources while ensuring a consistent groundwater supply. The harvested water is used for various purposes such as gardening, car washing, and toilet flushing, reducing the demand on municipal water sources.



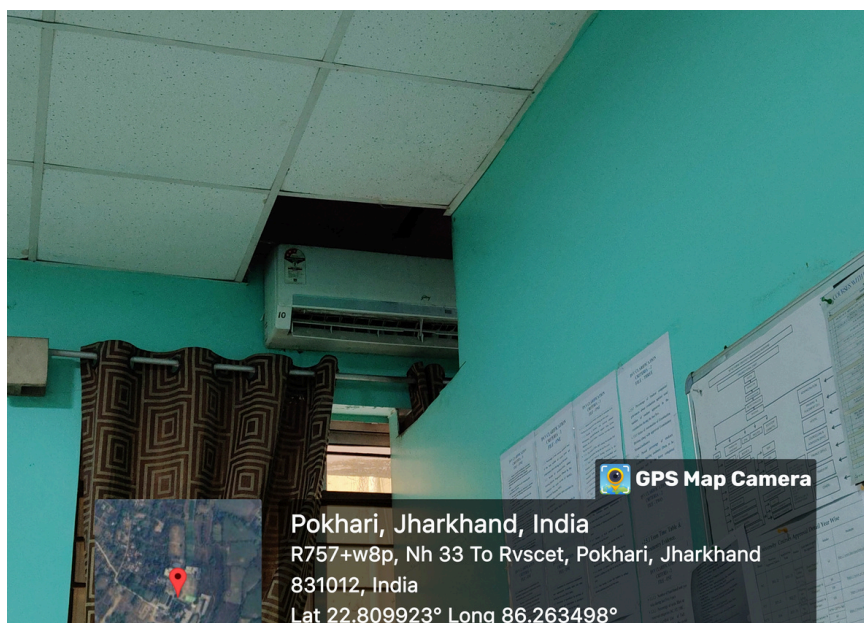
**RAINWATER HARVESTING SYSTEM WITH FILTER, DOWNPIPES AND WATER COLLECTION CIRCUITS AT NETAJI SUBHAS UNIVERSITY**



### 3.2.7 Energy Conservation

This indicator focuses on energy consumption at the NETAJI SUBHAS UNIVERSITY, encompassing energy sources, monitoring systems, lighting solutions, appliances, and the efficient use of natural resources. Energy management is a crucial aspect of campus sustainability, significantly influencing the institution's environmental footprint. The University is dedicated to optimizing energy use, thereby reducing operational costs and contributing to global efforts against climate change.

To enhance energy efficiency, the University has implemented various strategies, including the widespread use of **LED tubes**, which significantly conserve energy compared to traditional lighting. Additionally, energy-saving appliances and sustainable lighting systems are utilized, and natural resources are integrated wherever possible. Regular monitoring of energy consumption is conducted to identify areas for improvement and ensure responsible resource use. Currently, the University's monthly average energy consumption is 32,000 Kwh, reflecting its ongoing commitment to balancing operational needs with sustainable energy practices across the campus





## Electrical equipments at the college

Department / Building	Appliance	Ground Floor	1st Floor	2nd Floor	3rd Floor	4th Floor
<b>Shivram Rajguru Block</b>	Penal light	7	6	7		
<b>(Administration)</b>	Ceiling FAN	41	43	3	90	18
	Water pump	1		1	1	
	LED Tube	11	10		107	21
	Conventional tube		12	1		
	bell		1			
	Halogen			1		
	washing machine			2	2	4
	led bulb				34	16
	Exhaust fan				8	5
	LED tube				3	
	Battery [solar]					20
	20 KVA Solar ups					1

Department / Building	Appliance	Ground Floor	1st Floor	2nd Floor	3rd Floor	4th Floor
<b>Khudiram Bose Block</b>	Ceiling FAN	30	34	-	21	
<b>(Hotel Management)</b>	LED Tube	24	20	-	20	
	Conventional Tube	10	14	-	-	
	LED Bulb		2	-		
	Exhaust Fan	2	2			
	Fridge		2			
	Wall Fan	5				
	Computer	5	4		6	
	Water pump				1	
	LED Panel	34			150	
	Air Conditioner	4	5		9	
	Autoclave	1				
	UPS 10 KV	1				
	Motor 1.5 HP	1				
	Battery	20				
	Television	1	3			
	Projector		1		5	

## Electrical equipments at the college

Department / Building	Appliance	Ground Floor	1st Floor	2nd Floor	3rd Floor
<b>Chandrashekhar Azad Block</b>	Ceiling fan	20	13	23	-
<b>(Pharmacy)</b>	LED Tube	18	25	22	19
	Conventional Tube	20	8	-	-
	LED Bulb	7	5	-	-
	Exhaust Fan	5	5	4	-
	White Board	5		-	-
	Fridge	1	1	-	-
	Wall Fan	4	4	25	24
	Computer	3	3	6	6
	Water cooler / dispenser	1	1	2	-
	Water pump	1			-
	LED Panel	2	6	227	228
	Centrifuge MC	1	2	-	-
	Vacuum pump	2	1	-	-
	Heating Mantle	3	1	4	-
	Weighing Balance	3	2	2	-
	Microscope	1	-		-
	Projector	4	-	6	8
	Split Air Conditioner	6	-	10	9
	Sound System	1	-	3	3
	BOD Incubator	1	-	-	-
	UV Spectroscopy	1	-	-	-
	Colony Counter	1	-	-	-
	Magnetic Stirrer	2	1	-	-
	Distillation Apparatus	1	1	-	-
	Calorimeter	1	1	-	-
	Conductivity meter	1	-	-	-
	Digital Potentiometer	1	-	-	-
	PH meter	1	-	-	-
	Ultrasonic cleaner	1	-	-	-
	Spectroscopy	1	--	-	-
	Turbidimeter	1	-	-	-

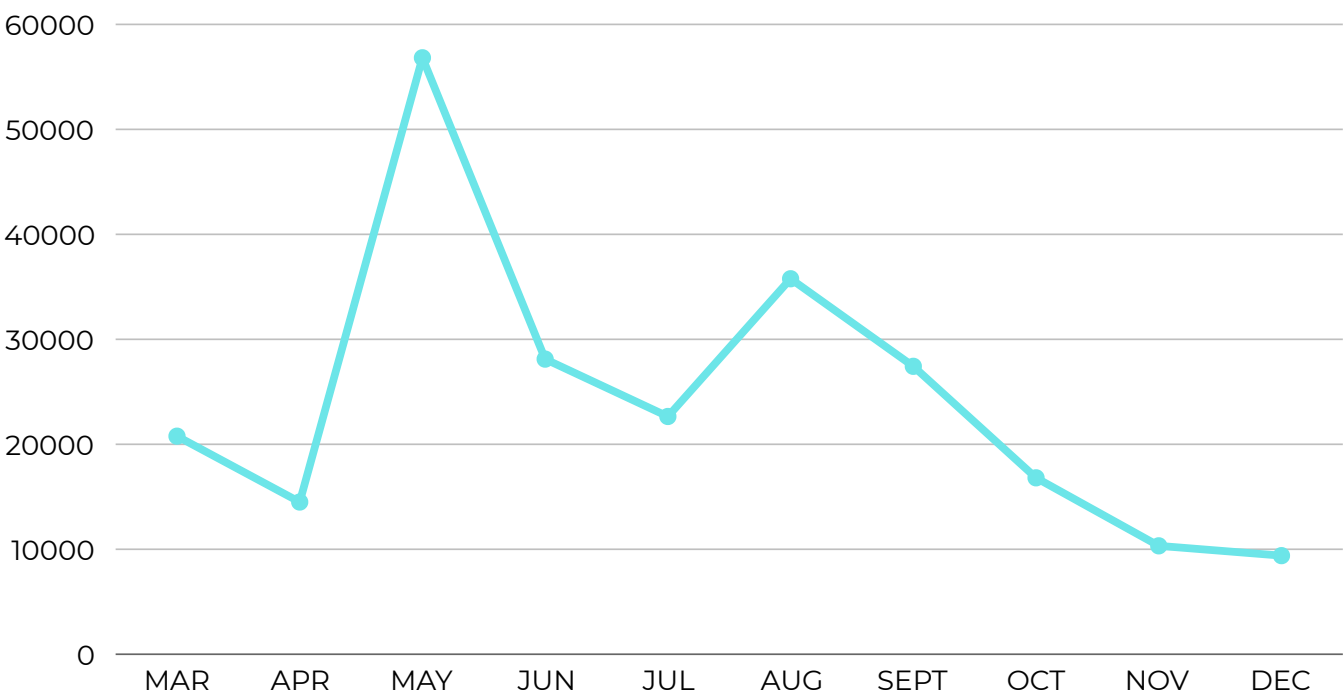
## Electrical equipments at the college

Department / Building	Appliance	Ground Floor	1st Floor	2nd Floor	3rd Floor	4th Floor
<b>Sukhdev Thapar Block</b>	Ceiling FAN	34	51	86		
<b>(BEd)</b>	LED Tube	20	40	96		
	Conventional Tube	5	8	4		
	LED Bulb	3		1		
	Exhaust Fan	3	1	1		
	Computer	4	30	3		
	Water cooler / dispenser	1	2			
	Panel light	8	5		3	
	Air Conditioner		6			
	Halogen	1				
	Router			1		
	Fridge	1				
	TV	2	2	2		
	Battery	2				

Department / Building	Appliance	Ground Floor	1st Floor	2nd Floor	3rd Floor	4th Floor
<b>Bhagat Singh Block</b>	Ceiling fan	51	47	25	23	
<b>(Administration)</b>	LED Tube	52	55	20	23	
	LED Bulb	6	1		23	
	LED Halogen	1		3	5	
	LED Panel	139	22	200	12	
	Water Cooler	1				
	TV	2	2			
	Wall Fan	22	23	31		
	Biometric	2				
	AC	20	21	20		
	Computer	129	107	1		
	Stand Lamp	2				
	Xerox / printer scanner	13	12	22	2	
	Router	2	3	1	4	
	Exhaust fan	2	2	3	6	
	Water dispencies		1	1	1	
	Park Light			6		

Power Consumption at campus

Month	Energy consumption				
	BP467	PKH151	PKH152	PKH71	TOTAL
MARCH'23	5324	12342	1434	1673	20773
APRIL'23	7340	1879	1786	3495	14500
MAY'23	9487	11980	2788	32564	56819
JUNE'23	1483	9800	3345	13487	28115
JULY'23	2786	10190	2784	6890	22650
AUGUST'23	3628	14342	5343	12453	35769
SEPTEMBER'23	897	12888	4988	8655	27428
OCTOBER'23	1198	8134	3123	4351	16806
NOVEMBER'23	973	4098	1980	3276	10327
DECEMBER'23	564	3676	2254	2899	9393





### 3.2.8 Solar panel

#### Solar Panel Specifications:

- Power Output: 545 W
- Voltage: 50.3 V
- Current: 12.8 A
- Temperature Range: -40°C to +85°C

#### Certifications:

- IS 14286
- IS 61730-1 & 2
- IS 62804
- IEC 61701
- Fire Rating: BIS
- ISO 9001, 14001, 45001 (In Process)

#### Panel Tier: Tier 1

**Efficiency: 21.67%**

#### Solar Plant Performance:

- Plant Capacity: 10 kWp
- Daily Power Generation: 40 kWh
- Monthly Power Generation: 1,200 kWh
- Annual Power Generation: 14,400 kWh

#### Power Generation Analysis:

The solar power system analyzed consists of a 10 kWp (kilowatt peak) solar plant. The system is capable of generating:

- Daily Output: 40 kWh/day
- Monthly Output: 1,200 kWh/month
- Annual Output: 14,400 kWh/year

### **System Overview:**

This solar panel system is designed with high efficiency, offering an impressive efficiency rate of 21.67%. The panels operate within a broad temperature range, making them suitable for various environmental conditions. With 19 plates and a total power output of 545W per panel, this system demonstrates a robust capacity for energy generation.

The solar plant, rated at 10 kWp, is projected to produce approximately 40 kWh per day, translating to around 1,200 kWh per month and 14,400 kWh annually. This output significantly contributes to reducing reliance on non-renewable energy sources, lowering the carbon footprint, and promoting sustainability.

### **Certification and Compliance**

The solar panels comply with multiple standards, including IS 14286, IS 61730-1 & 2, and IEC 61701, ensuring they meet stringent quality and safety criteria. The BIS fire rating adds another layer of safety, while ISO certifications for quality (9001), environmental management (14001), and occupational health and safety (45001) are in process, indicating ongoing efforts to maintain high standards across the board.

### **Power generation by Generator:**

63 KVA Kirloskar (1 No.), 125 KVA Jackson (1 No. ), 20 KVA(1 No.) and 10 KVA(3 No.s)

### **Conclusion**

The analyzed solar power system is a highly efficient, certified, and reliable energy solution. Its capacity to generate significant amounts of renewable energy makes it a valuable asset for reducing environmental impact and advancing sustainable energy practices.



### 3.2.9 Waste Management

NETAJI SUBHAS UNIVERSITY, recognizes that proper waste management is essential for a well-defined ecosystem and is a crucial aspect of campus development. The college is committed to the “Clean and Green Campus” mission, which encompasses the management of solid waste, liquid waste, biomedical waste, and e-waste. Collaborating with various NGOs, the college continually introduces new initiatives to sustain and energize this mission.

#### Key Initiatives:

- Waste Collection and Segregation:
  - Installation of Waste Bins: Multiple waste collection containers have been strategically placed around the campus. Students are encouraged to correctly identify and dispose of waste in these bins.
  - Training of Utility Staff: A team of trained utility workers is engaged on campus, proficient in waste segregation and management
- Recycle Station Collaboration
  - Partnership with KORU FOUNDATION: A “Recycle Station” has been established in collaboration with KORU FOUNDATION. The station promotes the concept “Waste is not waste until we waste it.”
  - Concept: The Recycle Station encourages the community to view waste as 'recyclables,' fostering resource conservation and environmental protection.
- Awareness and Education:
  - Waste Management Drives: Regular awareness drives are conducted to educate students on proper waste management.
  - Community Outreach: Nearby villages are educated on waste management basics and encouraged to adopt sustainable practices.
- 3R Strategy Implementation:
  - Reduce: Efforts to minimize waste generation.
  - Reuse: Promoting the reuse of items after proper segregation and cleaning.
  - Recycle: Segregated recyclable items are handed over to appropriate agencies.

#### Plastic Ban Initiatives:

- Campus Messaging: Clear messages about the plastic ban are displayed campus.

#### Composting Initiative:

- Composting Mesh at Campus: A composting mesh has been set up at the campus for organic and garden waste, converting it into useful compost for campus gardens.

### **3.2.10 Solid waste management:**

INETAJI SUBHAS UNIVERSITY, is committed to effective waste management as part of its “Clean and Green Campus” mission. This mission includes the management of solid waste (biodegradable and non-biodegradable), liquid waste, biomedical waste, and e-waste. The college collaborates with various NGOs to sustain and enhance these initiatives.

#### Key Initiatives:

- Solid Waste Management:
- Biodegradable Waste:
  - Types: Includes vegetable peels, dry leaves, and food waste.
  - Usage: Segregated and used as bio-fertilizers for the campus gardens.
  - Composting: A composting pit measuring 2m x 2m x 2m converts these wastes into organic fertilizer.
- Non-Biodegradable Waste:
  - Types: Includes minimal use of polythene bags, plastic, glass, and metal wastes.
  - Reduction Measures: Polythene bags are minimized or avoided entirely to maintain a plastic-free campus.
  - Alternatives: The campus café has replaced disposable plastic cups and plates with steel plates and earthen cups.





### Recycle Station:

- Location: Situated beside the Biogas plant.
- Function: Glass and metal wastes are collected in well-marked bins and sold to recyclers.
- Awareness: Notifications and signs promoting the ban on single-use plastic are displayed at strategic locations.

### Waste Segregation:

- Binning System:
  - Separate Bins: Provided for biodegradable and non-biodegradable waste at source.
  - Dedicated Bins: Specific bins for biodegradable, plastic, food waste, and non-biodegradable waste.
- Metal and Wooden Waste: Stored and sent to authorized scrap agents.

### Garden and Lawn Waste:

- Tree Droppings and Lawn Management: Major sources of solid waste, handled through separate dustbins for biodegradable and plastic waste.

### Awareness and Training:

- Ground Staff Meetings: Regular meetings with ground staff to discuss campus cleanliness and proper waste disposal practices

### 3.2.11 E-waste management

#### Overview:

is dedicated to the proper management of e-waste, which consists of electronic devices discarded after they have reached the end of their useful life. The e-waste generated on campus primarily includes outdated computer systems, keyboards, electronic kits, battery cells, calculators, CDs, and similar items.

#### Key Initiatives:

- Systematic Collection and Disposal:
  - E-Waste Types: Includes out-of-use electronic devices such as computer systems, keyboards, electronic kits, battery cells, calculators, CDs, etc.
  - Collection Process: E-waste is systematically collected on campus and prepared for appropriate disposal.
- Partnership for Disposal:
  - MoU with Koru Foundation and Hulladek: The college has signed a Memorandum of Understanding (MoU) with Koru Foundation and Hulladek to ensure smooth and proper disposal of e-waste.
  - Purpose: This partnership aligns with the E-Waste Management Rules, 2016, and ensures compliance with government regulations.

#### Impact and Benefits:

- Environmental Compliance: Ensures that e-waste is disposed of in an environmentally friendly manner, complying with legal requirements.
- Sustainable Practices: Reinforces the college's commitment to sustainable waste management practices.

### 3.2.12 Green area management

#### Overview:

NETAJI SUBHAS UNIVERSITY feature diverse tree species including Medicinal plants that provide numerous environmental benefits. These trees, planted through various university programs, have become integral to the institution.

#### Key Contributions:

- Environmental Benefits:
  - Oxygen Production and Air Quality: Trees supply oxygen and improve air quality.
  - Climate Regulation: They moderate the effects of sun, rain, and wind, and help conserve water and soil.
  - Wildlife Support: Trees provide food and shelter for various bird species and other wildlife.
- Biodiversity and Aesthetics:
  - Species Variety: A wide range of tree species enhances biodiversity.
  - Seasonal Beauty: Trees display changing shapes, forms, textures, and colors throughout the year.
- Quality of Life:
  - Enhanced Environment: Trees improve the quality of life for the college community and nearby residents by cooling the campus and providing aesthetic and health benefits.

#### Recommendations:

- Ongoing Plantations: Continue tree planting programs.
- Biodiversity Monitoring: Regularly monitor tree health and diversity.
- Community Involvement: Engage the local community in conservation activities.

Table: List of tree species at all campuses -

SI No	Common Name	Botanical Name	Uses	Numbers
1	Coconut tree	Cocus nucifera	Anti-microbial	20
2	Mango tree	Mangifera indica	Anti-bacterial, Anti-Fungal	25
3	Ashoka Tree	Saraca asoca	Blood Disorder Tumor	3
4	Acacia Tree	Acacia Nilotica	Throat Infection Wound healing	4
5	Teak Tree	Tictona Grandis	Skin disease Reducing fat	12
6	Rubber Tree	Ficus Elastica	Manufacturing Rubber	1
7	Champak Tree	Magnolia Champaca	Timber	2
8	Bottle palm	Hyophorbe Lagercaulis	Anaemia	20
9	Guava Tree	Psidium Guajava	Diabetes	5
10	Hoop Pine	Araucaria Cunningham	Flooring	2
11	Arca Palm	Dypsis Lutescens	Air purifier	4
12	Peace Lily	Spathiphyllum	Ornamental	2
13	Arabian Jasmine	Jasmine sambac	Liver Disease	3
14	Shami Tree	Prosopis Cineraria	Constipation	3
15	China Rose	Hibiscus Rosa Sinesis	Skincare	3
16	Juhi	Jasmiun Auriculation	Perfumes	8
17	Croton	Codiacum Variegatum	Biofuel	2
18	Belly Flower Plant	Jasminum Sombac	infections	7
19	Kamini Flower	Muraya Paniculata	Cough	2
20	Rose	Rosaceae	Anxiety	15
21	Lemon	Citrus Limon	Anti-cancer Anti-Oxidant	1
22	Mussaenda Plant	Mussaenda Erythrophylla	Jaundice Ulcer	3
23	Gulmohar Tree	Royal Poinciana	Bee farming malaria	3
24	Kaner Ka Phool	Merium Oleander	Deprosy Inflammation	1
25	Bael	Aegle marmelos	Dysentery	1
26	kathal	Artocarpus Heterophyllus	Anti-Fungal	1
27	Sheesham Tree	Dalbergis Sissoo	Blood problem Skin Disease	3
28	Gulmohar	Delonix regia	Cardio protective	3
29	Palash	Butea Monosperma	Dyes	2
30	Shimul Red	Bombax Ceiba	Gynaecological and urogenital disease	1
31	Shatavari	Asparagus Racemosum	Hormonal Balancing	2
32	Golden Ficus	Ficus Microcarpa Golden	Air purifier	1
33	Tagar	Tebemontena	Sleep inducing	2
34	Laung (Clove)	Syzygium Aeromalicum	Boosts Immunity	1
35	Cardamom	Elettaria Cardamomum	Digestion	1
36	Dalchini	Cinnamonium Verum	Vomiting, Headache Dental care	1
37	Bay Leaf	Laurus Nobilis	Skin Rashes, Rheumatism	1
38	Amla	Phyllonthus Amblica	Better Digestion	1
39	Hadjor	Cissus Quadrangularis	Swelling Pain Healing fractures	1
40	Henna	Lawsonia Inermis	Intestinal Ulcers	1
41	Coffee	Coffee Arabica	Mental Alertness	1





## GREEN COVERAGE AT NETAJI SUBHAS UNIVERSITY



### **3.2.13 Use of Bicycles :**

At INETAJI SUBHAS UNIVERSITY, students and non-teaching staff commute by bicycle, supported by a dedicated cycle shed for vehicle safety. This green initiative helps reduce environmental pollution and carbon footprints. Additionally, the college pathways are laid with permeable paver blocks, facilitating rainwater seepage and ground water recharge.

Key Initiatives:

- Sustainable Transport:
  - Bicycle Commute: Encourages students and staff to use bicycles, reducing environmental pollution and carbon emissions.
  - Cycle Shed: Constructed to provide secure parking for bicycles.
- Eco-Friendly Infrastructure:
  - Permeable Pathways: Pathways with paver blocks allow rainwater to seep through, recharging the groundwater and preventing waterlogging.

### **3.2.14 E - communication**

NETAJI SUBHAS UNIVERSITY has implemented efficient e-governance and digital infrastructure to enhance communication and reduce paper usage.

Key Initiatives:

- LAN Network:
  - Connectivity: All departments, the examination cell, and laboratories are well-connected through an efficient LAN network.
  - Digital Communication: Inter-office correspondence is conducted via email, significantly reducing paper usage.
- E-Governance Implementation:
  - Areas of Operation: E-governance is implemented across various areas of operation within the institution.
  - Collaboration: The college partnered with Master Soft in the 2021-2022 session to implement these digital solutions.

## BIOGAS PLANT FOR FOOD WASTE

50kg biogas plant was installed at Netaji Subhas University to process canteen waste into usable gas. This initiative aims to reduce organic waste, minimize methane emissions, and promote renewable energy utilization within the campus.

### Implementation Details:

- Capacity: 50kg per day
- Feedstock: Food scraps and organic kitchen waste from the university canteen
- Output: Biogas for cooking and organic slurry as a byproduct for composting
- Technology Used: Anaerobic digestion with a continuous feed system

### Impact & Benefits:

- Waste Reduction: Processes approximately 1.5 tons of waste monthly, diverting it from landfills.
- Energy Savings: Generates clean fuel for the canteen, reducing LPG dependence.
- Environmental Impact: Mitigates greenhouse gas emissions, particularly methane.
- Educational Value: Serves as a learning model for students on renewable energy and waste management.

Regular monitoring ensures efficient operation and optimal gas production. Future scaling and integration with additional waste streams are under consideration. This initiative strengthens the university's sustainability framework, aligning with national goals for waste-to-energy solutions.



## GOOD PRACTICES AT CANTEEN

The Netaji Subhas University Canteen has adopted several eco-friendly practices to minimize waste, conserve resources, and promote sustainability. These initiatives align with the university's commitment to a greener campus by reducing single-use disposables and improving waste management.

### Sustainable Practices Implemented:

- **Reusable Steel Plates & Cutlery:** Eliminated plastic and disposable utensils, significantly reducing non-biodegradable waste.
- **Water Stations:** Installed filtered water dispensers to reduce plastic bottle usage, encouraging students and staff to bring reusable bottles.
- **Proper Waste Segregation:** Separate bins for dry waste, wet waste, and recyclables ensure efficient disposal and recycling.
- **Food Waste Collection:** All organic waste from the canteen is collected and processed in the 50kg biogas plant, converting it into clean energy.

### Impact & Benefits:

- **Waste Reduction:** Drastically cuts down plastic and food waste generation.
- **Cost Savings:** Reduces expenditure on disposable items.
- **Environmental Responsibility:** Lowers carbon footprint by minimizing landfill waste.
- **Awareness & Engagement:** Encourages students and staff to adopt sustainable habits.

These green initiatives contribute to a cleaner, more sustainable campus, setting a benchmark for other institutions to follow. Regular monitoring ensures compliance and continuous improvement.





## WEATHER MONITORING SYSTEM

To enhance environmental awareness and scientific learning, Netaji Subhas University has installed a Weather Monitoring System on campus. This initiative aims to track real-time weather conditions, support research, and promote data-driven sustainability efforts.

### System Features:

- Parameters Monitored: Temperature, humidity, rainfall, wind speed, and air quality.
- Technology Used: Digital sensors with automated data logging and cloud integration.
- Location: Strategically placed for accurate campus-wide weather assessment.

### Impact & Benefits:

- Educational Resource: Provides real-time weather data for student research and coursework.
- Disaster Preparedness: Assists in monitoring extreme weather conditions for early warnings.
- Sustainability Tracking: Supports analysis of climate patterns and air pollution trends.
- Data-Driven Decision Making: Helps optimize campus activities like water conservation and tree plantation drives.

This initiative reinforces the university's commitment to environmental education and sustainability, enabling students and faculty to engage with real-world climate data while fostering a scientific approach to ecological conservation.





## 4.0 Conclusion

This Green Audit involved discussions, questionnaires with various teams, and interactions with key personnel on a wide range of environmental issues. Netaji Subhas University is committed to minimizing its environmental footprint and implementing sustainable practices across campus.

### Key Findings:

- **LED Lighting:** Classrooms, lecture halls, and many strategic locations are fitted with energy-efficient LED lights and tubes, reducing electricity consumption.
- **Solid Waste Management:** Waste is segregated at source, collected at the recycling station, and appropriately disposed of or repurposed.
- **Rainwater Harvesting:** The main administrative buildings are equipped with a rainwater harvesting system, contributing to water conservation.
- **Noise Reduction:** Generators are fitted with acoustic chambers to minimize noise pollution on campus.
- **Greenery and Landscaping:** The university maintains extensive greenery, ensuring a clean and sustainable learning environment.
- **Vermicomposting:** A fully operational vermicomposting system processes organic waste into nutrient-rich compost for gardening.
- **Medicinal Garden:** A dedicated medicinal garden has been established, supporting biodiversity and educational initiatives.
- **Biogas Plant:** A 50kg biogas plant has been set up to convert canteen food waste into clean energy, reducing landfill waste and LPG dependency.
- **Weather Monitoring System:** A real-time weather monitoring station is installed on campus to track temperature, humidity, rainfall, wind speed, and air quality, aiding research and disaster preparedness.
- **Solar Panels:** The university has installed solar panels to promote renewable energy use and reduce dependence on conventional electricity.
- **Sustainable Canteen Practices:** The canteen has adopted reusable steel plates and cutlery, installed filtered water stations to reduce plastic waste, implemented proper waste segregation, and contributes food waste to the biogas plant.

These initiatives demonstrate the university's commitment to sustainability and serve as a model for environmental responsibility. Continued monitoring, awareness programs, and infrastructure upgrades will further strengthen its green campus efforts and promote a culture of sustainability among students and staff.

## 5.0 Recommendations

- **Energy Efficiency:**
  - **LED Lighting:** Increase the installation of LED lights to reduce power consumption for lighting.
  - It is recommended that the University further enhance its renewable energy efforts by installing an additional 10 kWh solar power system to increase energy efficiency and reduce dependence on conventional energy sources.
  - **High-Efficiency Appliances:** Use 5-star rated air conditioners, fans, and CFLs.
  - **Switch-off Drills:** Conduct regular switch-off drills and shut down electricity from the main building supply after occupancy hours to prevent power loss due to eddy current.
  - **Regular Cleaning:** Clean tube-lights and bulbs periodically to remove dust and maintain efficiency.
- **Water Management:**
  - **Overflow Monitoring:** Implement monitoring and control measures for water overflow and arrange periodic supervision drills.
  - **Installation of Water meter** for the measurements of water consumption and distribution.
  - **Installation of Piezometer** for ground water level measurement.
  - **Water Audits:** Conduct water audits and balancing to ensure efficient water usage.
  - **Treated Water Reuse:** Reuse treated water for gardening purposes.
- **Waste Management:**
  - **Waste Recycling Plans:** Develop various recycling plans for different types of waste.
  - **Paper Waste:** Send paper waste, such as answer sheets, old bills, and confidential reports, for shredding, pulping, and recycling after their preservation period.
- **Environmental Impact:**
  - **Eco-Friendly Cleaning Products:** Ensure that all cleaning products used by staff have minimal environmental impact.
  - To promote use of eco products in the campus and hostel. Eg : Bamboo made toothbrushes, cloth bags, Reusable bottles etc.
- **Green Initiatives:**
  - **Tree Management:** Periodically review the list of trees planted in the garden, allot numbers to the trees, and maintain records.
  - **Indoor Plantation:** Encourage indoor planting to foster interest in students, with bonsai plants in corridors to strengthen their connection with nature.
  - **Greenery and Landscaping:** Continue to enhance the campus with extensive greenery and well-maintained landscaping.


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