Vidyasagar University

Midnapore, West Bengal

721102

7.1.2 –Supporting document of best practices

Best practices 1

Title of the practices: **Green and clean campus**

Duration (year of inception-year of discontinuation): 1997

- **Objectives of the Practice**.
  A. To increase green practices in the University and nearby areas
  B. To make the campus green and healthy
  C. To sensitize the students about nature

- **The Context.**
  University practicing this green and clean campus initiating to
  Reduce, reuse and recycle
  Safe energy
  Use sustainable transportation
  Conservation of water
  Plantation tree
  To support local product
  To reduce chemical usage
  All these are essential part of environmental protection and green practices which are implemented and promoted in the University campus and nearby villages.

- **The Practice.**
  - Plastic free campus
  - No smoking campus
  - Regular plantation
  - Watering to birds and other animals in summer
  - Regular feeding to campus dog
  - Battery operated vehicles in the campus
  - Re use of waste water
  - Ground recharging of water
  - Solar electricity
  - Use of LED bulb
  - No vehicle day and No AC day in every month

- **Evidence of Success:**
    - Biodiversity reach campus with more than 280 plant species
    - Increasing green density
    - Decreasing ground water consumption
    - Less electricity consumption

- **Problems Encountered and Resources.**
    - Huge summer temperature sometimes causes forest fire in open grass lands
    - Grazing animals destroys newly planted saplings immediately after plantation
    - Regular monitoring of the vernal able areas during summer time will reduce forest fire. Temporary fencing in newly planted sapling will limit grazing by chattels.

GREEN & ENVIRONMENTAL AUDIT REPORT

(2021-2022)

VIDYASAGAR UNIVERSITY, MIDNAPORE, WEST BENGAL

CONSULTRAIN MANAGEMENT SERVICES,
LAKE ROAD, KOLKATA

TRPOICAL INSTITUTE OF EARTH, & ENVIRONMENTAL RESEARCH (TIEER), MIDNAPORE

CONSULTRAIN MANAGEMENT SERVICE
Lake Road, Kolkata, West Bengal, India

TROPICAL INSTITUTE OF EARTH AND ENVIRONMENTAL RESEARCH (TIEER)
Reg. No. S/1L/42578 of 2006-07
Office address: M-10, Bidhannagar, Medinipur-721101, W.B., India

GREEN AND ENVIRONMENTAL AUDIT CERTIFICATE

Academic Year: 2021-2022

This is to certify that Vidyasagar University, Midnapore, West Bengal has good and healthy eco-friendly environment created for saving Earth and Nature. Tropical Institute of Earth and Environmental Research associated with Consultrain Management Service are satisfied after successful completion of Green and Environmental Audit with moral support of Honorable Vice Chancellor, IQAC Team, Staff and Students for academic year 2021-2022. This efforts taken by Faculty and Students towards environment and sustainable development, which are highly appreciable and commendable.

(Dr. Binoy Kr. Chanda)	(Dr. Pranab Sahoo)	(Mrs. Sanchita Bhattachariya)	(Dr. Sudipta Kr. Maiti)
President, TIEER	Asst. Professor & Secretary, TIEER	ISO-Auditor & CEO, CMS	Expert & Member,TIEER

ACKNOWLEDGEMENT

We, The Environment Audit Team thank the management of Vidyasagar University for assigning us such an important work on Green & Environmental audit. We appreciate the cooperation to our team for the assigned study, giving us necessary inputs to carry out audit activities.

Our special thanks to:

- Vice Chancellor of the University
- IQAC Members
- Teaching & supporting staff

AUDIT EXPERT MEMBERS

The Committee members are listed below:

SL. No.	NAME	DESIGNATION	AREA IN INTEREST
1.	Dr. Binoy Kr. Chanda	President, TIEER & Former IC, VU	Environment Science & Climatology
2.	Dr. Pranab Sahoo	Secretary, TIEER & Assistant Professor and HOD, Dept of Geography, S.B. Mahavidyalaya, Kapgari	Climate Change and Environment Management, Carbon Stocking and Biogeography
3.	Mrs. Sanchita Bhattachariya	ISO Auditor(9001, 14001, 50001) CEO, Consultrain Management services, Kolkata	Environment management Service
4.	Dr. Kanchan Bhowmik	Organic Scientist and National Expert	Green Technology & Bio Waste Management
5.	Dr. SK Mafizul Haque	Assistant Professor in Geography, CU	Climate Change and Environment Management and RS-GIS Techniques
6.	Dr. Sudipta Maity	Faulty, Dept. of Botany, Raja N.L. Khan Womens' College, Midnapore	Plants Diversity & Carbon stocking, Green Management
7.	Dr. Mrinmoy Ghorai	Assistant Professor in Zoology, PanskuraBanomali college	Fauna & Aqua animals
8.	Prof. Koushik Chatterjee	Assistant Professor , Dept of Commerce & Management , Sent Xavier's College, Kolkata	Management & Marketing
9.	Sri Amal Sasmal	Consultant, EIA and EMS	Environmental management
10.	Dr. Chandan Karan	Faculty, Dept. of Geography, S.B. Mahavidyalaya, Kapgari & EC,Member, TIEER	Land use Survey, Technician for Lab test. and Map Designer
11.	Dr. Suvendu Ghosh	Assistant Teacher in Geography & Asst, Secretary, TIEER	Soil Management and Environment Management
12.	Sri Ananda Das	Assistant Teacher in Physics & Member , TIEER	Electro physics
13.	Sri Narasingha Das	Asst, Teacher and Expert& Member , TIEER	Ecology and Environment Management
14.	Sri Bapi Mahata	Drown Surveyor	Aerial Photography
15.	Sri Achiransu Sengupta	Electrical .Engineer& Member , TIEER	Electrical service and energy management
16.	Sri Sarat Chatterjee	Surveyor& Member , TIEER	Water and Air Quality Measurement

CONTENTS

1.0 INTRODUCTION :

The word "Green" means ecofriendly and produce better environment. Green and environmental Audit is a process of systematic, documented, periodic and objective evaluation of components of environmental diversity with the aim of ensuring readiness in eco-friendly environment and conservation of natural resources in its operations. The process starts with systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of the university. Green auditing is a means of assessing environmental performance. Green audit is a valuable means for a University to determine how and where they are using the most energy or water or other resources; the University can then consider how to implement changes and make savings. It can create healthy consciousness and promotes environmental awareness, values and ethics.

1.1 Goals & Objectives:

It aims to analyse environments within and outside of the concerned area, which will have an impact on the eco-friendly atmosphere. It provides staff and students better understanding of Resource management on their area of work.

The Main Objectives of Carrying of Green Audit:

- To ensure the performance of the Institution with respect to environmental activities they are involved in, in compliance with existing laws and regulations
- To locate the Green area and the Geographical location of the University – aerial view
- To document the floral and faunal diversity of the University
- To develop and follow the waste management system
- To reduce the energy consumption of the Institution
- To report the expenditure on green initiatives, carbon foot print
- To record the air, water quality of the Institution
- To conserve the natural resources

Areas of Concern:

- WATER MANAGEMENT
- WASTE MANAGEMENT
- AIR QUALITY AND CARBON FOOTPRINT
- E-WASTE MANAGEMENT
- ENERGY MANAGEMENT
- BIODIVERSITY

This Audit has been conducted by a Committee constituted by the Experts & Scientists from different reputed Institutes. The Committee developed a questionnaire for audit based on the regulatory and statutory requirements of Centre as well State. The basic data was gathered and compiled, which the committee analyzed. By and large, the audit reveals a healthy environment inside the Vidyasagar University campus. The committee has suggested short term as well as long-term suggestions for improved environmental conditions to a higher levels and authorities and all stakeholders of the University conforms that they will give due attention and utilize opportunities for identified improvements.

Meeting with IQAC Coordinator

1.2 About the University :

Vidyasagar University, named after one of the most illustrious sons of Bengali as well as one of the doyens of Indian Renaissance, Pandit Iswar Chandra Vidyasagar , has grown out of a long cultural and educational movement in West Bengal in general and in the undivided district of Midnapore in particular. The idea of founding a University in the district was mooted by the various organizations, notably by the Regional Education Association, Midnapore, headed by Professor A. K. Gayen of IIT Kharagpur.

The University presently houses 27 PG departments 12 in Humanities and 15 in Sciences while 46 undergraduate colleges apart from 11 courses of 11 other affiliated colleges/ institutes. 14 vocational subjects and 6 other specialized courses are also offered at the UG level.

Total area of the university campus – 138.78 acres,
Main campus: 103.74 acres,
Residential campus: 35.04 acres.

MAIN CAMPUS CONSISTING	RESIDENTIAL CAMPUS CONSISTING
Administrative building	Vice Chancellor Bungalow
DDE Building with Guest House	V.I.P Guest House
Science building	Student Amenities Center
Humanities Building	P.G Girls Hostel (2 Blocks)
Silver Jubilee Building	Teacher & Officers Hostel (2 Blocks)
Central Library	Teacher Quarter (2 Blocks)
P.G Boys Hostel(2- Blocks)	Non-Teaching Staff Quarter (2 Blocks)
Non-teaching Staff hostel (2 Blocks)	
Women Infrastructure	
Sports complex with Pavilion	
Tribal cultural Building	
Electrical Sub Station	
Over Head Water Reservoir with deep tube well (4 Nos) & Pump House	

Table 1 Area Coverage of the University Campus

Area Coverage of University Premises:	Area in Percentage
Building and Construction	33
Vegetation Cover	41.2
Playground and Fallow land	25.8

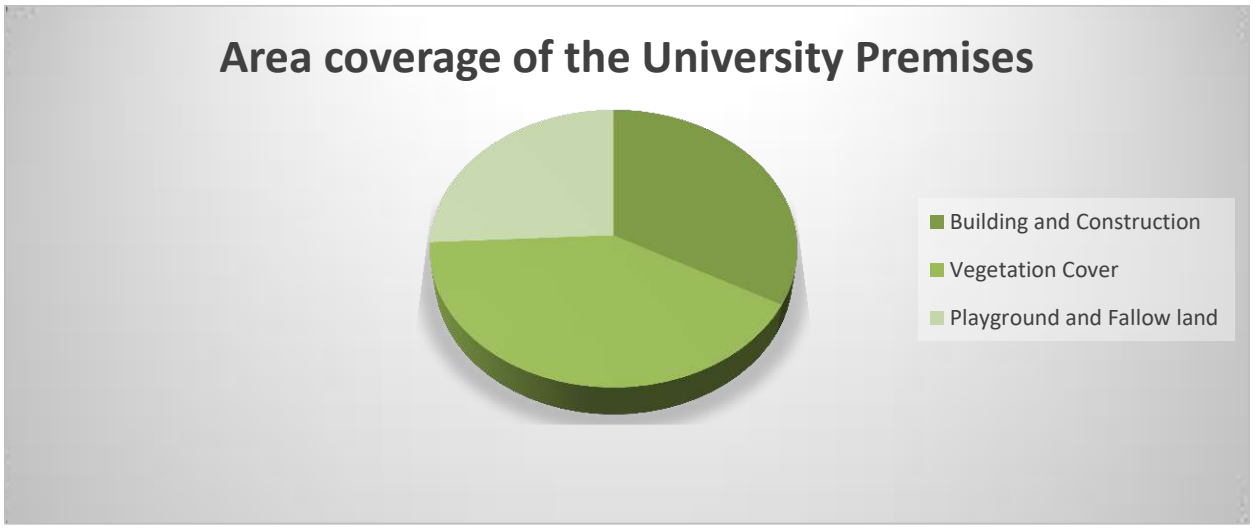


Fig. 1 Area Coverage of University Premises

Academic Department and Research Centre

Academic Departments		Research Centre
Arts/Humanities	**Science**	
Bengali	Anthropology	Centre for Environmental Studies (CES)
Business Administration	Applied Mathematics with Oceanology and Computer Programming	Centre for Life Science
Commerce with Farm Management	Aquaculture management & Technology	Gandhian Studies Centre
Economics with Rural Development	Bio-Medical Laboratory Science & Management	Women's Studies Centre
English	Botany and Forestry	Centre for Adivasi studies and Museum
Hindi	Chemistry& Chemical Technology	
History	Computer Science	
Library and Information Science	Electronics	
Philosophy& Life world	Geography& Environment Management	
Political Science with Rural Administration	Human Physiology with Community Health	
Sanskrit	Microbiology	
Santali	Physics& Techno-physics	
Sociology	Remote Sensing and GIS	
	Zoology	

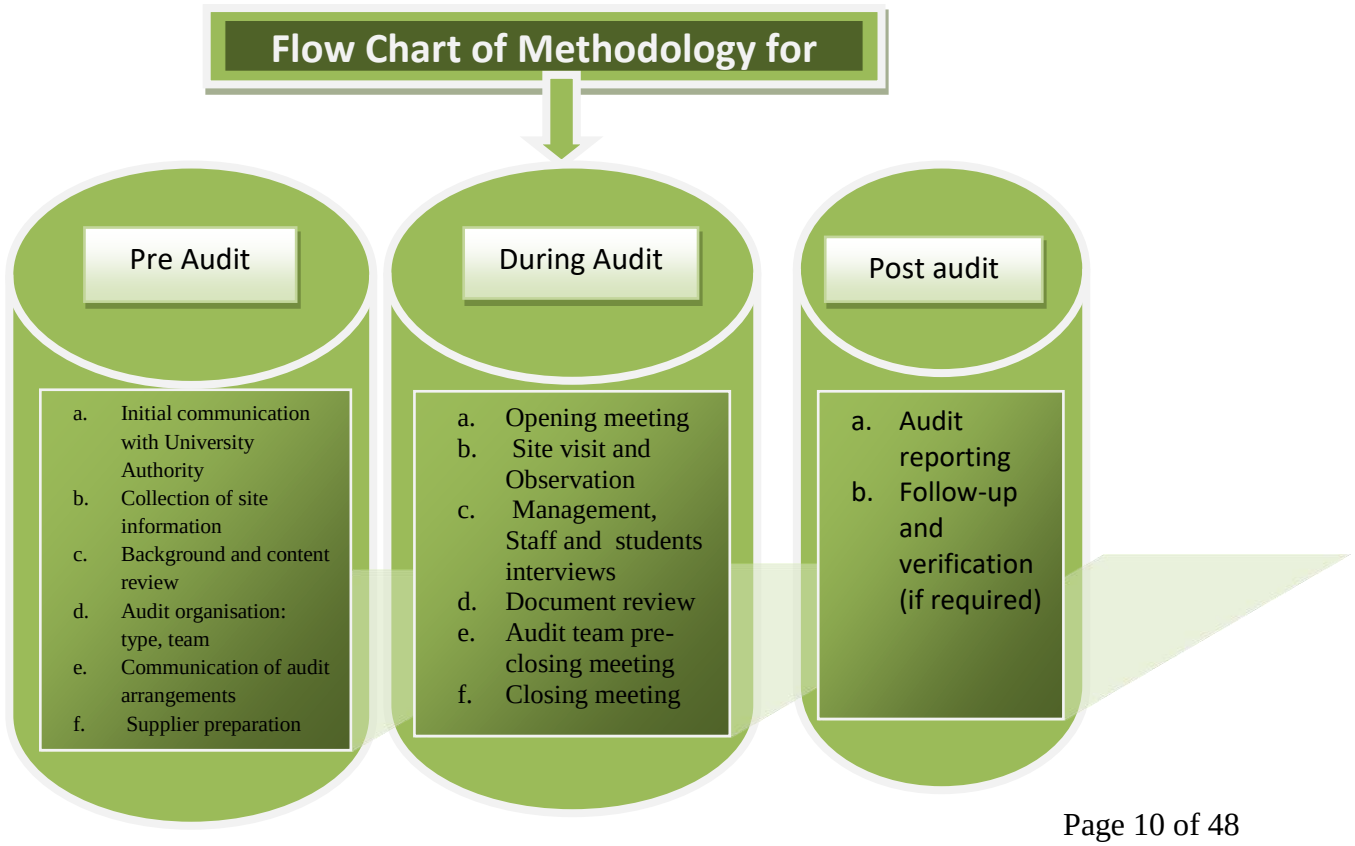
1.3 Purpose of Green and Environmental Auditing:

- To develop to more efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To promote plastic free campus and evolve health consciousness among the stakeholders
- To recognize the cost saving methods through waste minimizing and managing
- To empower the organizations to frame a better environmental performance
- To develop an environmental ethics and values systems in youngsters.
- To establish valuable tools and methods for managing and monitoring of environmental and sustainable development programs.

2.0 PRE-AUDIT STAGE:

2.1 Methodology and Survey Schedules:

The methodology is adopted for this assessment by collecting the information by onsite visit, group discussion, campus survey, enquiry, observation. Perception study and opinion survey are also included in the Auditing Report.



Schedule of Audit Programming-2021-2022

SL.NO	PURPOSE	DATE	REMARKS
1.	Communication with university authority	28th Aug,2021	Discuss about term and condition
2.	Opening Meeting	4th Sep.,2021	Submitted the survey schedule
3.	Collection information about the University	11th Sep.,2021	Introduced to Administrative Officer
4.	Campus visit and observation	28th Jan.,2022	Outdoor observation with Drown camera& Photo camera
5.	Interview with staff	11th Feb.,2022	Collected different information
6.	Review data and Assessment	14th Feb., 2022 -28th Feb, 2022	Data generate and drown figures
7.	Pre Closing meeting	11th March, 2022	Meeting with IQAC
8.	Closing Meeting	06th June, 2022	Pre-submission of the Report
9.	Submit audit report	24th June,2022	Submit of the Report

2.2 Site Visit:

1. University and its premises were visited and analyzed by the audit-teams several times to gather information.
2. Campus trees were counted and identified.
3. Medicinal garden, play grounds, canteen, library, All Department, office rooms, Hostels, DDE Building, Guest House, Staff Quarter and parking grounds were also visited to collect data.
4. Number and type of vehicles used by the stakeholders were counted and fuel consumption for each vehicle was verified with the user.
5. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted.
6. Water taps were checked. Leakage of a few water taps and over-flow tanks were noticed during the site inspection.

Following steps were taken for data collection:

- Survey to each department, centers, Library, canteen etc

- Data collected by observation and interview.
- Assessment of the environmental condition through measurement

Green Entrance

2.3 Survey & Data Collection:

- A Questionnaire was developed covering all aspects of Green and Environment aspects for collection of data.
- Arrangement of Drone survey was made available to cover every corner of the university and its neighborhood areas.
- Data Analysis - Calculation of energy consumption, analysis of water reused, waste generation & disposal arrangements.
- Recommendation — On the basis of results of data analysis and observations, some steps for reducing power consumption, water consumption, waste management etc. were recommended.

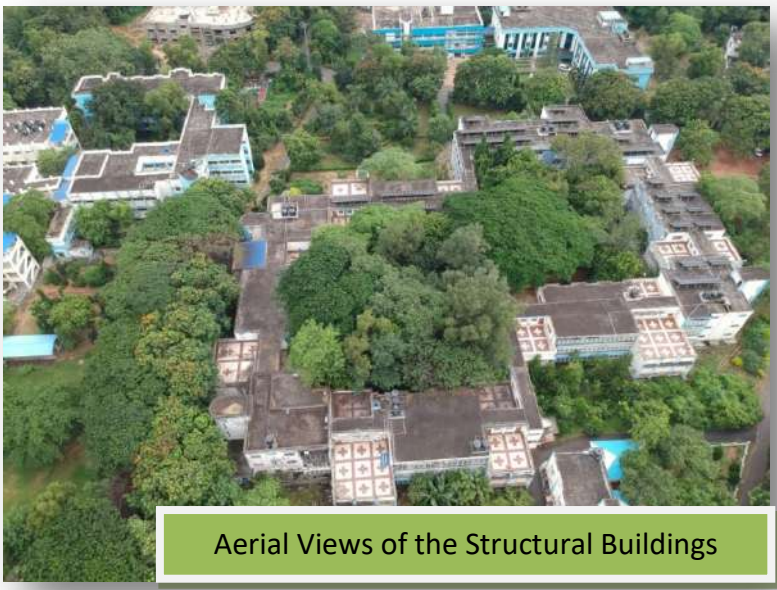
We have discussed and interacted with different groups like teachers, students and staff to identify the attitudes and awareness towards environmental issues at the institutional, district, national and global level. Data and information were also collected form utility bills, reuse of water, waste management, use of energy-saving devices and e-waste. This information was added to the carbon footprint data, generating a fairly clearer picture of the emissions and impact of the reduction measures undertaken.

Meeting with V.C

3.0 AUDIT STAGE :

3.1 Campus Survey and Enquiry:

Green and Environmental audit forms part of a resource management process. Total area including neighborhoods was surveyed using Drone and the data derived from this survey was detailed in our report.



Aerial Views of the Structural Buildings

Eco-campus concept mainly focuses on the reduction of contribution to emissions, on the efficient use of energy and water; Minimize waste generation or pollution and also economic efficiency. All these indicators are assessed in process of "Green Auditing of educational institute". Covered areas included in this green auditing are water, energy, air quality & carbon footprint, waste, biodiversity

campus.
The Audit covered the following major areas:

1. Water Efficiency and Water Management
2. Energy Efficiency and Energy Management
3. Air Quality and Carbon foot print and Management
4. Waste and Waste Management
5. Biodiversity and Green Zone and management

Table:-2 Total population of the University

	total
Students -	3890 persons
Teaching, Non-teaching and Other Stakeholders	**395** persons
Total	**4285** persons
	Approximate no of visitor (per day)-43 **persons**
	No of working days/yr -180 Days

3.2 Water Efficiency and Water Management :

Vidyasagar University is located in Lateritic drought prone region of Paschim Medinipur of W.B, which is a water scarce area. Therefore, the concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water and also proper water management practices along with rooftop rain water harvesting system must be installed in whole campus for recharging ground water and meeting part of the water requirements. It is therefore essential that any environmentally responsible institution examine its water use and Re-use practices.

a	Usage of water	That water is use for Drinking, Washing, Cleaning, Cooking, Bathing and gardening purpose. The maximum water is use for Bathing and washing in Hostels & Staff Quarter. About 38.7% water has been supplied for that sector.
b.	Consumption of water	About 40000 gl. Liter water per day
c.	Water wastage	The leakage and misuse of water is about 1.1% in whole campus. Small drip from a leaky tap and over flow can waste significant amount of water per day.

d.	Water recycle	Waste water recycle is not practiced in the institute as grey water/ sewage treatment /recycle facility is not provided. Four units of rain water harvesting system are available.

Table 3 Use of water in Different Purpose of University Premises

Use of water in Different Purpose Per Day	Use in Percentage
Bathing and washroom	35.5
Cooking and washing	20.7
Cleaning and gardening	17.2
Drinking	18.3
Others	8.3

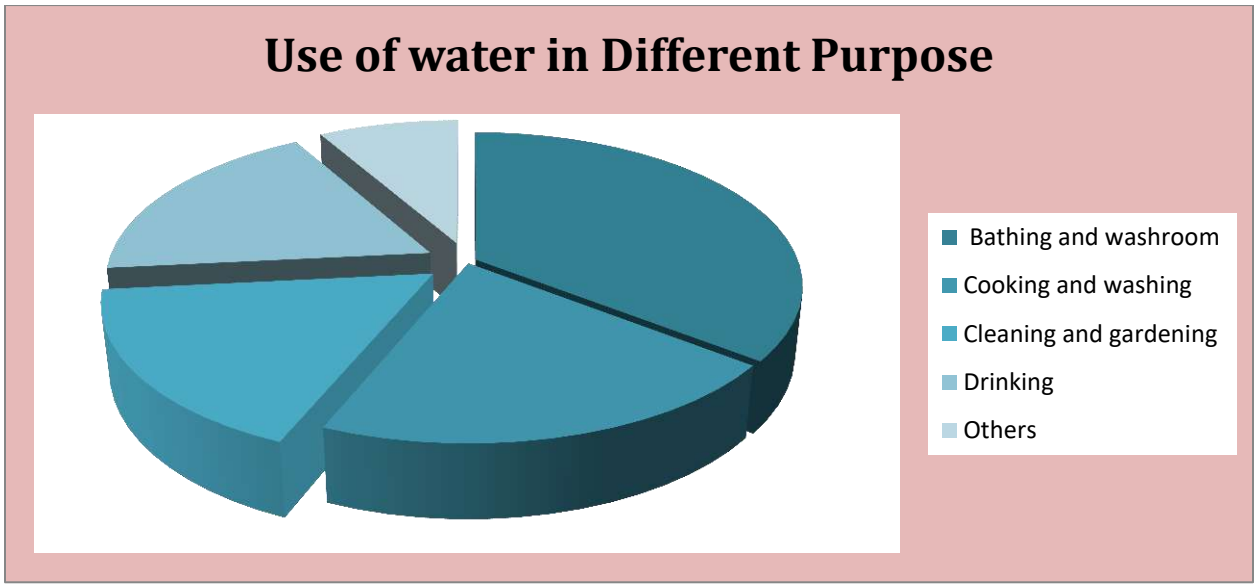


Fig.2 Use of water in Different Purpose Per Day

Sl. No.	Factors	Weightage
1	Quality of Water	H
2	Re-use of water	L
3	Water Harvesting & Recharge	M
4	Use of Surface Water	L

* H denote- Taken management policy level above 60%
** M denote- Taken management policy level 40%-60%
*** L denote-Taken management policy level below 40%

By the investigation with the help of Water P^H meter and TDS meter, we have assessed that the water quality of drinking water is highly healthy for human health(P^H of water is 7.1 and TDS is 130) . As result, Quality of Water weightage is high (H). Other hand, we have observed that only four Rechargeable unit is active in the campus area and four water harvesting plants are found here. By the observation, Reuse of water and use of surface water in the campus is not properly managed. So, weightage of taken water management policy level is Low (L).

Recommendation

Water conservation faucets in washrooms were not seen. Installation of such faucets can save water and will help in minimising the water footprint of the institute. Sanitary wastewater generated from washrooms is connected to sewerage system.

Surface water Bodies

3.3 Energy Efficiency and Energy Management :

a	Energy sources	Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent Tube uses approximately 40W while an energy efficient light emitting diode (LED) uses only less than 10 W.
b.	Energy consumption	The useable energy is Conventional and Non-Conventional energy. The used energy is 719237 unit and payable cost isaboute Rs.6788972/. Only 9.2% used Energy is Non-conventional energy contributed from Solar Power. About 2500sq ft area is covered by the solar plate. The Maximum energy is consumed for Light & Fan amounting to 52 % of total consumption. Departmental and Computer laboratory uses about 15% of total consumed energy.
c.	Usage of LPG	It has been observed that LPG gas cylinders are used in Chemistry laboratories (2pc/year) and in the quarters & Canteen (54PC/Month) for cooking. Other than this, LPG gas is not used anywhere. There is no dedicated gas storage area. Gas cylinders are refilled as and when required. There are Green generators used in the premises.

Table:- 4 Source of Energy in Percentage

Source of Energy	In Percentage
Conventional	90.8
Non -Conventional	9.2

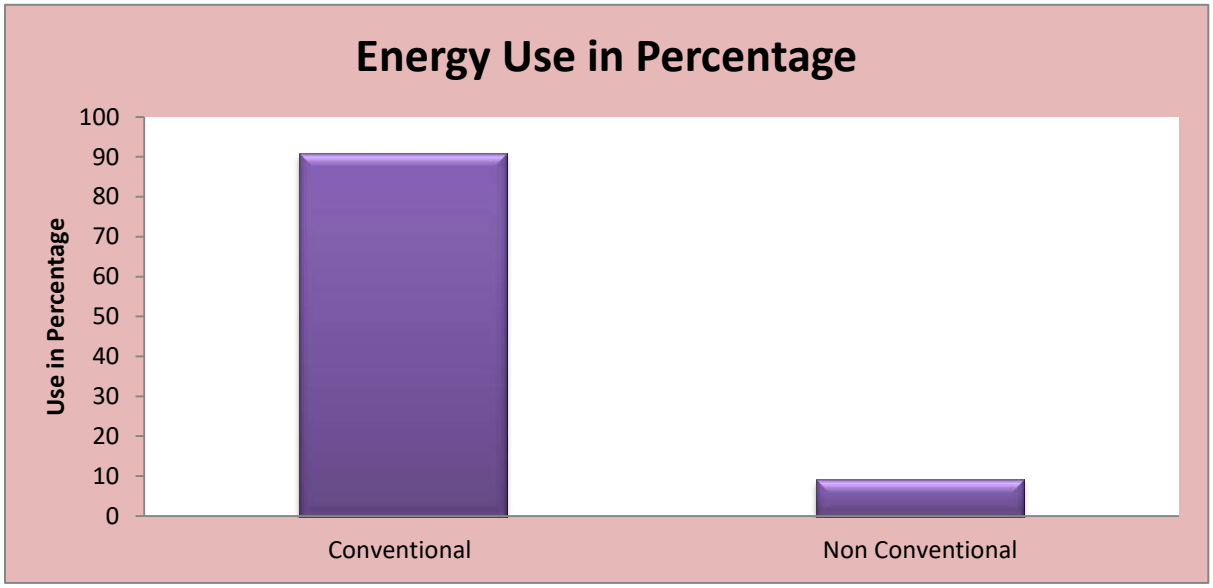


Fig. 3 Use of Energy in Percentage

Table 5 Energy Consumption in different Purpose in Percentage

Energy Consumption in different Purpose	In Percentage
light and fans	52
AC	8.2
Pump	11
Computer and Laboratory	15
Others	13.8

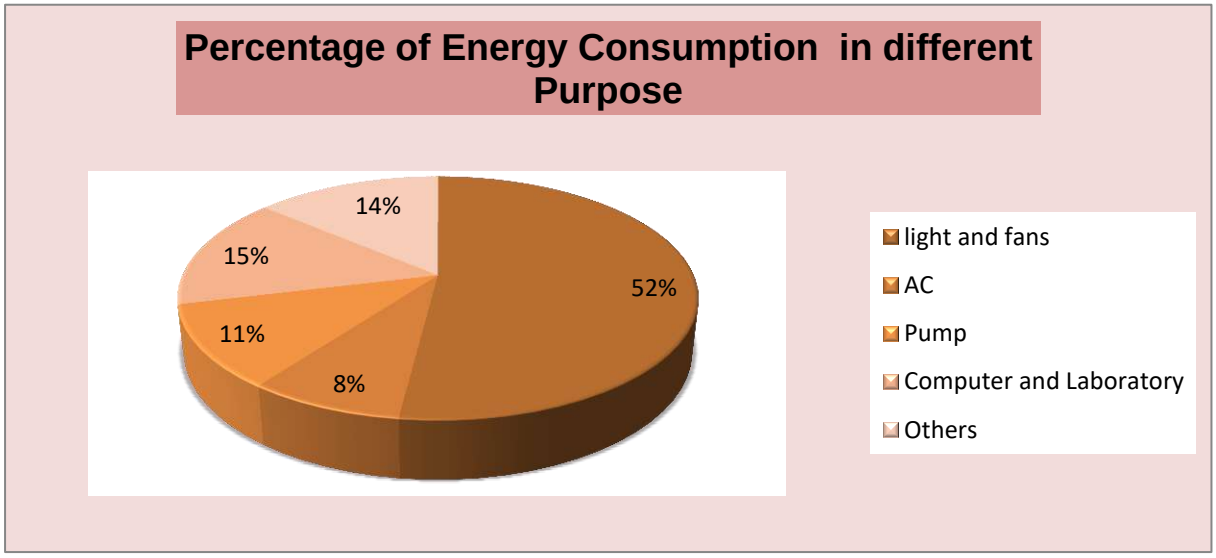


Fig. 4 Percentage of Energy Consumption in different Purpose

Data collection and Campus observation

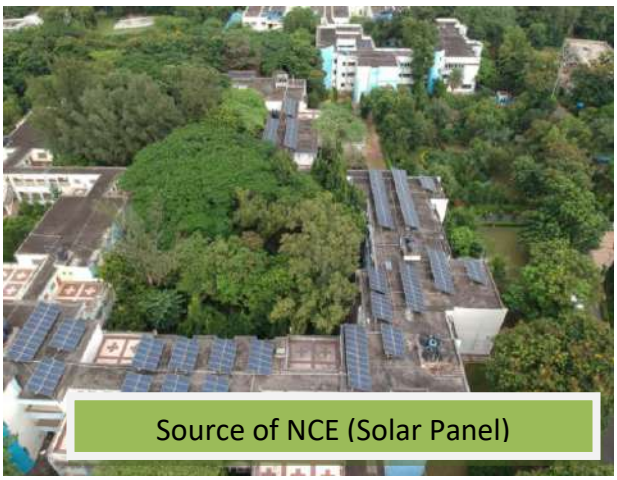
Recommendations:

a) Every classroom and lab with central switch board should have a diagram linking place of tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.

b) Use of large percentage renewable energy should be considered.

c) Installation of automatic lights with sensors can be considered.

d) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing wherein equipment's with star rating; those using eco-friendly materials; those with safe disposal policy or return to supplier after unused, can be considered.



Source of NCE (Solar Panel)

e) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.

f) Notices/ signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all Departments & Sectors when not in use.

3.4 Air Quality and Carbon Footprints :

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol, Diesel, LPG Gas). The most common greenhouse gases are carbon dioxide, CFC, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most leading greenhouse gas, comprising about 414.3 ppm(2019) to the Earth's atmosphere. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is observed that the Outdoor air quality is Fresh and comfortable for breathing to human life.

Table 6 Amount of CO2 (ppm) in different location of the University Campus

Different location of the University Premises	Amount of CO2 (ppm)
Main Gate-1	415
Gate No.-2	420
Gate No.-3	410
Car Parking Zone	412
Play ground	400
RS-GIS Lab	460
Chemistry lab	425
Library cum lab	440
Botany Lab	420
Stuff quarter Campus	410
Administrative Office	420
Geography lab	440
UCO Bank(Indoor)	420
Student Union	430
Dulung Canteen	450

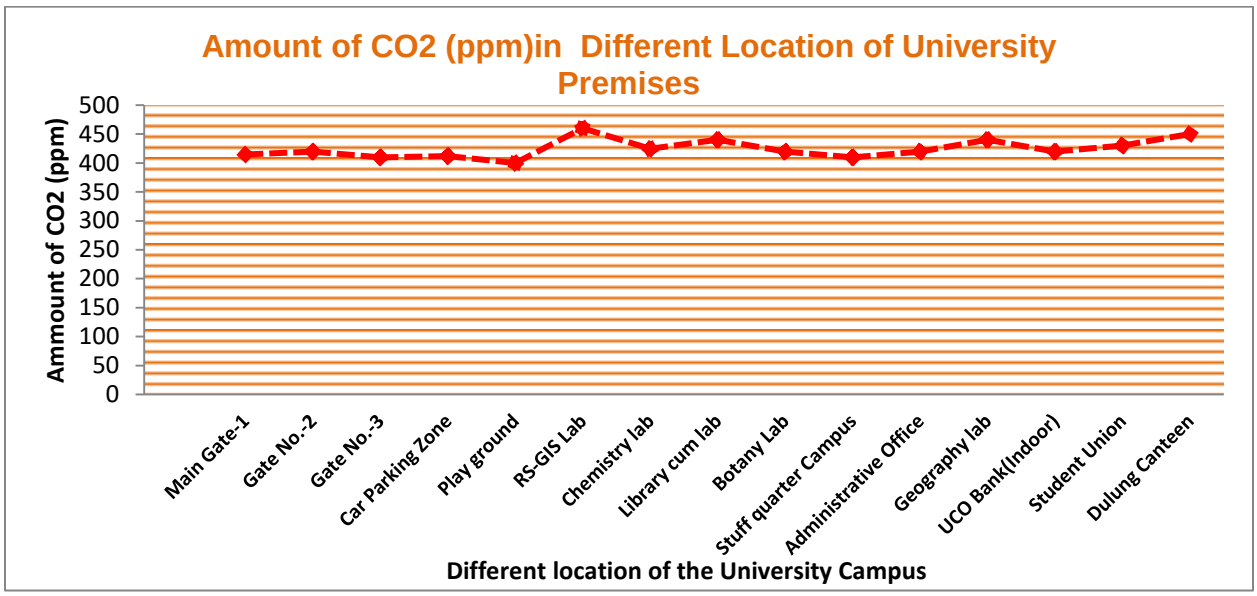


Fig. 5 Amount of CO2 (ppm)in Different Location of University Premises

Table 7 Amount of CO_2(in ppm) in the air in different location, session 2021-2022

Amount of CO_2 (ppm) in the Air in Different places of the University Premises	Amount ofCO_2 (ppm)
Outdoor	410
Indoor (Class room)	420
Indoor (Laboratories)	440

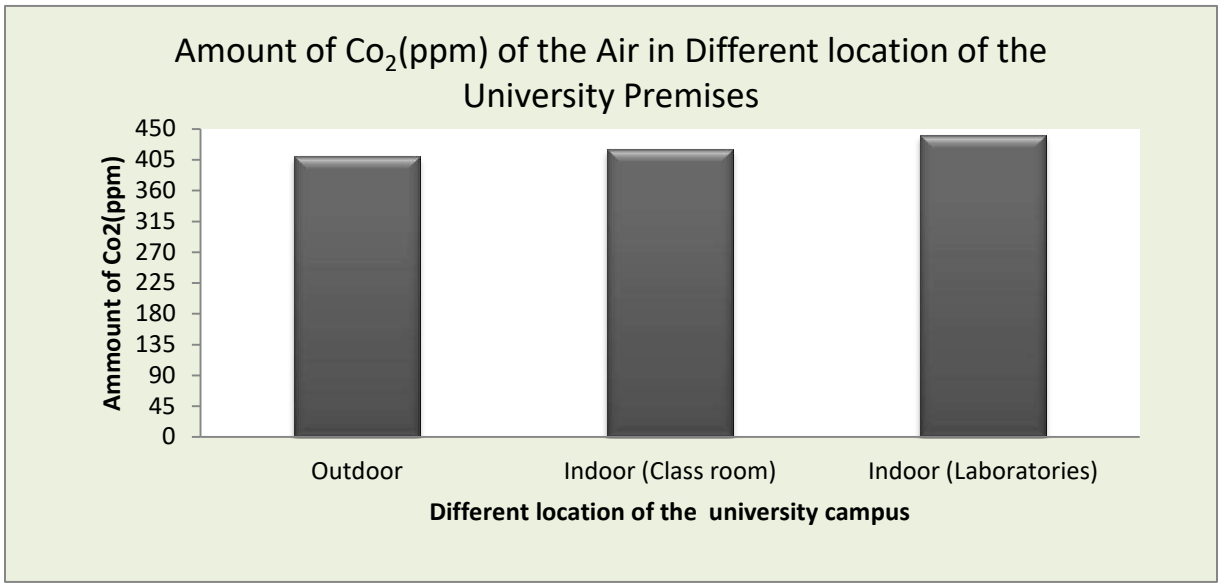


Fig. 6 Amount of Co_2(ppm) of the Air in Different location of the University Premises

Table 8 Amount of O_2 (%) of the Air in Different location of the University Premises

Different location of the University Premises	Amount of O2 (%)
Main Gate-1	20.8
Gate No.-2	20.8
Gate No.-3	20.9
Car Parking Zone	20.9
Play ground	21.1
RS-GIS Lab	20.4
Chemistry Lab	20.6
Library cum Lab	20.6
Botany Lab	20.7
Stuff quarter Campus	21
Administrative Office	20.7
Geography lab	20.5
UCO Bank(Indoor)	20.8
Student Union	20.7
Dulung Canteen	20.6

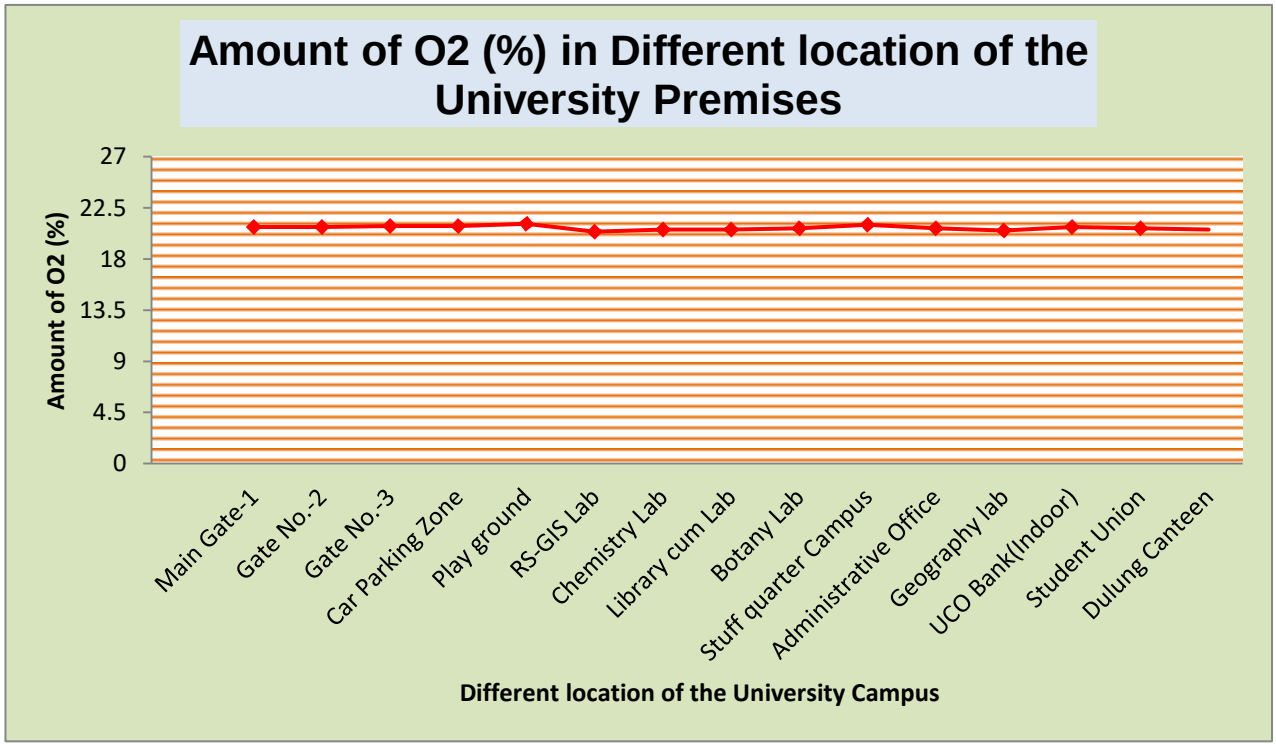


Fig. 7 Amount of O2 (%) in Different location of the University Premises

Measurement of Air Quality

Recommendation :

a) Ventilation is achieved by fans in the institute and air conditioners in Official and Lab. places.

b) Heating Ventilation and Air Conditioning (HVAC) system is not installed.

d) Exhaust fans are only provided in washrooms and chemistry lab.

e) No indoor plants were observed in the entire institute. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits.

3.5 Generation of Waste and Waste Management:

Waste (or wastes) is useless or unusable materials or components which are discarded after principal use. Sometimes, it is a defective article and of no use. In modern outlook waste may be a valuable substance subject to an appropriate operation or action on the waste. With the context of waste management RRR (Reduce, Reuse and Recycle) model may be followed in appropriate fashion.

Isolated solid waste

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse

gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable college/university. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examine its waste processing practices. Keeping the objective of the audit the following study will be limited to the waste generated in an academic campus and surroundings.

Table 9 Types of wastes

Type of Wastage in Per Day	Amount in Kg
Degradable	420
Non degradable	17

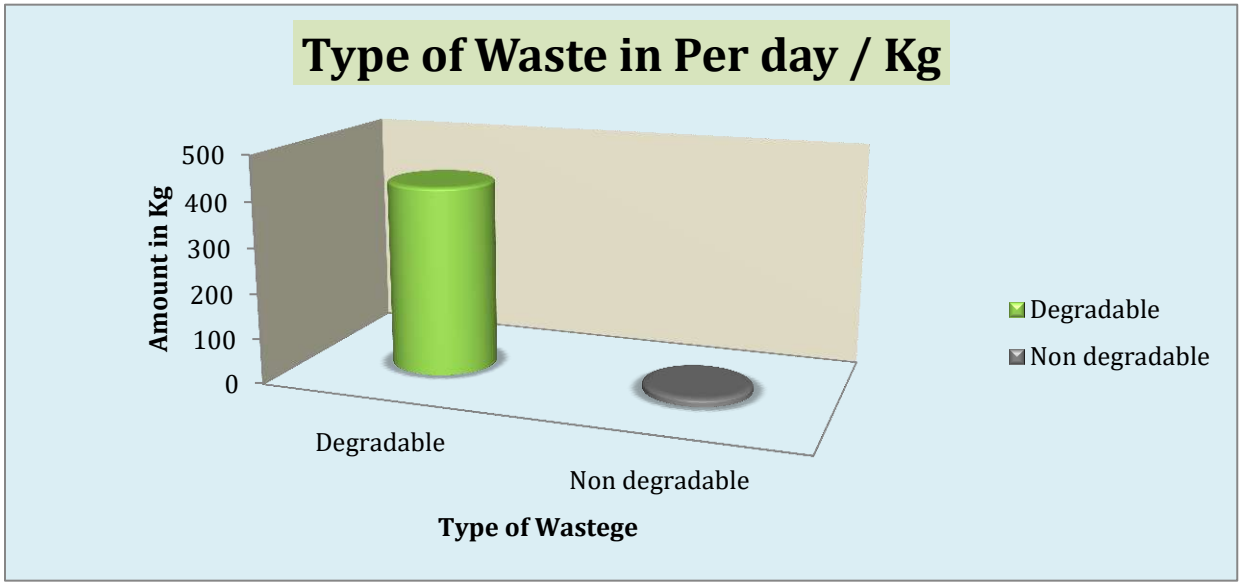


Fig. 8 Type and Amount of Waste in Per day / Kg.

The following categories of wastes are generated in the University campus:

a) Solid waste - Waste generated through paper, plastic packaging causes nuisance. Some wastes are generated after various experiments, primarily, chemistry laboratory; broken test tube, glassware are the

example.

b) Liquid waste - There are bio-chemical wastes generated through various chemical reactions and biological processes. Generally, these are being drained to nearby Surface water bodies contaminating water and soil. Appropriate means is suggested to adopt scientific liquid waste management practices. These are neutralization, bacterial control, and natural control through plantation.

Table 10 Source of Wastage in Different Sector (per day in Kg)

Source of Wastage in Different Sector(per day in Kg)	Degradable wastage Amount in Kg.	Non Degradable wastage Amount in Kg.
Canteen, Quarter and Hostel	295	9
Office	27	4
Laboratories	7	2
Forest and Garden	75	1
Others	16	1

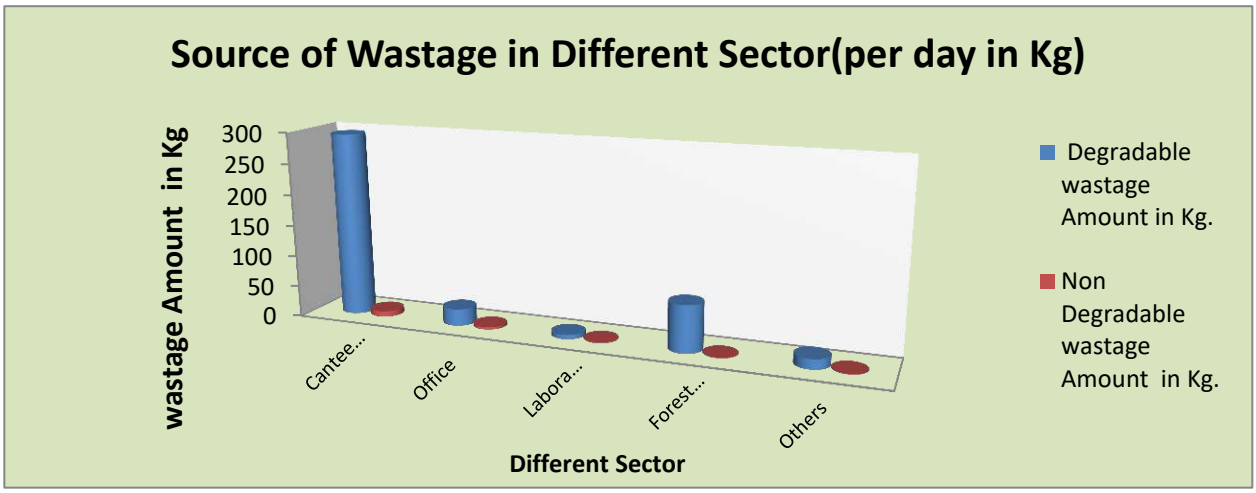


Fig. 9 Source and Amount of Wastage in Different Sector (per day in Kg)

The following are being emphasized during audit of waste management:

a) Name of the waste

b) Category of waste

c) Quantity of waste

d) Hazardous effect of the waste

e) Institutional action and mechanism for waste management

Compliance audit of waste issues:

At the present stage the institute is capable in managing their waste. They are complying with the essential requirements of waste management although suggestions are given for future improvements.

Performance Audit of Waste Issues:

No critical audit issue is there with respect to the waste management.

Implemented wastes management		
Sl.no	Factors/Indicators	Weightage
1	Plastic and Polythene free	H
2	Re-use of papers	H
3	Hazardous effect waste management	M
4	Removal of E-Wastes	M
5	Organic & food waste	M
6	Others solid wastes	M

* H denote- Taken management policy level above 60%
** M denote- Taken management policy level 40%-60%
*** L denote-Taken management policy level below 40%

3.6 Auditing for Biodiversity & Green Campus Management:

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of Carbon dioxide from the atmosphere, and release it as Oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus

impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress.

41.2% area is under greenery and biodiversity zone. The university campus is highly biodiversity rich area. So, it is a local biodiversity hotspot in Midnapore urban center. Biodiversity includes the genetic variability and diversity of life forms such as plants, animals, microbes etc. living in a wide range of ecosystems. Flora and fauna of Vidyasagar University is rich.

Table 11 Area Coverage of the University Campus

Area Coverage of University Premises	Area in Percentage
Building and Construction	33
Vegetation Cover	41.2
Playground and fallow land	25.8

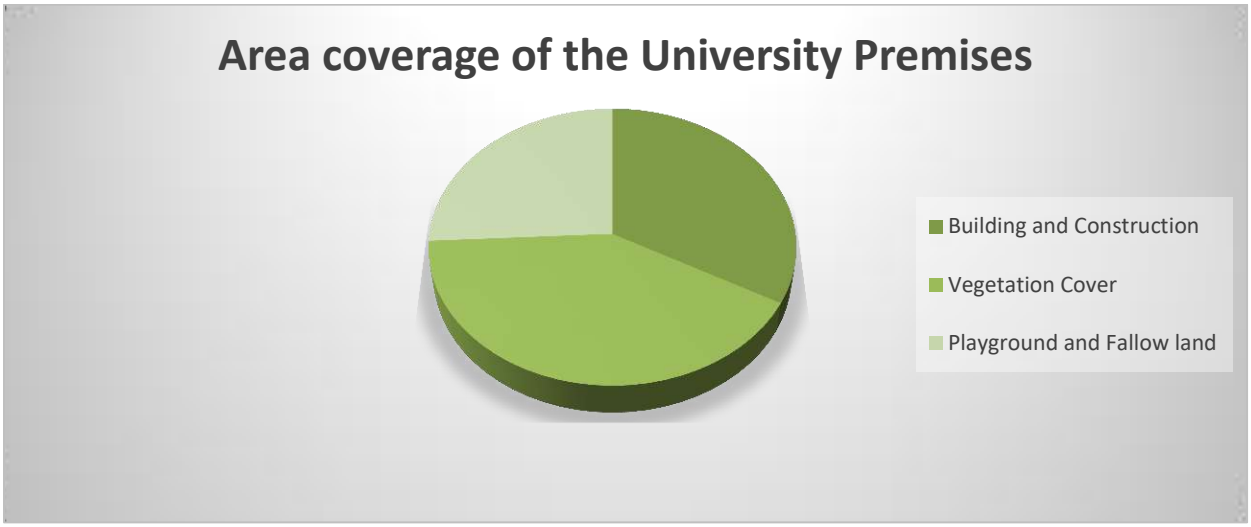


Fig. 10 Area coverage of the University Premises

Table 12 **Name of the Plants Species and their Characteristics**

Tree Quadrat (10m x 10m)

Sl. No.	Scientific name	Local Name	Family	GBH (in cm)	Height (in m)
1.	*Brideliaretusa*	Cosoi	Euphorbiaceae	35	7
2.	*Cassia sena*	Sena	Fabaceae	105	12
3.	*Cassia sena*	Sena	Fabaceae	79	10
4	*Cassia sena*	Sena	Fabaceae	73	10
.5.	*Litsealancefolia*	Piplus	Lauraceae	35	7
6.	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	93	9
7.	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	94	9
8.	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	89	9
9.	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	88	9
10.	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	92	9
11	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	55	7
12	*Pertophoruminerme*	Radhachura	Caesalpiniaceae	41	6

Sl. No.	GBH Class (in Cm)	No. of Trees	Carbon Stock(Kg)
1	25 – 50	3	318
2	51 – 75	2	774
3	76-100	6	4008
4	101 - 125	1	1316

Shrub quadrat (5m x 5m)

Sl. No.	Scientific name	Family	Number of individuals
1.	*Clerodendroninfortunatum*	Verbenaceae	9
2.	*Hemidesmusindicus*	Asclepiadaceae	2
3.	*Lantana camara*	Verbenaceae	2
4	*Peltophoruminermae*	Caesalpiniaceae	8
.5.	*Phoenix acualis*	Arecaceae	1
6.	*Spilanthus sp.*	Asteraceae	52
7.	*Stephaniaharnandifolia*	Menispermaceae	1
8.	*Streblusasper*	Moraceae	1
9.	*Zizyphusoenoplea*	Rhamnaceae	2

Herb quadrat (5m x 5m)

Sl. No.	Scientific name	Family	Number of individuals
1	*Achyranthesaspera*	Amaranthaceae	2
2	*Desmodiumtriflorum*	Fabaceae	3
3	*Evolvulusalsinoides*	Convolvulaceae	3
4	*Perotisindica*	Poaceae	16
5	*Vernoniacinerea*	Asteraceae	2
6	*Zorniadiohylla*	Fabaceae	2

Biodiversity Habitat Area

Table 13 Green Coverage of the University Premises

Green Coverage of the University Premises	Area in Percentage
Native and Natural Vegetation	30.3
Plantation	28.1
Agro-Plants	32.3
Medicinal Plants	9.3

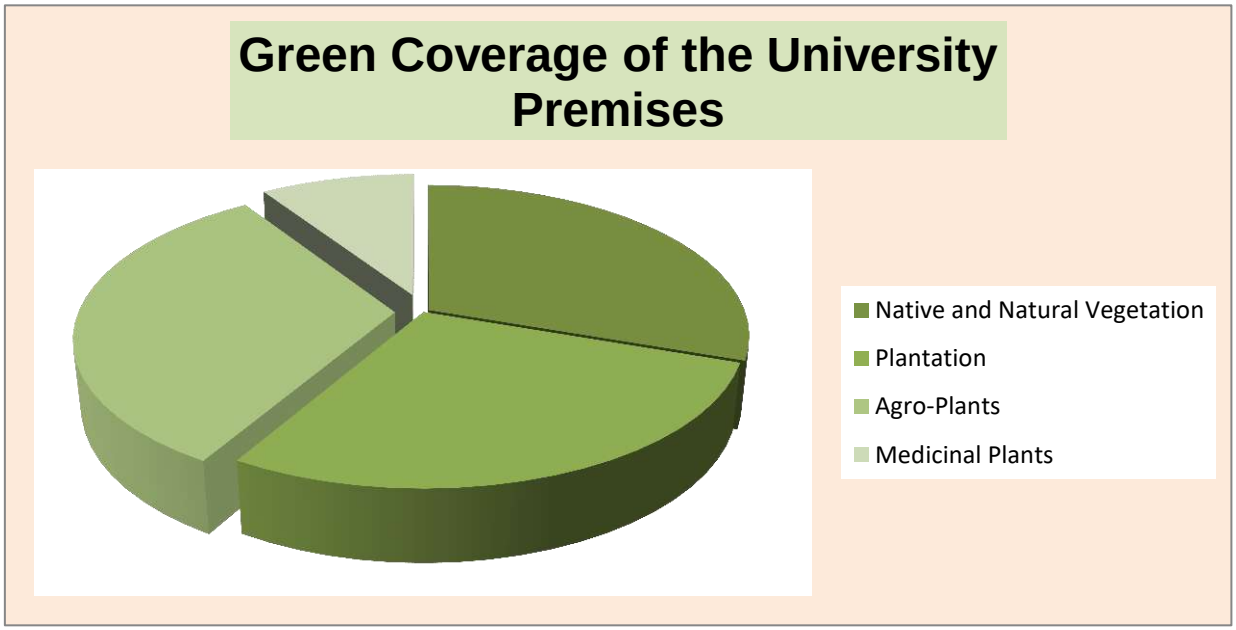


Fig. 11 Green Coverage of the University Premises

FAUNAL DIVERSITY IN AND AROUND THE UNIVERSITY CAMPUS

Various types of invertebrates belonging to diverse orders were observed during the study. The list is given below:

1. Various Mosquitoes.
2. Cockroach (Periplanetaamericana).
3. Ants like Camponotus, Diacamma, Tetraponera etc.
4. Ladybird and Redwing beetle etc.
5. Common Dipteran flies belonging to Family Muscidae, Sarcophagidae, Calliphoridae etc.
6. Dragonflies and Damselflies.
7. Hymenopterans like Wasp, Honey Bee etc.
8. Jumping and Long-legged Spiders.
9. Orthopterans like Grasshoppers, Crickets etc.
10. Various types of butterflies.

Biodiversity counting

Table 14 The Avian fauna observed in the campus is enlisted below-

SL. NO.	COMMON NAME	BENGALI NAME	SCIENTIFIC NAME	IUCN STATUS
1	Red Whiskered Bulbul	Sipahi Bulbul	*Pycnonotusjocosus*	LC
2	Red Vented Bulbul	Bulbul	*Pycnonotuscafer*	LC
3	House Sparrow	ChotiCharai	*Passer domesticus*	LC
4	Eurasian Collared Dove	Par ghughu	*Streptopeliadecaocto*	LC
5	Oriental Turtle Dove		*Streptopaliaorientalis*	
	Spotted Dove	Chhiteghughu	*Streptopeliachinensis*	DD
6	Rock Dove	Rock Pigeon	*Columba livia*	LC
	Black Drongo	Finga	*Dicrurusmacrocercus*	LC
7	Asian Pied Starling	GuyeSalik	*Sturnus contra*	LC
8	White-breasted Kingfisher	SandabukMachhranga	*Halcyon smyrnensis*	VU
9	Common Kingfisher	ChottoMachhranga	*Alcedoatthis*	LC
10	House Crow	Kak	*Corvussplendens*	LC
11	Jungle Babbler	Chhatare/Satbhai	*Argyastriatus*	LC
12	Black-headed Oriole	BeneBau	*Oriolusxanthornus*	LC
13	Eurasian Golden Oriole	SonaBau	*Oriolusoriolus*	LC
14	Common Myna	Salik	Acridotherestristis	LC
15	Blue Rock Pigeon	GolaPayra	*Columba liviadomestica*	
16	Common Hoopoe	Mohonchura	*Upupaepops*	LC
17	Asian Koel	Kokil	*Eudynamysscolopacea*	LC
18	Rose-ringed Parakeet	Tia	*Psittaculakrameri*	LC
19	Brown Shrike	Karkata	*Laniuscristatus*	LC
20	Indian Treepie	HandiChacha	*Dendrocittavagabunda*	LC

Table 15 The Mammalian checklist is as follows-

SL. NO	COMMONNAME	BENGALINAME	SCIENTIFICNAME	IUCN RED LIST
1	FivestripedPalm Squirrel	Kath Berali	*Funambuluspennantii*	Least Concern (LC)
2	Free-rangingCat	Biral	*Felisdomesticus*	DD
3	Free-rangingDog	Kukur	*Canisfamiliaris*	DD
4	AsianPalmCivet	Bham	*Paradoxurushermaphroditus*	LC
5	FieldRat	MethoIndur	*Bandicotabengalensis*	LC
6	GreyMongoose	Beji	*Herpestesedwardsii*	LC
7	HouseMouse	NengtiIndur	*Musmusculus*	LC
8	Small Indian Civet	Kotas	*Viverriculaindica*	LC
9	Bengal Fox	Fox	*Vulpesbengalensis*	LC
10	Indian gray mongoose	Neul	*Herpestesedwardsii*	LC

Table 16 Amphibia checklist as occurring within the University campus

Sl. No.	Family / Scientific Name	Common Name	Current Status and Remarks
1	**Bufonidae** / *Duttaphrynusmelanostictus*	Common Indian toad	Present, Seen commonly in monsoons, and rarely even in dry seasons
2	**Bufonidae** / *Duttaphrynusstomaticus*	Marbled toad	Not recorded
3	**Dicroglossidae/** *Hoplobatrachustigerinus*	Indian bull frog	Present. Seen during and after rains in monsoon.
4	**Dicroglossidae/** *Euphlyctiscyanophlyctis*	Indian skipper frog	Present, Often seen at the edge of bodies of water with their eyes above the water.
5	**Microhylidae/***Uperodontaprobanicus* (Parker, 1934)	Painted balloon frog	Present, Seen commonly in monsoons, and also even in dry seasons
6	**Microhylidae/** *Hylaranatytleri* (Theobald, 1868)	Yellow stripped frog	Present. Seen during and after rains in monsoon.
7	**Rhacophoridae/** *Polypedates sp.* (Gray, 1838)	Common Indian Tree Frog	Present. Seen during and after rains in monsoon in house wall and tree.

Table 17 The Reptilian faunas are observed below-

S. No.	Oder	Common Name	Scientific Name	IUCN Status
1	Squamata	Stripped keelback	*Amphiesmastolatum* (Linnaeus, 1758)	NE
2	Squamata	Common Kukri	*Oligodonarnensis* (Shaw, 1802)	NE
3	Squamata	chcekeredkeelback snake	*Fowleapiscator* (Schneider, 1799)	NE
4	Squamata	Monocled cobra	*Najakaouthia* (Lesson, 1831)	LC
5	Squamata	Spectacled cobra	*Najanaja* (Linneaus, 1758)	LC
6	Squamata	Common krait	*Bungaruscaeruleus* (Schneider, 1801)	NE
7	Squamata	Russell's viper	*Daboiarusselii* (Shaw &Nodder, 1797)	NE
8	Squamata	Indian Garden lizard (Girgiti)	*Calotesversicolor* (Daudin, 1802)	NE
9	Squamata	Indian house gecko (Tictiki)	*Hemidactylusflaviviridis* (Ruppel, 1840)	NA
10	Squamata	Spotted house gecko	*Hemidactylusparvimaculatus* (Deraniyagala, 1951)	NA
11	Squamata	Jerdon Snake eye	*Ophisopsjerdonii* (Blyth,1853)	LC
12	**Testudine**	Indian flapshell turtle Lissemys punctate (Peter's,1854)	*Lissemys punctate* (Peter's,1854)	LC

*NE: Not evaluated; LC: Least concerned; NA: Not accessed

Implemented Biodiversity & Green Management		
Sl. No	Factors/ Indicators	Weightage
1	Plants Diversity	H
2	Birds and Insects	H
3	Mammals	M
4	Amphibian	M
5	Mushrooms & Organisms	M

* H denote- Taken management policy level above 60%
** M denote- Taken management policy level 40%-60%
*** L denote-Taken management policy level below 40%

3.7 Reviews of Documents and Records:

Documents such as admission registers, registers of Engineering and water charge remittance, furniture register, laboratory equipment registers, purchase register, audited statements, and office registers were examined and data were collected. University calendars, university magazines, annual report of the university and NAAC self-assessment reports, UGC report etc. were also verified as part of data collection.

3.8 Review of Policies:

Review of Policies
Discussions were made with the University management regarding their policies on environmental management. Future plans of the University were also discussed. The management would formulate a revised environment /green policy for the university in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are to be in accordance with the Green Policy adopted by the institution.

3.9 Interviews:

In order to university information for green auditing different audit groups which are IQAC Cell, Deputy Registrar, Dean of Student Welfare, and Director DDE, Dept. HOD, Teaching and non-teaching staff, students, Students Union, parents and other stakeholders of the University. Discussions were also made with the PTA office bearers to clarify doubts regarding certain points.

4.0 POST AUDIT STAGE :

4.1. Data Analysis and Assessment :

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner. Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time.

Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components are crucial in ensuring that the organization's environmental performance meets the goals

set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the organization's environmental performance.

4.2 Results and Findings:

a) Water -

Water Audit and Assessment (Vidyasagar University):

Sl. No.	Object and Parameter	Observation and Finding
1	Source of water	➢ Underground ➢ Surface water bodies
2	Capacity of water storage (Daily)	➢ Underground reservoir and Overhead tanks-42000 Gallon liter ➢ Surface water bodies – 40 Sq meter
3	Amount of used water per day	40000 Gallon liter
4	Misuse of water in daily	Leakage and Misuse-1746.36 liter
5	Maximum used of water per day - Clinging and Gardening purpose	17.2% (26006.4 liter)
6	Amount of water for used per day-Drinking Purpose	18.3% (27669.6 liter)
7	Number of Rain Water Harvesting unit	4 (4000 liter)
8	Installation of water reuse units	Nil
9	pH level of drinking water	7.1-7.2
10	TDS level of drinking water	120 ppm -160 ppm
11	Number of surface water bodies	1(40 Sq meter)

b. Energy-

❖ Electricity Consumption -719237 Unit, Total Cost- Rs.-6788972/- Per Year

a) Conventional energy-614012Unit
b) Nonconventional energy-105225 Unit Less-Rs.1162736.25/ .Rs. for Paid-Rs.-6788972/

❖ Fossil fuel consumption per Year:

a. Number of Gas cylinders used for cooking purpose(Hostels& Canteen) – 324PC
b. Number of Gas cylinders used in Chemistry Laboratory - 2PC
c. Diesel used for green Generater-1300 liter

❖ Number of Green Generators - 4

❖ Cost of generator fuel – Rs.110500 /year

Energy Audit and Assessment (Vidyasagar University)

Sl. No.	Object and Parameter	Observation and Finding
I.	Source of energy (conventional)	90.8%
II.	Source of energy (Non-conventional)	Solar-9.2%
III.	Total consumption of Electric Power	719237unit
IV.	Maximum energy consumption in the purpose	Light and fans - 374003 unit AC- 58977unit
V.	Energy Consumption in Computer & Lab.	107885 unit
VI.	No. of LPG Gas cylinder for coking purpose	324
VII.	No. of LPG Gas cylinder used in Laboratories	2
VIII.	Amount of diesel used for green generator	1300 liter
IX.	No. of Computers and use of energy	820 (246 Kwh/Day)
X.	No. of AC and use of energy	370(166.5 Kwh/Day)
XI.	No. of Street sodium vapor light	1600(2880Kwh/Day)

Energy consumption in different purpose, 2021-22		
1	Lights & Fans	374003 unit
2	Air Condition	58977 unit
3	Lifting of water(HP pump)	79116unit
4	Computer & Dept. Lab	107885 unit
5	Others(CCTV,TV, water cooler & others)	99254unit

c. Wastes-

- Total Students -3890 persons
- Other Stakeholders – 395persons
- Total Stakeholders -4285persons
- Departments – 27
- Student Hostels & Staff Quarters - 8
- Office Building – 5
- Guest house -2
- Canteen- 2

Type of Wastes & Management:

- E-wastes- computers, electrical and electronic parts – Disposal by selling
- Plastic waste- disposal by selling
- Solid wastes – Damaged furniture, Iron & Metal scraps- Disposal by Selling
- Food wastes – Waste Rice, Vegetable, Paper plates- Disposal to municipal waste Collection centers.
- Chemical wastes – Laboratory waste – No treatment
- Waste water – washing, urinals, and bathrooms in soak pits
- Glass waste – Broken glass wares from the labs to municipal waste
- Collection centers.
- Napkin & Clothes incinerators- Disposal to municipal waste Collection centers.

Waste Audit and Assessment (Vidyasagar University)

Sl. No.	Object and Parameter	Observation and Finding
1	Degradable waste	420 (Kg/Day)
2	Non degradable	17(Kg/Day)
3	Source of waste (Organic)	Canteen and Garden
4	Source of waste (Chemical Waste)	Zoology Lab., Chemistry Lab., Botany Lab. and Geography Lab.
5	Plastic waste management	Use of separate dustbin and Established of different waste counter
6	Organic waste management	Not treatment properly

d) Green Campus-

Total number of plant species identified – more than 230 species.

Green cover of the campus – 56.85acre area

Free space including Playground- 39 acre area

Crops cultivated in the campus:

Banana, Tapioca, Chilly, Cabbage, Tomato, Spinach, Brinjal, Cauliflower, Ladies finger, Pea and different seasons flowers are produced during different seasons in Hostels and Quarters

Green zone

Kitchen garden and University premises area.

Table 18 Biodiversity and Green Coverage (Vidyasagar University)

Sl. No.	Object and Parameter	Observation and Finding
1	Vegetation coverage area	41%(56.90 Acre)
2	Types of green coverage	➢ Native and Natural Vegetation-30.3% ➢ Medicinal plants-9.3% ➢ Agro-plants-32.3%
3	Different types of Animal	➢ Mammals -Squirrel, Rat, Free ranging Cat, Free ranging Dog, Field Rat, Asian Palm Civet, Grey Mongoose, Bengal Fox, Indian Grey Mongoose etc. ➢ Amphibian-Snake, Frogs ➢ Birds- Crow, Common Moyna, Bat, Pigeon, etc. ➢ Insects- Ants, Butterfly, Spider etc.
4	Biodiversity and Green Management Programme	➢ Awareness program arrange by- Dept. of Geography, Dept. of Zoology and Dept. of Botany among the students and Stuff through the year ➢ Observation and celebration of environmental days ➢ Installation of Honey farm ➢ Installation of different trees and plants naming plate

Table 19 Green Coverage of the University Premises

Green Coverage of the University Premises	Area in Percentage
Native and Natural Vegetation	30.3
Plantation	28.1
Agro-Plants	32.3
Medicinal Plants	9.3

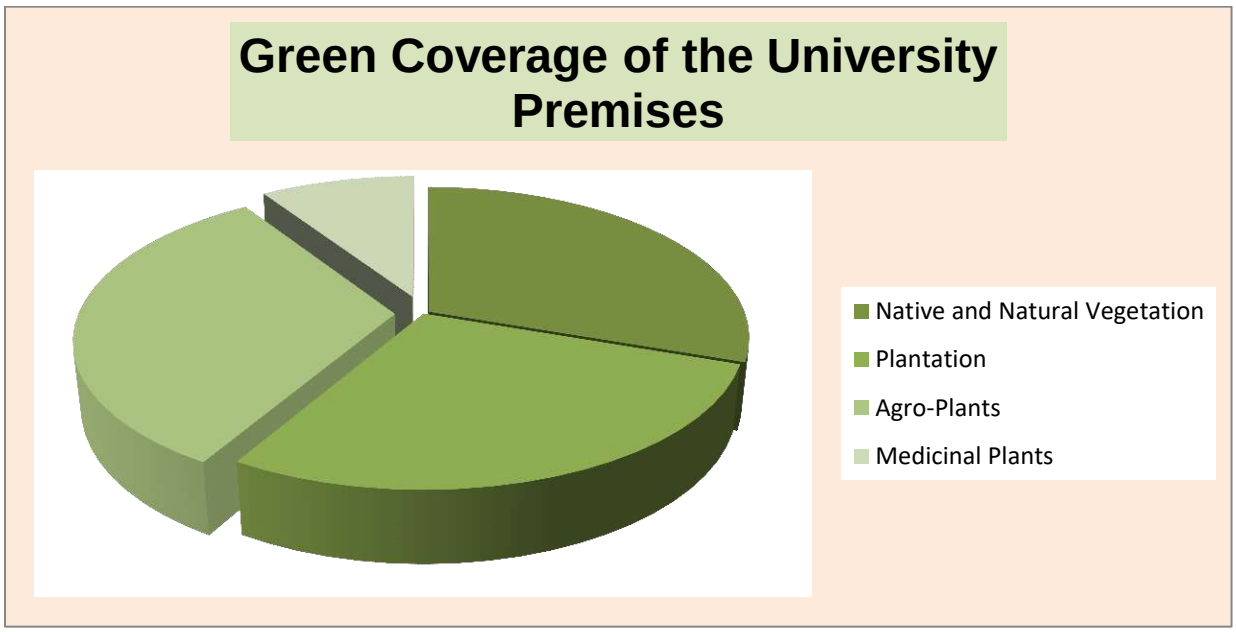


Fig. 12 Green Coverage of the University Premises

Campus farming

Organic vegetable cultivation as interim crop is another plan to be materialized soon. The university has also cultivated of Cashew in the backyard of the campus.
The department of Botany has been consistently undertaking Honey, vegetable cultivation of monsoon, winter and summer crops and conducting the sale of the products among the community.

Habited Area of Biodiversity

Table 20 The Reptilianfaunas are observed below-

S. No	Oder	Common name	Scientific name	IUCN Status
1	Squamata	Stripped keelback	*Amphiesmastolatum* (Linnaeus, 1758)	NE
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10	Squamata	Spotted house gecko	*Hemidactylusparvimaculatus* (Deraniyagala, 1951)	NA
11	Squamata	Jerdon Snake eye	*Ophisopsjerdonii* (Blyth,1853)	LC
12	**Testudine**	Indian flapshell turtle Lissemys punctate (Peter's,1854)	*Lissemys punctate* (Peter's,1854)	LC

*NE: Not evaluated; LC: Least concerned; NA: Not accessed

The **butterfly diversity** of the University campus deserves mention. A detailed study on the morphology, habitat and distribution of the butterflies was carried out. The results are summarized in the given below:

1. CommonTiger(*Danauschrysippus*)
2. Commonlime(*Papiliodemoleus*Linnnaeus)
3. CommonMormon(*Papiliopolytes*Linnaeus)
4. Greypansy*(Junoniaatlites*Linnaeus)
5. Tawnycoster (*Acraeaviolae*Fabricius)
6. CommonPierrot(*Castaliusrosimon*Fabracius)
7. StripedTiger (*Danausgenutia)*
8. CommonGrassYellow(*Euremahecabe*)
9. AngledCastor(*Ariadne ariadne)*
10. Psyche(*Leptosianina)*
11. CommonCrow(*Euploea core)*
12. CommonMormonFemale(*Papiliopolytes)*
13. BlueJay(*Graphiumdoson)*
14. SpotSwordTail(*Graphiumnomius)*
15. CommonJezebel *(Delias eucharis)*
16. CommonAlbatross (*Appiasalbina)*

17. CommonFourRing(*Ypthimahuebneri*)
18. GramBlue(*Euchrysopscnejus)*
19. Peacockpansy(*Junoniaalmana*)
20. MottledEmigrant(*Catopsiliapyranthe)*
21. CommonFive Ring(*Ypthimabaldus*)
22. LemonPansy(*Junonialemonias*)

Species Observation and Plants Diversity counting

Routine Green Practices

The Green campus drive is an initiative of the University to protect the Environment. The University Authority has decided to declare 'No Plastic' & No Smoking' in the campus. The campus protects age old trees in addition to several new trees and plants planted. The campus is lush green with gardens, lawns, flowers and plants wherever there is open space. Rain water is harvested and collected in the well in front of the university.
World Forest Day-21st March, World Water Day-22nd March, World Earth Day- April 22, World Biodiversity Day- May 22,World Environment Day – June 5, Ozone Day – September 16
Distribution of fruit trees, poster exhibitions etc. are some activities performed on that day. University conducted poster competition, Invited lectures etc and also University has been following the policy of 'Save water save earth'
There are two ponds at the far end of the university ground to harvest water. Bio-degradable waste is collected and made into compost. Non-degradable and electronic waste and toxic materials are regularly disposed of. The Nature club of the college has

named all the flora of the campus. Important days like World Environment Day, Ozone Day, and Hiroshima Day etc are observed and several programmes including processions with placards, competitions and street plays are conducted by various departments and the Nature Club works to create awareness on environment protection and conservation. The department of Zoology and Geography regularly conduct quiz and awareness programme on Plastic pollution and Biodiversity.

e) Carbon Footprint-

- Number of Students & Staff using cycles – 250
- Number of persons using cars – 22
- Number of persons uses two wheelers – 150
- Number of students uses Buses - 85
- Number of persons using other transportations – 2835
- Number of visitors per day – 43
- Number of Students staying in the hostel – 632
- Number of Faculty and staff staying in the quarters – 46
- Average distance travelled by stake holders – 6X2 kms /day
- Expenditure for transportation per person per day – Rs.60/-

4.3 Consolidation of Audit Findings:

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

4.4 SUMMARY:

I. There is Nature club of the University towards its environmental performance for Community development.
II. Indoor air quality of the laboratories is very uncomfortable and inhospitable.
III. Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
IV. The University campus is plastic free and maintained the outdoor air quality.
V. The installation of solar panels, Fire extinguishers training, organic vegetable cultivation, Vermi composting practices are inadequate.
VI. Programs on green initiatives have to be increased. Campus is declared "Green Campus"
VII. Fully carbon foot prints and wastes free zone actions should be taken to maintain this.
VIII. Rain water harvesting systems, solar power generation, Bio Gas, Re-use of water environmental education programs have to be fully explored.

Implemented Air Quality management		
Sl No	**Indicator**	**Weightage**
1	Carbon & Smoke free	H
2	Exhaust fans &Ventilation	M
3	Emission of GHGs	H
4	Indoor Plants	M

* H denote- Taken management policy level above 60%
** M denote- Taken management policy level 40%-60%
*** L denote-Taken management policy level below 40%

Major Audit Observations		
Sl. No	**Sectors/Indicators**	weightage
1	Water efficiency Audit	M
2	Energy efficiency Audit	M
3	Air Quality & Carbon foot print Audit	H
4	Wastes Audit	M
5	Green & Biodiversity Audit	H

* H denote- Taken management policy level above 60%
** M denote- Taken management policy level 40%-60%
*** L denote-Taken management policy level below 40%

Plants diversity Observation

Rain Water harvesting unit

4.5 Environmental Education:

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

- ❖ Increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- ❖ Activate the nature or green clubs
- ❖ Set up Organic vegetable garden, medicinal plant garden, Honey farm, Mushrooms, Indigenous fish farm etc. for providing proper training to the students.
- ❖ Conduct exhibition of recyclable waste products
- ❖ Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, paddy cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and rain water harvesting and water re-use methods
- ❖ Implement chemical treatment system for waste water from the Laboratories.

4.6 Awareness on Carbon Consumption:

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

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4.7 Common Recommendations

- ✓ Students and staff can be permitted to solve local environmental problems
- ✓ Renovation of cooking system in the canteen to save gas
- ✓ Establish water, waste and energy management systems
- ✓ Adopt an environmental policy for the university
- ✓ Establish a purchase policy for environmental friendly materials
- ✓ Introduce UGC Environmental Science course to all students
- ✓ Conduct more seminars and group discussions on environmental education

4.8 Criteria Wise Recommendations

Water Audit

- ➢ Establish the re-use water management methods.
- ➢ Establish rain water harvesting systems for each building.
- ➢ Establish the more surface water bodies in the Hostel & staff quarters area.
- ➢ Establish water treatment systems
- ➢ Remove damaged taps and install sensitive taps is possible.
- ➢ Drip irrigation for gardens and vegetable cultivation can be initiated.

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Energy Audit

- ✓ More energy efficient fans, tubes and bulb should be replaced.
- ✓ Automatic power switch off systems may be introduced.
- ✓ Employment of more solar panels and other renewable energy sources.
- ✓ Conduct more save energy awareness programs for students and staff.
- ✓ Replace computers and TVs with LED monitors.

Waste Audit

- ❖ A model Vermi composting plant to be set up in the Hostels, canteen and Quarters of university campus.
- ❖ Establish a Regular functional bio gas plant.
- ❖ Practice of waste segregation to be initiated.
- ❖ Establish of a unit for chemical liquid wastes and Hazardous waste management

Green Campus Audit

- ✓ Develop the Herbal and medicinal plants garden for large area
- ✓ Establish a butterfly park.
- ✓ Establish an Orchid ex-situ zone .
- ✓ Develop the Fruits trees area for Birds conservation
- ✓ All trees in the campus should be named scientifically.
- ✓ Create more space for planting in vacant land.
- ✓ Grow potted indoor plants at verandah, class rooms and Laboratories.

- ✓ Providing funds to nature club for making campus more green
- ✓ Encouraging students not just through words, but through action for making the campus green

Carbon footprint Audit

- ❖ Establish the indoor plants in computer lab and other laboratories to CO_2 management
- ❖ Providing more university bus services to the students and staff.
- ❖ Encourage students and staff to use cycles.
- ❖ Establish a more efficient cooking system to save gas
- ❖ Establish a system of carpooling among the staff and visitors to reduce the number of four wheelers coming to the university.

Indicator of saving water

Executive Summary: 2021-22

Environmental Audit is a process of systematic, documented, periodic and objective evaluation of components of environmental diversity with the aim of safeguarding the environment and natural resources. The process starts with the systematic identification, quantification, recording, reporting and analysis of components of environmental diversity and is a means of assessing environmental performance (Welford, 2002). It aims to analyze environments within and outside of the concerned area, which will have an impact on the eco-friendly atmosphere. Green and Environmental audit is a valuable means for an institution to determine how and where they are using the most resources; the institution can then consider how to implement changes and take necessary management measures. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of green impact on their area of work. Environmental auditing and the implementation of mitigation measures is a win-win situation for the institution, the learners and the planet. It can also create health consciousness and promote to holistic approaches to environmental management, awareness, values and ethics. Green and Environmental auditing promote financial savings through efficiency of resource usage. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the institute evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

In Vidyasagar University, Midnapore, W.B the audit process involved initial interviews with the teachers and staffs to clarify policies, activities, records and the cooperation in the implementation of mitigation measures. This was

followed by collection of data through the questionnaires, review of records, observation and enquiry of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the Green and Environmental auditing process. The baseline data prepared for the Vidyasagar University, Midnapore will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development. Existing data will allow the College to compare its programmers and operations with those of peer institutions, identify areas in the need of improvement, and prioritize the implementation of future projects.

The area of the University premises is 138.78 acre out of which about 103.74 acre areas is covered by Main Campus and 35.04acre areas is covered by Residential Campus and also 57.18 acre area has covered with plants diversity. In the present audit report most of the aspects are covered such as tree plantation, awareness about environment programmers, rain water harvesting and plastic free premises. The University has already taken some steps to protect the environment with help of teachers, staff and students under the guidance of Prof. (Dr.) Sibaji Pratim Basu, Hon'ble Vice-Chancellor, Vidyasagar University,Midnapore. We expect that the management will be committed to implement the green and environmental audit recommendations. We are happy to submit this green and environmental audit report to the Vidyasagar University, Midnapore, W.B.

ENERGY AUDIT

(2021-22)

VIDYASAGAR UNIVERSITY, MIDNAPORE, WEST BENGAL

CONSULTRAIN MANAGEMENT SERVICES,
LAKE ROAD, KOLKATA

TROPICAL INSTITUTE OF EARTH & ENVIRONMENTAL RESEARCH (TIEER),
MIDNAPORE

CONSULTRAIN MANAGEMENT SERVICE
Lake Road, Kolkata, West Bengal, India

TROPICAL INSTITUTE OF EARTH AND ENVIRONMENTAL RESEARCH (TIEER)
Reg. No. S/1L/42578 of 2006-07
Office address: M-10, Bidhannagar, Medinipur-721101, W.B., India

ENERGY AUDIT CERTIFICATE

Academic Year: 2021-2022

This is to certify that Vidyasagar University, Midnapore, West Bengal has good and healthy eco-friendly environment created for saving Earth and Nature. Tropical Institute of Earth and Environmental Research associated with Consultrain Management Service are satisfied after successful completion of Energy Audit with moral support of Honorable Vice Chancellor, IQAC Team, Staff and Students for academic year 2021-2022. This efforts taken by Faculty and Students towards environment and sustainable development, which are highly appreciable and commendable.

(Dr. Binoy Kr. Chanda)	(Dr. Pranab Sahoo)	(Mrs. Sanchita Bhattachariya)	(Mr. Ananda Kr. Das)
President, TIEER	Asst. Professor & Secretary, TIEER	ISO-Auditor& CEO, CMS	Expert & Member, TIEER

LIST OF EXPERTS AND SCIENTISTS

SL.No.	NAME	DESIGNATION	AREA IN INTEREST
1.	Dr. Binoy Kr. Chanda	President, TIEER & Former IC, VU	Environment Science & Climatology
2.	Dr. PranabSahoo	Secretary, TIEER & Assistant Professor and HOD, Dept of Geography, S.B. Mahavidyalaya, Kapgari	Climate Change and Environment Management, Carbon Stocking and Biogeography
3.	Mrs. Sanchita Bhattachariya	ISO Auditor(9001, 14001, 50001) CEO, Consultrain Management services, Kolkata	Environment management Service
4.	Dr. SK MafizulHaque	Assistant Professor in Geography, CU & EC, Member, TIEER	Climate Change and Environment Management and RS-GIS Techniques
5.	Prof. Koushik Chatterjee	Assistant Professor , Dept of Commerce & Management , Sent Xavier's College, Kol	Management service
6.	Sri Amal Sasmal	Consultant, EIA and EMS	Environmental management
7.	Dr. Chandan Karan	Faculty, Dept. of Geography, S.B. Mahavidyalaya, Kapgari & EC,Member, TIEER	Land use Survey, Technician for Lab test. and Map Designer
8.	Dr. Suvendu Ghosh	Assistant Teacher in Geography & Asst, Secretary, TIEER	Soil Management and Environment Management
9.	Sri Ananda Das	Assistant Teacher in Physics & Member , TIEER	Solid state Physics and Mechanical & Electrical low cost model
10.	Sri Achiransu Sengupta	Electrical Engineer & Member , TIEER	Machine & Power system
11.	Sarat Chatterjee	Surveyor & Member , TIEER	Air quality and carbon footprint measurement

Aerial view of the University Campus

Meeting with IQAC Coordinator

CONTENTS :

CHAPTER-1

1.0 INTRODUCTION

Energy Audit is a process of systematic, documented, periodic and objective evaluation of components of Energy sources with the aim of safeguarding the environment and natural resources in its operations. The process starts with systematic identification, quantification, recording, reporting and analysis of components of Energy sources in the university. Energy auditing is a means of assessing environmental performance (Welford, 2002). It is as systematic, documented, periodic, and objective review by regulated entities of facility operations and practices related to meeting environmental requirements (EPA, 2003).

1.2 Objectives of energy auditing:

The objectives of Energy Auditing are to assess a resource and fossil fuel utilization aids effective learning and provides a learning Resource management.

- To study of interrelationship between beneficiary and environment in the University campus
- To Establish to provide basis for improved sustainability
- To Recognize the cost saving methods through energy minimizing and managing
- To Financial savings through a reduction in resource use
- To Develop of ownership, personal and social responsibility for the University and its environment and resource

1.3 Advantages of Energy Audit:

- To develop to more efficient resource management
- To provide basis for improved sustainability
- To create a GHG free campus

Campus Area and Infrastructure

Total area of the university campus – 138.78 acres,
Main campus – 103.74 acres,
Residential campus - 35.04 acres.

MAIN CAMPUS CONSISTING	RESIDENTIAL CAMPUSCONSISTING
Administrative building	Vice Chancellor Bungalow
DDE Building with Guest House	V.I.P Guest House
Science building	Student Amenities Center
Humanities Building	P.G Girls Hostel (2 Blocks)
Silver Jubilee Building	Teacher & Officers Hostel (2 Blocks)
Central Library	Teacher Quarter (2 Blocks)
P.G Boys Hostel(2- Blocks)	Non Teaching Staff Quarter (2 Blocks)

Non-teaching Staff hostel (2 Blocks)
Women Infrastructure
Sports complex with Pavilion
Tribal cultural Building
Electrical Sub Station
Over Head Water Reservoir with deep tube well (4 Nos) & Pump House

Table 1. Area Coverage of the University Campus:

Area Coverage of University Premises:	Area in Percentage
Building and Construction	33
Vegetation Cover	41.2
Playground and fallow land	25.8

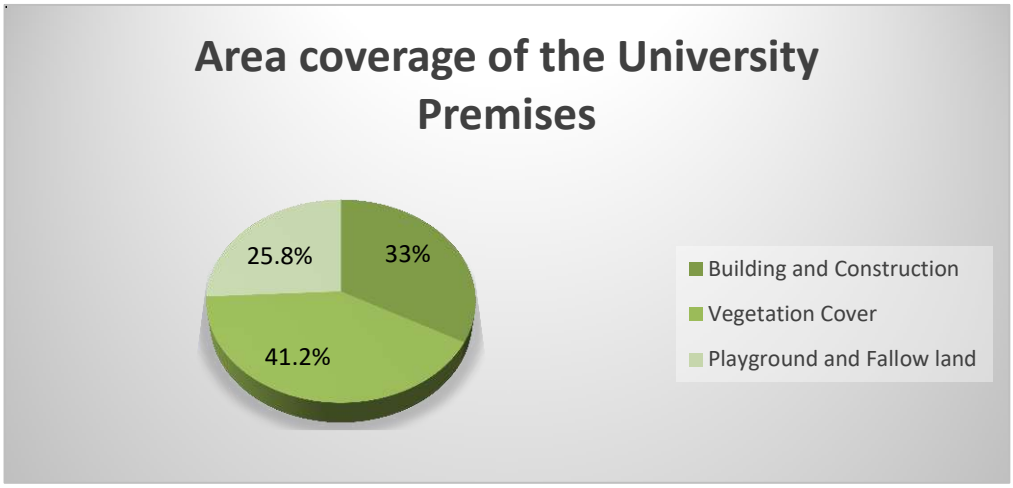


Fig. 1 Area Coverage of University Premises

Academic Department and Research Centre

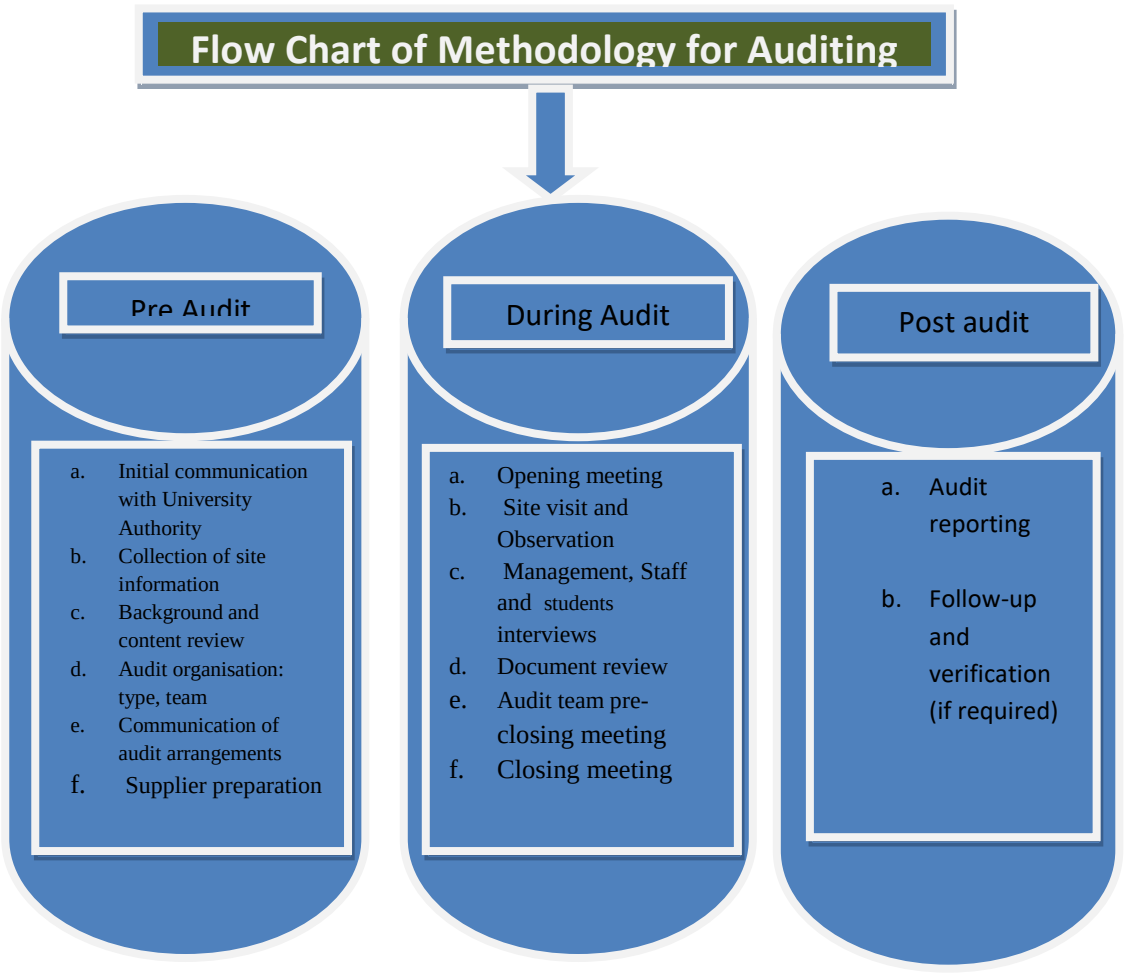
Academic Departments		Research Centre
Bengali	**Anthropology**	**Centre for Environmental Studies (CES**
Business Administration	**Applied Mathematics with Oceanology and Computer Programming**	**Centre for Life Sciences**
Commerce with Farm Management	**Aquaculture management & Technology**	**Gandhian Studies Centre**
Economics with Rural Development	**Bio-Medical Laboratory Science & Management**	**Women's Studies Centre**
English	**Botany and Forestry**	**Centre for Adivasi Studies and Museum**

Hindi	**Chemistry& Chemical Technology**
History	**Computer Science**
Library and Information Science	**Electronics**
Philosophy& Life world	**Geography& Environment Management**
Political Science with Rural Administration	**Human Physiology with Community Health**
Sanskrit	**Microbiology**
Santali	**Physics &Techno-physics**
Sociology	**Remote Sensing and GIS**
	Zoology

CHAPTER – 2

Methodology and Survey Schedules

The methodology is adopted for this Assessment by collecting the information by Onsite visit, group discussion, Campus survey, Enquiry, Observation, Perception study and opinion also included in the Auditing Report.



Schedule of Audit Programming-2021-2022

SL.NO	PURPOSE	DATE	REMARKS
1.	Communication with university authority	28th Aug,2021	Discuss about term and condition
2.	Opening Meeting	4th Sep.,2021	Submitted the survey schedule
3.	Collection information about the University	11th Sep.,2021	Introduced to Administrative Officer
4.	Campus visit and observation	28th Jan.,2022	Outdoor observation with Drown camera& Photo camera
5.	Interview with staff	11th Feb.,2022	Collected different information
6.	Review data and Assessment	14th Feb., 2022 -28th Feb, 2022	Data generate and drown figures
7.	Pre Closing meeting	11th March, 2022	Meeting with IQAC
8.	Closing Meeting	06th June, 2022	Pre-submission of the Report
9.	Submit audit report	24th June,2022	Submit of the Report

- # Schedule Questionnaire for Energy Audit:

Survey Form for data collection

1. List ways that you use energy in your university. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).
2. Electricity bill amount for the last three year
3. Amount paid for LPG cylinders for last one year
4. Also mention the amount spent for petrol/diesel/ others for generators?
5. Are there any energy saving methods employed in your university? If yes, please specify. If no, suggest some.
6. How much money does your university spend on energy such as electricity, gas, etc. in a month.
7. How many CFL bulbs has your university installed? Mention use (Hours used/day for how many days in a month)
8. Energy used by each bulb per month? (for example- 60 watt bulb x 4 hours x number of bulbs = kwh).

9. How many LED bulbs are used in your university ? Mention the use (Hours used/day for how many days in a month)
10. Energy used by each bulb per month? (kwh).
11. How many incandescent (tungsten) bulbs have your university installed?
12. Mentions use (Hours used/day for how many days in a month)
13. Energy used by each bulb per month? (kwh).
14. How many fans are installed in your university ? Mention use (Hours used/day for how many days in a month)
15. Energy used by each fan per month? (kwh)
16. How many air conditioners are installed in your university? Mention use (Hours used/day, for how many day in a month)
17. Energy used by each air conditioner per month? (kwh).
18. How much electrical equipment including weighing balance are installed your university?
19. Mention the use (Hours used/day for how many days in a month)
20. Energy used by each electrical equipment per month? (kwh).
21. How many computers are there in your university? Mention the use (Hours used/day for how many days in a month)
22. Energy used by each computer per month? (kwh)
23. How many photocopiers are installed by your university? Mention use (Hours used/day for how many days in a month).
24. How many cooling apparatuses are in installed in your university? Mention use(Hours used day for how many days in a month)
25. Energy used by each cooling apparatus per month? (kwh)Mention use (Hours used/day for how many days in a month)
26. Energy used by each photocopier per month? (kwh) Mention the use(l- lours used/day for how many days in a rnonth)how many inverters your university installed? Mentions use (Hours used/day for how many days in a month)

27. Energy used by each inverter per month? (kwh)
28. How many electrical equipment are used in different labs of your university? Mention the use (Hours used/day for how many days in a month)
29. Energy used by each equipment per month? (kwh)
30. How many heaters are used in the canteen of your university? Mention the use (hours used per day for how many days in a month)
31. Energy used by each TV per month? (kwh)
32. Any other item that uses energy (Please write the energy used per month) Mention the use (Hours used per day for how many days in a month)
33. Are any alternative energy sources/nonconventional energy sources employed / installed in your university? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.
34. Do you run ˙switch off drills at university?
35. Are your computers and other equipment put on power-saving mode?
36. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.)run on standby mode most of the time? If yes, how many hours?
37. What are the energy conservation methods adapted by your university?
38. How many boards displayed for saving energy awareness?

Chapter 3.0 : AUDIT STAGE

3.1 Campus Survey and Enquiry

The Audit covered the following major areas:

1. Sources of Energy
2. Consumption of Energy
3. Cost of Energy
4. Measurement of Emission of GHG_S
5. Energy Efficiency and Energy Management

Office Survey & Data collection

3.2 Grouping and Strategy

The following groups were formed with specific target areas and end users assigned.
Group 1: Lighting and fans in Main building, Library and staff canteen

Group 2: Lighting and fans in Departments (all departments, offices, class rooms and labs)
Group 3: Lighting common area – Covering Street lights, corridors, grounds
Group 4: Lighting and fans in boys Hostels
Group 5: Lighting and fans in Girls Hostels and Staff Quarters
Group 6: Total energy audit of DDE Building and Guest house
Group 7: Energy use in Dulung Canteen and Guest canteen
Group 8: Total room air conditioners in Administrative building, departments and labs.
Group 9: Total Energy audit of Central library and Computer Lab.
Group 10: Enquiry of total energy cost from Power Office
Group 11: Water Pumps in the entire campus
Group 12: Benchmarking of electricity consumption

3.3 Source of Energy:

By the enquiry, that the useable energy is Conventional and Non-Conventional energy. The used energy is 719237 unit and payable cost is about Rs.6788972/. Only 9.2% used Energy is Non-conventional energy contributed from Solar Power. About 2500sq ft area is covered by the solar plate.
The Maximum energy is consumed for Light & Fan amounting to 52 % of total consumption.

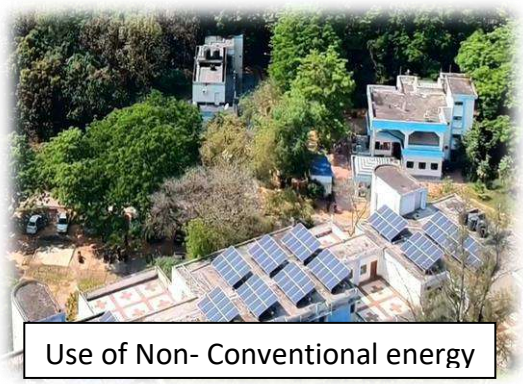

Use of Non- Conventional energy

Table2. Source of Energy in Percentage:

Source of energy	In Percentage
Conventional	90.8
Non -Conventional	9.2

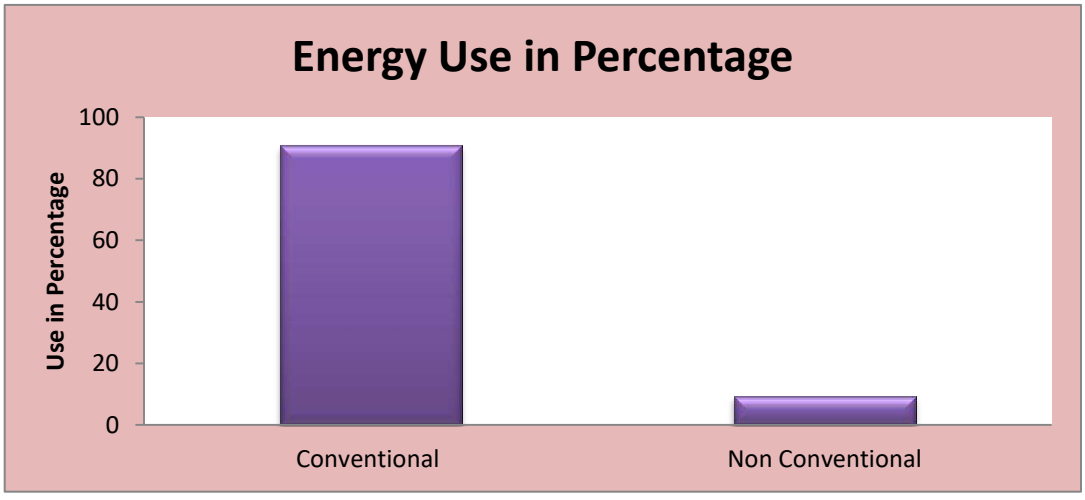


Fig. 2 Use of Energy in Percentage

3.4 Energy Consumption

POWER CONSUMPTION (kWh) OF PARTICULARS:

Sl.no	Particulars	Power consumption per hour
1.	Air Conditionar	1.5kw
2.	Computer	300w
3.	Xerox Machine/Network printer	500w
4.	Inkjet printer	50w
5.	Dot matrix printer	50w
6.	Tube light	40w +20w
7.	Fans	50w
8.	LCD Projector	500w
9.	Water Coolar	200w
10	Chimni for cooking	850w
11	Spot light(CFL)	25w
12	Electric ketle	850w
13	Refregerator	500w
14	Water pump	1kw

Table 3. Energy Consumption of different items (Kwh/day)

Electrical Items	Numbers	Use of energy(Kwh/day)
Computers	820	246
Printers	160	13
Fans	2010	80.4
Exhaust fans	30	1.2
Tubes(Fluorescent)	3500	112
Tubes(LED)	3000	48.0
LCD Projectors	85	85
Refrigerators	38	152
Water Cooler	55	55
Xerox Machines	16	24
AC	370	166.5
Electric Kettle	60	25.5

Sodium Vapor Lamp	02	3.6
CC TVs	32	38.4
Pumps	07	14
LED Bulbs(Streetlight)	1400	8.40
Streetlight-Sodium Vapor	1600	2880

3.5Energy Cost:

❖ ❖Electricity Consumption -719237 Unit, Total Cost- Rs.-6788972/- Per Year

a) Conventional energy-614012Unit
b) Nonconventional energy-105225 Unit Less-Rs.1162736.25/ .Rs. for Paid-Rs.-6788972/

❖ Fossil fuel consumption per Year:

a. Number of Gas cylinders used for cooking purpose(Hostels& Canteen) – 324PC
b. Number of Gas cylinders used in Chemistry Laboratory - 2PC
c. Diesel used for green Generater-1300 liter

❖Number of Green Generators - 4

❖Cost of generator fuel – Rs.110500 /year

Table :-4 Amount of CO_2 (ppm) in different places :

Amount of CO_2 (ppm) in the Air in Different places of the University Premises	**Amount of CO_2 (ppm)**
Outdoor	410
Indoor (Class room)	420
Indoor (Laboratories)	440

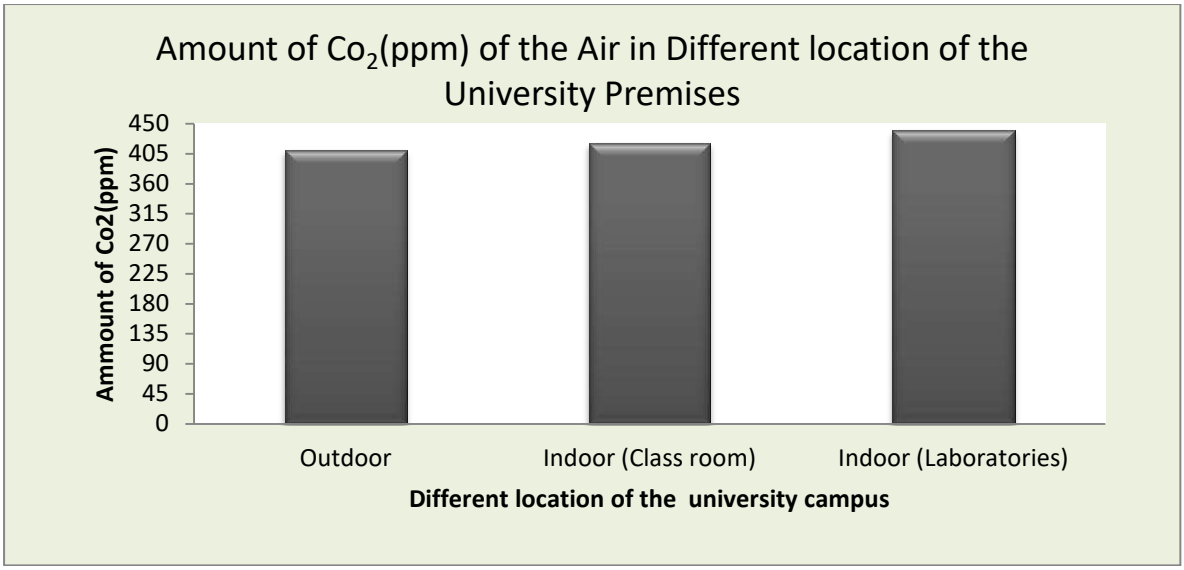


Fig. 3 Amount of Co_2(ppm) of the Air in Different location of the University Premises

CHAPTER : 4.0 POST AUDIT STAGE

4.1 Data analysis and Assessment

Sl. No.	Object and Parameter	Observation and Finding
I.	Source of energy (conventional)	90.8%
II.	Source of energy (Non-conventional)	Solar-9.2%
III.	Total consumption of Electric Power	719237unit
IV.	Maximum energy consumption in the purpose	Light and fans - 374003 unit AC- 58977unit
V.	Energy Consumption in Computer & Lab.	107885 unit
VI.	No. of LPG Gas cylinder for coking purpose	324pc(14kg)
VII.	No. of LPG Gas cylinder used in Laboratories	2 pc(14kg)
VIII.	Amount of diesel used for green generator	1300 liter
IX.	No. of Computers and use of energy	820 (246 Kwh/Day)
X.	No. of AC and use of energy	370(166.5 Kwh/Day)
XI.	No. of Street sodium vapor light	1600(2880Kwh/Day)

4.2 Results and Findings

Tabel:-5 Power Consumption in different sectors:

Sl.no	Sectors and purpose	Power consumption(%)/day
1.	Science Department	10%
2.	Humanities Department	8%
3.	Computer laboratory and library sc	14.3%
4.	Administrative sector	23%

5.	DDE Sector	6%
6.	Commerce and management Department	4%
7.	Hostel and Quarters	11%
8.	Guest House and Canteen	3.5%
9.	Pump and water lifting	1.5%
10.	Street Light	17.5%
11.	Others	1.2%

4.3. Energy Cost:

- Electricity Consumption -719237 Unit, Total Cost- Rs.-6788972/- Per Year
  - c) Conventional energy-614012Unit
  - d) Nonconventional energy-105225 Unit Less-Rs.1162736.25/ .Rs. for Paid-Rs.-6788972/
- Fossil fuel consumption per Year:
  - d. Number of Gas cylinders used for cooking purpose(Hostels& Canteen) – 324PC
  - e. Number of Gas cylinders used in Chemistry Laboratory - 2PC
  - f. Diesel used for green Generater-1300 liter
- Number of Green Generators - 4
- Cost of generator fuel – Rs.110500 /year

Table 6. Expenditure cost of uses energy

Expenditure cost of uses energy	Cost in Percentage
Conventional Electric Power	91.5
LPG Gas	7
Others	1.5

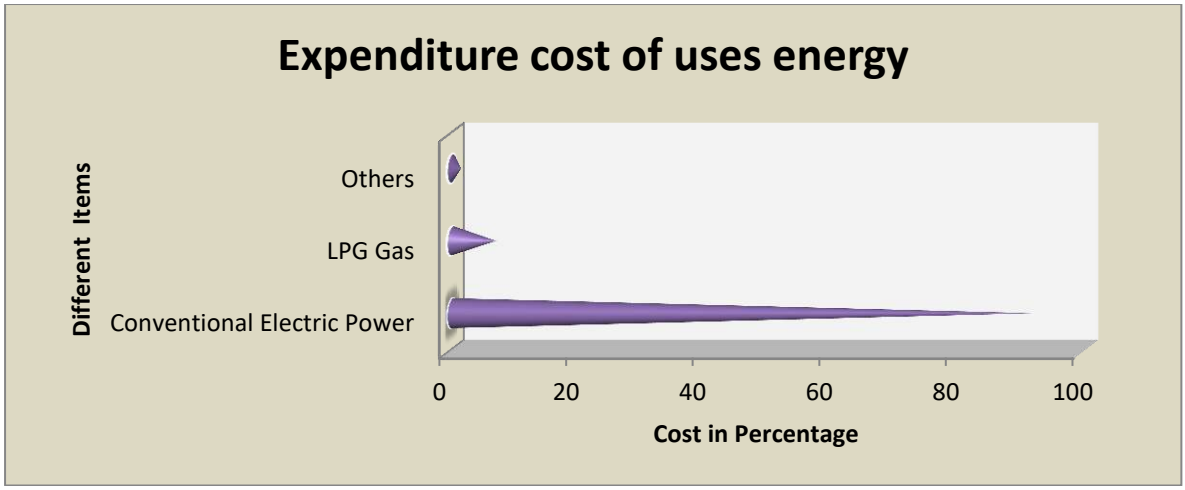


Fig. 4 Use of Energy cost in Percentage

Energy consumption in different purpose , 2021-22		
1	Lights & Fans	374003 unit
2	Air Conditions	58977 unit
3	Lifting of water(HP pump)	79116unit
4	Computer & Dept. Lab	107885 unit
5	Others(CCTV,TV, water cooler & others)	99254unit

Routine of Energy save Practices

- Non Air Condition Day in a week (Wednesday),
- Non Motor vehicles Day- (Thursday),
- World Environment Day – June 5,
- Ozone Day – September 16
- Awareness seminars are organized on various environmental problems.

Major Audit Observations		
Sl. No	**Sectors/Indicators**	weightage
1	Applied of NCE	L
2	Step to LED and CFL Bulb use	M
3	Reduce of AC User	H
4	Awareness	H
5	Management of GHG_S	H

* H denote- Taken management policy level above 60%

** M denote- Taken management policy level 40%-60%

*** L denote-Taken management policy level below 40%

4.4 Energy Conservation Proposals :

Providing Energy Saver Circuit to the Air Conditioners: The energy saver circuits for the air conditioners, intelligently reduces the operating hours of the compressors either by timing or temperature difference logic without affecting the human comfort. This can save around 15% to 30% of the electricity depending on the weather conditions and temperature settings. There are total 7 split type air conditioners. It is Recommended that the old air conditioners are being replaced with new energy efficient BEE STAR labeled (3 Star and above) air conditioners in a phased manner. Considering the average compressor ON Time = 5 h/day

Proposal for Air- Conditioners to Energy Save

- Kwh/day/air conditioner Yearly operating days = 160 days/year/air conditioner
- Yearly electricity consumption = 216000kWh/year/air conditioner
- Considering a saving of 15%,totel annual savings = 15% x 216000
- = 32400kWh/year/air conditioner codt of electricity =Rs. 11.06/kWh
- Yearly savings = Rs. 358344/year/air conditioner

5. Conclusion and Recommendations

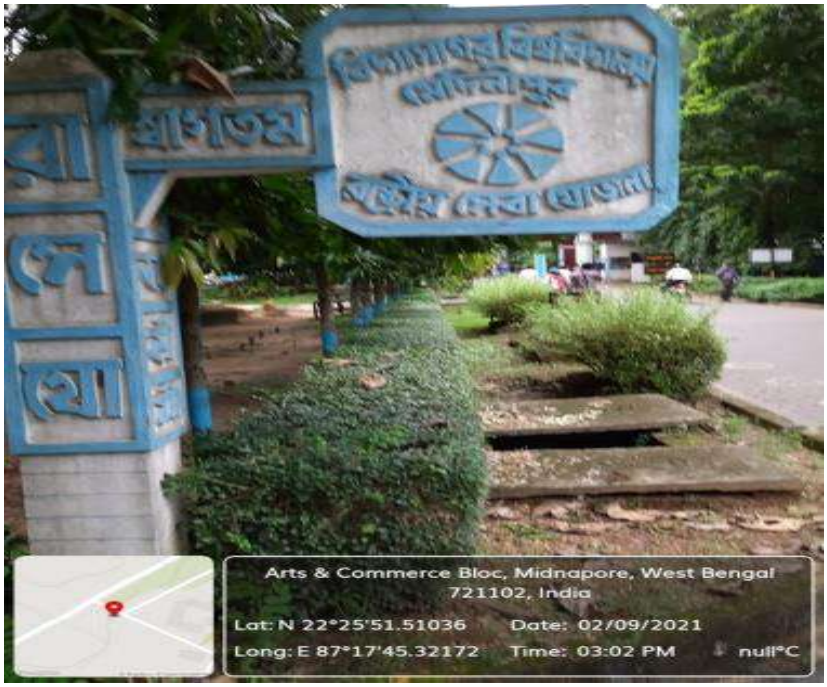
General Recommendations:

- . All computers to have power saving settings to turn off monitors and hard discs, say after10 minutes/30 minutes.
- All Class Rooms and labs to have Display Messages regarding optimum use of electrical appliances in the room like lights, fans, computers and projectors
- Most of the time, all the tube lights in a class room are kept **on,** even though, there is sufficient light level near the window opening.
- In such cases, the light row near the window may be kept **off**.
- All projectors to be kept OFF or in idle mode if there will be no presentation slides.

Criteria Wise Recommendations

Energy

- ✓ Installation of more solar panels and other renewable energy sources.
- ✓ More energy efficient fans, tubes and bulb should be replaced.
- ✓ Conduct more save energy awareness programs for students and staff.
- ✓ Replace old computers and TVs with LED monitors.
- ✓ Observe a power saving day every year.
- ✓ Automatic power switch off systems may be introduced.



Submitted the Report

Acknowledgements:-

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LAKE ATHABASCA CANADA

Latitude 22.421960° Longitude 87.307155°

LOCAL 16:39:54 GMT 11:09:54 THURSDAY 03.24.2022 ALTITUDE -5 METER

University Road,Medinipure, Rangamati, Midnapore, West Bengal 721102, India

Latitude 22.429757°

Longitude 87.298550°

LOCAL 17:27:55 THURSDAY 03.24.2022

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2021

Medicinal Plants of Vidyasagar University Campus

NSS Unit I

Department of Botany and Forestry

Vidyasagar University

Programme Officer: Dr. Debdulal Banerjee

Sl. No.	Scientific name	Family	Habit	Position at campus	Abundance	Medicinal properties	Photograph
1	*Azadirachta indica* ***(Neem)***	Meliaceae	Tree	1st gate of play-ground	More than 10	Used as antifungal, antibacterial diseases.	
2	*Vernonia cinerea* ***(Sadobi)***	Asteraceae	Herb	Near the play-ground	More than 10	Used as anti cancer agent, cough, flatulence and other chronic skin diseases.	

3	*Mimosa pudica* ***(Lojjabati)***	Mimosaceae	Herb	Beside play-ground	More than 20	Used to treat wound, having anti -venom activity, used to treat piles, ulcers.	
4	*Anacardium occidentale* ***(Kaju)***	Anacardiacea e	Tree	Beside the play-ground	More than 40	Used to treat cancerous ulcers, elephantiasis, diarrhea, thrush, fruits are used to treat fever, dysentery, leukoderma.	
5	*Lantana camara* ***(Bhoot bhairavi)***	Verbenaceae	Shrub	Near pavilion	More than 10	Used to treat cancer, skin itches, leprosy, rabies, chicken pox, asthma etc.	

6	*Clerodendrum viscosum* ***(Ghetu)***	Verbenaceae	Shurb	Near the play-ground	More than 30	Used to treat skin disease, bronchitis, fever, wounds, snake bite etc.	
7	*Croton bonplandianum* ***(Churchuri)***	Euphorbiaceae	Herbs	Beside the play-ground	More than 30	Used to treat skin disease, constipation, as purgative.	
8	*Alstonia scholaris* ***(Chattim)***	Apocynaceae	Tree	Beside the play-ground	More than 40	Used to treat skin disorder, fever, bowel complaints, diarrhea, dysentery, catarrhal dyspepsia etc.	
9	*Psidium guajava* ***(peyara)***	Myrtaceae	Tree	On the way of 3rd gate	2	used for inflammation,	

						diabetes, hypertension, caries, wounds, pain relief, fever, diarrhea, rheumatism, lung diseases and ulcers.	
10	*Ziziphus mauritiana* ***(Kul)***	Rhamnaceae	Tree	On the way of 3rd gate	5	Used to treat ulcers, fevers, nausea, vomiting etc.	
11	*Musa paradisiacal* ***(Banana)***	Musaceae	Tree	Way of 3rd gate	3	Prevent asthma, cancer, high blood pressure, diabetes, cardiovascular disease, and digestive problems.	

12	*Phoenix dactylifera* ***(khejur)***	Arecaceae	Small tree	Left side of the road toward 3rd gate	More than 3	Used to treat constipation, cholesterol, diarrhea, colon cancer, improve heart health.	
13	*Calotropis gigantean* ***(Akanda)***	Asclepiadaceae	Shrub	Left side of the road toward 3rd gate	More than 5	Used to treat vomiting, purgation, skin diseases, diarrhea etc.	
14	*Ficus religiosa* ***(Ashwattha)***	Moraceae	Tree	Left side of the road toward 3rd gate	2	Used to treat disorders including asthma, diabetes, diarrhea, epilepsy, gastric problems, inflammatory disorders, infectious and sexual disorders.	

15	*Mangifera indica* ***(Aam)***	Anacardiacea e	Tree	Front of 3rd gate	More than 2	Used to treat cancer, heart diseases, gonorrhea, scabies, diabetes, diphtheria etc.	
16	*Hibiscus rosa-sinensis* ***(Jaba)***	Malvaceae	Shrub	Front of 3rd gate	More than 5	Used to treat urinary disease, leucorrhea, diabetes.	
17	*Syzygium cumini* ***(Jamun / Kaala jam)***	Myrtaceae	Tree	Front of 3rd gate	2	Used to treat skin diseases, vomiting, malaria, heart disease etc.	
18	*Crotalaria pallida* ***(Rattlepods)***	Fabaceae	Under shrub	Beside play-ground	More than 10	Used to treat scabies, diarrhea, skin diseases, flatulence, leprosy, fever etc.	

19	*Melia azadirachta*	Meliaceae	Tree	Near Eng. Section of University	2	Used in vomiting,burning sensation,opthalmia,jaundice,skin disease etc.	
20	*Vernonia cinerea*	Asteraceae	Herb	Near Uco bank	More than 20	Used as stomachic,astringent,to cure consumption,asthma etc.	

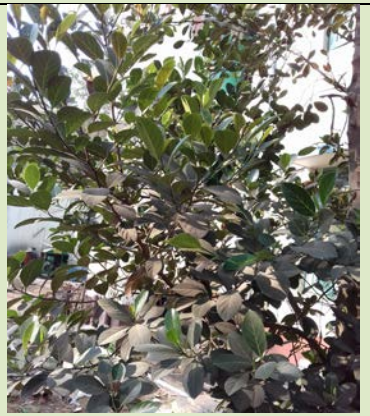
21	*Mimosa pudica*	Mimosaceae	Herb	Near Eng.Section	Numerous	Used to treat swelling of cattle,leprosy,dysentery etc.	
22	*Coccinia grandis*	Cucurbitaceae	Climber	Back side Administrative Building	More than 10Fruits	Fruits have been used to treat leprosy ,fever,asthma,beronchitis and jaundice.	

23	*Lantana camara*	Verbenaceae	Shrub	Near the distance building	More than 5	Used as antiseptic,carminative,laxative,antidote to snake venom.	
24	*Cynodon dactylon*	Poaceae	Grass	Back side of Administrative Building	Numerous in number	This plants is used as antiviral and antimicrobial .It is beneficial to wonds piles eczema etc.	

25	*Aegle marmelos*	Rutaceae	Tree	Near Eng. Section of University	One	Fruits are used in the treatment of chronic diarrhea ,dysentery ,and peptic ulcers ,as a laxative.	
26	*Musa balbisiana*	Musaceae	Large herbaceous	Near Eng. Section of University.	One	Used to fight intestinal disorder like ulcers and also used for the treatment of the Burn and wounds.	

27	*Oxalis corniculata*	Oxalidaceae	Herb	Near Uco bank	More than 10	Used to remove warts and opacities of cornea etc.	
28	*Blumea lacera*	Asteraceae	Herb	Back side of Administrative Building	More than 10	Used in bronchitis,cholera,disease of the mouth etc.	
29	*Syzygium cumini*	Myrtaceae	Tree	Near Eng. Section of University.	One	Control diabetes and used for medicine for digestive aliments.	

30	*Synedrella nodiflora*	Asteraceae	Herb	Near Uco bank	More than 5	Boiled leaves used as laxative,to treat rheumatism.	
31	*Oldenlandia corymbosa*	Rubiaceae	Herb	Near Eng. Section of University.	Numerous in number.	Used as anthelmintic,to treat fever,jaundice etc.	

32	*Artocarpous heterophyllus*	Moraceae	Tree	Backside of Eng. Section of University	One	Used this fruit for its antibacterial ,anti inflammatory,anti-diabetes,to increase immunity.	
33	*Psidium guajava*	Myrtaceae	Tree	Near Eng. Section of University.	One	Benificial for constipation piles and haemorrhoids. Guava seeds are laxatives ,help in chronic constipation and cleaning the digestive system.	

34	*Ficus glomerata*	Moraceae	Tree	Near Eng. Section of University	Two	Used in bronchitis,bleeding piles etc.	
35	*Phyllanthus emblica*	Euphorbiaceae	Tree	Near Eng. Section of University.	One	Excellent source of vitamine C. Prevent baldness due to the presence of carotene and iron .	

36	*Corchorus olitorius*	Tiliceae	herb	Near Eng. Section of University.	More than 10	Leaves is reported to be demulcent ,deobstruent,diuretic,lactagogue,purgative,and tonic.Aurvedics use the leaves for ascites ,pain,piles ,and tumors.	
37	*Scoparia dalcis*	Scrophulariaceae	Herb	Near Eng. Section of University.	More than 5	Used to treat cough,burning sensation,to treat stone of bladder,mouth ulcer etc.	

38	*Ficus religiosa*	Moraceae	Tree	Near Eng. Section of University.	One	Used traditionallybas antiulcer,antibacterial,antidiabetic, in the treatment of gonorrhea and skin disease.	
39	*Zizyphus mauritiana*	Rhamnaceae	Tree	Near Uco Bank	One	The fruits are applied on cuts and uicers;are employed in pulmonary ailments and fevers.The seeds are taken to halt nausea,vomitinga nd abdominal pains in pregnancy.	

40	*Tagetes patula*	Asterace	Herb	In front of Administrative building		It is used internally in the treatment of indigestion, colic, severe constipation, coughs and dysentery.	
41	*Euphorbia hirta*	Euphorbiaceae	Herb	Near Uco Ban	More than 10	Used in dysentery,diarrhoea,eye trouble etc.	

42	*Mimusops elengi*	Sapotaceae	Tree	Near Eng. Section of University.	One	This tree is specially useful in treating gum problems and dental disorders such as bleeding gums,loose teeth ,sensitive teeth cavities etc.	
43	*Terminalia arjuna*	Combretaceae	Tree	Near Administrative Building	One	Used to treat wound, heart disease, ulcers, hemorrhage etc.	

44	*Santalum album*	Santalaceae	Tree	In front of Administrative building	One	Sandalwood oil widely used for treatment of common colds, bronchitis, skin disorders, heart ailments, general weakness, fever, infection of the urinary tract, inflammation of the mouth and pharynx.	
45	*Polyalthia longifolia*	Annonaceae	Tree	In front of Administrative building	More than 10	Used to treat fever, skin disease, diabetes, hypertension, helminthiasis.	

46	*Murraya paniculata*	Rutaceae	Shrub	In front of Administrative building	More than 50	Used to treat dental abscesses, diabetes, acid reflux.	
47	*Boerhaavia diffusa*	Nyctaginiaceae	Herb	In front of UCO Bank	More than 5	Used to treat cancer, inflammation, chest congestion, heart disease.	

48	*Calotropis gigantea*	Asclepiadaceae	Shrub	Right side of the road of 3rd gate	More than 10	Used in dysentery,elephantiasis,to cure septic wound of cattle,etc.	
49	*Aerva javanica*	Amaranthaceae	Herb	Near distance building	More than 10	Used to stop bleeding in fresh cut	
50	*Pluchea indica*	Asteraceae		Near play ground	Less than 10	Leaf extract used in wound healing	

51	*Blumea lacera*	Asteraceae		Near play ground	More than 10	Leaves are used in treatment of headache, fever, ulcer.	
52	*Azadirachta indica*	Meliaceae		Near the road to boys hostel	Less than 5	All parts are used in treatment of skin disease, liver disease, dental problems, asthma & ulcer.	

53	*Ziziphus jujuba*	Rhamnaceae		Near the road to boys hostel	More than 10	Fruit used as anti-anxiety, anti-stress medicinal food.	
54	*Aegle marmelos*	Rutaceae		Near animal faculty	Less than 5	Fruits are used in diarrhea & dysentery.	

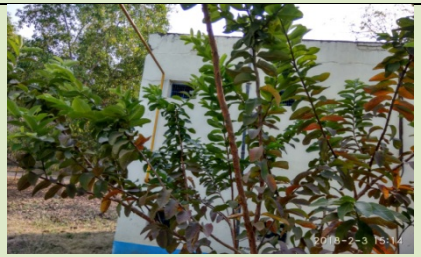
55	*Cassia occidentalis*	Fabaceae		Near water tank	Less than 5	Leaves are used in the treatment of cough, cold, dyspepsia.	
56	*Terminalia bellirica*	Combretaceae		Near water tank	Less than 5	Used to protect liver & to treat respiratory diseases.	

57	*Anisomales indica*	Lamiaceae		Near boys hostel	More than 10	Used in treatment of gastrointestinal disorders.	
58	*Spermacoce hispida*	Rubiaceae		Near boys hostel	More than 10	Used in treatment of ear discharge.	
59	*Alstonia scholaris*	Apocynaceae		Near boys hostel	More than 10	Bark used in treatment of malaria, ulcers, ashthma, indigestion.	

60	*Solanum sisymbriifolium*	Solanaceae		Near boys hostel	Less than 5	Diuretic & antihypertensive.	
61	*Hyptis suaveolens*	Lamiaceae		Near the road to boys hostel	More than 10	Used to treat fever.	

62	*Terminalia arjuna*	Combretaceae		Near play ground	Less than 5	Used in treatment of cardiovascular diseases & high cholesterol.	
63	*Achyranthes aspera*	Amaranthaceae		Near play ground	More than 10	Used to treat cough, ashthma, anemia, jaundice.	

64	*Scoparia dulcis*	Scrophulariaceae		Near play ground	Less than 5	Used to treat indigestion.	
65	*Tagetus petula (Merigold)* *Family-Asteraceae*		Herbs	Infront of B.C Mukharjee hall	More than 10	Treat in swollen bug bites,burns etc.	
66	*Azadirecta indica(Neem)* *Family-Meliaceae*		Tree	Beside aquaculture depertment	2	Used as antibacterial agent in cosmetic industry.	

67	*Psidium guajava* *Family-Myrtaceae*		Tree	Beside aquaculture depertment	2	Used in diabetes,also have heeling properties.	
68	*Ixora coccinea* *Family-Rubiaceae*		Shrubs	Beside aquaculture depertment	3	Have antibacterial activity and Antidiarrheal.	
69	*Tabernaemontana divaricta* *Family-Apocynaceae*		Shrubs	Beside aquaculture depertment	3	Used as antiseptic and remedy of eye disease.	

70	*Nerium indicum* *Family-Apocynaceae*		Shrubs	Beside aquaculture depertment	3	Used in burning sensation.	
71	*Adhatoda vasica* *Family-Acanthaceae*		Shrubs	Beside chemistry depertment	2	Used in cough,diabetes etc.	
72	*Andrographis paniculata* *Family-Acanthaceae*		Herbs	Beside chemistry depertment	More than 10	Used as a remedy of gastric problems.	
73	*Emblica officinalis* *Family-Phyllanthaceae*		Tree	Beside chemistry depertment	2	Used to cure cardiovascular problems.also an antioxident.	

74	*Asparagus adscendens* *Family-Asparagaceae*		Herb	Beside chemistry depertment	2	Used to treat urinary problems	
75	*Ocimum gratissimum* *Family- Lamiaceae*		Herb	Beside chemistry depertment	2	Usedto cure cough,skin disease,chest pain	
76	*Costus igneus(Insulin plant)* *Family-Costaceae*		Herb	Beside chemistry depertment	1	Used to cure leprosy,worm infection,fever,bronchitis.	

77	*Aloevera barbadensis* *Family-Asphodelaceae*		Herb	Beside chemistry depertment	More than 10	Used to cure skin disease,digestive problems.	
78	*Eupatorium triplinerve* *Family- Euphorbiaceae*		Herb	Beside chemistry depertment	1	Used in liver ,ulsar problem.	
79	*Gymnema sylvestre(Gurmar)* *Family-Apocynaceae*		Herb	Beside chemistry depertment	1	Used to treat diabetes,allergic reaction.	
80	*Arica catechu* *Family- Palmae*		Tree	Beside chemistry depertment	More than 10	Used as diuretic,digestive ,anthelmentic.	

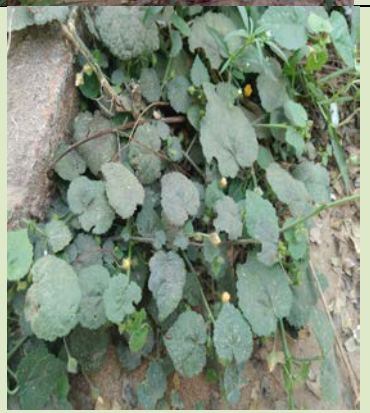
81	*Barleria prionities* *Famliy-Acanthaceae*		Shrubs	Infront microbiology dept.	More than 10	Used to cure fever,toothachae etc.	
82	*Cajanus cajan* *Family-Fabaceae*		Tree	Inront of Botany dept.	5	Used ti cure food poisoning,constipation etc.	
83	*Oxalis corniculata* *Family-Oxalidaceae*		Herb	Infront microbiology dept	More than 10	Used to cure Stomach and liver problems.	

84	*Polyalthia longifolia* *Family-Annonaceae*		Tree	Infront of Library	More than 10	Have an antimicrobial and antiulcer activity.	
85	*Acacia auriculiformis.* *Family-leguminoceae*		Tree	Infront of Library	More than 10	Used to cure wound healing.	
86	*Alstonia scholaris* *Family-Apocynaceae*		Tree	Inront of Botany dept.	2	Used as antibacterial agent,also in asthma.	

87	*Hibiscus rosasinensis* *Family-Malvaceae*		Shrubs	On the way of canteen	5	Used in Diarrhoae,hair problem.	
88	*Clitoria ternatea* *Family-Fabaceae*		Herb	Inront of Botany dept.	2	Used to cure nerve,brain and cardiac problems.	
89	*Caryota mitis(fish tail palm)* *Family-Palmae*		Tree	Inront of microbiology dept.	2	Have antioxident,and antidiabetic properties.	

90	*Melia azadirechta*	Meliaceae	Tree	Back side of canteen	More than 2	Used in vomiting,burning sensation,opthalmia,jaundice,skin disease etc.	
91	*Vernonia cinerea*	Asteraceae	Herb	Back side of canteen	More than 20	Used as stomachic,astringent,to cure consumption,asthma etc.	
92	*Mimosa pudica*	Mimosaceae	Herb	Near the boy's hostel	More than 10	Used to treat swelling of cattle,leprosy,dysentery etc.	

93	*Eupatorium odoratum*	Asteraceae	Under shrub	Near the boy's hostel	More than 10	Used in haematemesis,jaundice,dysentery etc.	
94	*Lantana camara*	Verbenaceae	Shrub	Road side of boy's hostel	More than 10	Used as antiseptic,carminative,laxative,antidote to snake venom.	
95	*Clerodendrum viscosum*	Verbenaceae	Shurb	Road side of boy's hostel	More than 10	Used as tonic,aphrodisiac,provider's,skin disease etc.	

96	*Mikenia scandens*	Asteraceae	Herb,climber	Back side of canteen	More than 2		
97	*Croton bonplandianum*	Euphorbiaceae	Tree	Back side of canteen	More than 3	Use to hypotensive and spasmolytic	
98	*Sida humilis*	Malvaceae	Herb	Right side of the auditorium road	5	Used to	

99	*Blumea lacera*	Asteraceae	Herb	Back side of canteen	Huge amount of plant	Used in bronchitis,cholera,disease of the mouth etc.	
100	*Sida cordifolia*	Malvaceae	Shurb	Back side of canteen	More than 5	Uesed to diuretic , astringent, bleeding tiles.	

101	*Synedrella nodiflora*	Asteraceae	Herb	Back side of canteen	More than 10	Boiled leaves used as laxative,to treat rheumatism.	
102	*Oldenlandia corymbosa*	Rubiaceae	Herb	Back side of canteen	More than 10	Used as anthelmintic,to treat fever,jaundice etc.	
103	*Cleome viscosum*	Crassulaceae	Shrub	Back side of canteen	More then 3	Used to Anti-dirrheal .	

104	*Hibiscus vitifollia*	Malvaceae	Herb	Back side of canteen	1	Used to Herbal drugs.	
105	*Ficus benghalensis*	Moraceae	Tree	Road side of boy's hostel	2	Used in bronchitis,bleeding piles etc.	

106	*Mitracurpus sp*	Rubiaceae	Herb	Road side of boy's hostel	Huge amount of plant	Used to Anti-microbial & Anti-oxident	
107	*Rungia pectinata*	Acanthaceae	Herb	Road side of boy's hostel	More than 10	Used to diuretic and antimicrobial activities	
108	*Scoparia dalcis*	Scrophulariaceae	Herb	Back side of canteen	More than 10	Used to treat cough,burning sensation,to treat stone of bladder,mouth ulcer etc.	

109	*Physalis minima*	Solanaceae	Shrub	Front of Boy's hostel	1	Used as treat of painful micturition.	
110	*Urena sinuata*	Malvaceae	Shurb	Road side of boy's hostel	More than 5	Used as emollient,and refrigerant etc.	
111	*Tridax procumbens*	Asteraceae	Herb	Back side of canteen	Huge amount of plant	Used in dysentery,diarrhoea,haemorrhage of cuts etc.	

112	*Euphorbia hirta*	Euphorbiaceae	Herb	Back side of canteen	More than 5	Used in dysentery,diarrhoea,eye trouble etc.	
113	*Hyptis suaveolens*	Lamiaceae	Shrub	Near the boy's hostel	More than 10	Used as armistice,stomachic,antireuhmatic etc.	
114	*Solanum sisymbrifolium*	Solanaceae	Shrub	Back side of canteen	More than 10	Used in dropsy,to treat cough and bronchitis etc.	

115	*Solanum nigram*	Solanaceae	Shrub	Back side of canteen	More than 5	Used to hepatoprotective , diuretic	
116	*Ficus benghalensis*	Moraceae	Tree	Road side of boy's hostel	1	Used to Gastric problem and inflammatiom and cancer	

117	*Sida acuta*	Malvaceae	Under shrub	Road side of boy's hostel	More than 10	Used as anti-pyretic,used in nervous and urinary disorder etc.	
118	*Melia azadirachta*	Meliaceae	Tree	Near the distance building	More than 10	Used in vomiting, burning sensation, jaundice, skin disease etc.	

119	*Vernonia cinerea*	Asteraceae	Herb	Near the distance building	More than 10	Used as stomachic, astringent, to cure consumption, asthma etc.	
120	*Mimosa pudica*	Mimosaceae	Herb	Near the distance building	More than 10	Used to treat swelling of cattle, leprosy, dysentery etc.	

121	*Eupatorium odoratum*	Asteraceae	Under shrub	Near the distance building	More than 10	Used in haematemesis, jaundice, dysentery etc.	
122	*Lantana camara*	Verbenaceae	Shrub	Near the distance building	More than 10	Used as antiseptic, carminative, laxative, antidote to snake venom.	

123	*Clerodendrum viscosum*	Verbenaceae	Shurb	Near the distance building	More than 10	Used as tonic, aphrodisiac, provider's, skin disease etc.	
124	*Mikania scandens*	Asteraceae	Herb, climber	Right side of the auditorium road	2	Used as hypoglycemic, antimicrobial, anti cancer etc.	
125	*Zanthoxylem budranga*	Rutaceae	Tree	Right side of the auditorium road	1	Ayurved, used in treatment of digestive system etc.	

126	*Oxalis corniculata*	Oxalidaceae	Herb	Right side of the auditorium road	5	Used to remove warts and opacities of cornea etc.	
127	*Blumea lacera*	Asteraceae	Herb	Right side of the auditorium road	More than 10	Used in bronchitis, cholera, disease of the mouth etc.	
128	*Achyranthes aspera*	Amaranthaceae	Herb	Right side of the auditorium road	More than 10	Used in dyspepsia, dysentery, gonorrhea, pneumonia etc.	

129	*Synedrella nodiflora*	Asteraceae	Herb	Right side of the auditorium road	More than 10	Boiled leaves used as laxative, to treat rheumatism.	
130	*Oldenlandia corymbosa*	Rubiaceae	Herb	Right side of the auditorium road	More than 10	Used as anthelmintic, to treat fever, jaundice etc.	

131	*Bryophyllum pinnatum*	Crassulaceae	Shrub	Right side of the auditorium road	5	Used in treat diabetes, haematemesis, treat tumors etc.	
132	*Clitoria ternatea*	Fabaceae	Herb	Right side of the auditorium road	5	Used in ayurved, good for improving voice quality and problems of throat etc.	

133	*Ficus glomerata*	Moraceae	Tree	Right side of the auditorium road	1	Used in bronchitis, bleeding piles etc.	
134	*Grewoa asiatica*	Tiliaceae	Small tree	Right side of the road toward 3rd gate	More than 10	Used to treat cough,heart disease etc.	
135	*Crinum asiaticum*	Amaryllidaceae	Shrub	Front of auditorium	More than 10	Used as diaphoretic, emetic, laxative, etc.	

136	*Scoparia dalcis*	Scrophulariaceae	Herb	Front of auditorium	More than 10	Used to treat cough, burning sensation, to treat stone of bladder, mouth ulcer etc.	
137	*Crotalaria pallida*	Fabaceae	Shrub	Front of auditorium	More than 10	Used as hypotensive and anti-tumor etc.	

138	*Urena sinuata*	Malvaceae	Shurb	Front of auditorium	More than 10	Used as emollient, and refrigerant etc.	
139	*zizyphus nummularis*	Rhamnaceae	Tree	Side of auditorium	2	Used in bleeding gums, boils, joint pains etc.	
140	*Tridax procumbens*	Asteraceae	Herb	Side of auditorium	More than 10	Used in dysentery, diarrhoea, haemorrhage of cuts etc.	

141	*Euphorbia hirta*	Euphorbiaceae	Herb	Side of auditorium	More than 10	Used in dysentery, diarrhoea, eye trouble etc.	
142	*Hyptis suaveolens*	Lamiaceae	Shrub	Side of auditorium	More than 10	Used as armistice, stomachic, antireuhmatic etc.	

143	*Solanum sisymbrifolium*	Solanaceae	Shrub	Side of auditorium	More than 10	Used in dropsy, to treat cough and bronchitis etc.	
144	*Trema orientalis*	Cannabaceae	Shrub	Side of auditorium	More than 10	Used to treat coughs, sore throats, asthma etc.	

145	*Anacardium occidentale*	Anacardiacea e	Tree	Behind the auditorium	More than 10	Treating snake bites, apply nut oil to crack heels etc.	
146	*Ficus benghalensis*	Moraceae	Tree	Behind the auditorium	1	Used to treat chronic diarrhoea, and dysentery etc.	
147	*Hemidesmus indicus*	Asclepiadace ae	Herb,cli mber	Right side of the road of 3rd gate	3	Valuable remedy for constitutional debality, appetite, diarrhoea etc.	

148	*Calotropis gigantea*	Asclepiadaceae	Shrub	Right side of the road of 3rd gate	More than 10	Used in dysentery, elephantiasis, to cure septic wound of cattle, etc.	
149	*Sida acuta*	Malvaceae	Under shrub	Right side of the road of 3rd gate	More than 10	Used as anti-pyretic, used in nervous and urinary disorder etc.	
150	*Aschynomene aspera*	Fabaceae	Shrub	Right side of the road of 3rd gate	7	Used in ayur vedic ,have antimicrobial activity etc.	

151	*Aerva javanica*	Amaranthaceae	Herb	Near distance building	More than 10	Used to stop bleeding in fresh cut	
152	*Aerva lanata*	Amaranthaceae	Herb	Right side of the road of 3rd gate	More than 10	Used in headache, urinal complaints, ulcer, diabetes etc.	
153	*Ichnocarpus frutescens*	Apocynaceae	Herb,climber	Near distance building	2	Used to cure cough, vomiting, fever, to treat scabies etc.	

154	*Triumfetta rhomboidea*	Malvaceae	Under shrub	Right side of the road of 3rd gate	Right side of the road of 3rd gate	Used as diuretic, used in diarrhoea, dysentery, gonorrhea etc.	
155	*Zizyphus oenophilla*	Rhamnaceae	Tree	Right side of the road of 3rd gate	More than 10	Used for ascaris infection, hyper acidity etc.	

156	*Synedrella asiatica*	Asteraceae	Herb	More than 10	Front of Canteen		
157	*Vernonia cinerea*	Asteraceae	Herb	More than 10	Front of Canteen		
158	*Anacardium occidentale*	Anacardiaceae	Tree	3	Front of Canteen		

159	*Mikania cordata*	Asteraceae	Climber	More than 10	Front of Canteen		
160	*Foeniculum vulgare*	Apiaceae	Herb	More than 10	Front of Canteen		
161	*Enhydra fluctuans*	Asteraceae	Herb	1	Front of Canteen		

162	*Azadiracta indica*	Meliaceae	Tree	3	Front of Canteen		
163	*Carica papaya*	Caricaceae	Giant herb	2	Front of Canteen		

164	*Ananas comosus*	Bromeliaceae	Herb	More than 10	Front of Canteen		
165	*Musa parasidica*	Musaceaa	Shrub	4	Front of Canteen		
166	*Mangifera indica*	Anacardiacea e	Tree	5	Front of Canteen		

167	*Ecbolium sp.*	Acanthaceae	Herb	More than 10	Front of Canteen		
168	*Solanum nigrum*	Solanaceae	Herb	more than 10	Front of Canteen		
169	*Polyalthia longifolia*	Annonaceae	Tree	More than 10	Side of Xerox centre		

170	*Citrus sp.*	Rutaceae	Shrub	1	Near Canteen		
171	*Acalypha indica*	Euphorbiaceae	Herb	More than 10	Near Canteen		
172	*Oldenlandia corrymbosa*	Rubiaceae	Herb	More than 10	Near Canteen		

173	*Coccinia grandis*	Cucurbitacea e	Climber	More than 10	Near Canteen		
174	*Justicia simplex*	Acanthaceae	Shrub	more than 10	Near medical unit		
175	*Oxalis acetosella*	Oxalidaceae	Herb	More than 10	Near medical unit		

176	*Ixora coccinia*	Rubiaceae	Shrub	More than 10	Near medical unit		
177	*Psidium guajava*	Myrtaceae	Tree	3	Near medical unit		
178	*Tecoma sp.*	Bignoniaceae	Tree	More than 10	Near medical unit		

179	*Nyctanthus sp.*	Oleaceae	Shrub	3	Front of Xerox centre		
180	*Urena sinuata*	Malvaceae	Herb	More than 10	Front of Xerox centre		
181	*Tagetes patula*	Asteraceae	Herb	More than 10	Near 1st gate		

182	*Mirabilis jalapa*	Apocynaceae	Herb	More than 10	Near 1st gate		
183	*Rhoeo discolor*	Commelinaceae	Herb	More than 10	Near engineering building		
184	*Artocarpus heterophyllus*	Moraceae	Tree	5	Near engineering building		

185	*Aegle marmelos*	Rutaceae	Tree	1	Back side of Ad building		
186	*Blumea lacera*	Asteraceae	Herb	More than 10	Back side of Ad building		
187	*Melia azadirechta*	Meliaceae	Tree	Near the distance building	More than 10	Used in vomiting,burning sensation,opthalmia,jaundice,skin disease etc.	

188	*Vernonia cinerea*	Asteraceae	Herb	Near the distance building	More than 10	Used as stomachic,astringent,to cure consumption,asthma etc.	
189	*Mimosa pudica*	Mimosaceae	Herb	Near the second gate	More than 10	Used to treat swelling of cattle,leprosy,dysentery etc.	

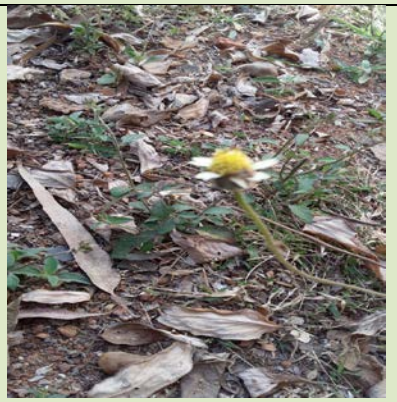
190	*Eupatorium odoratum*	Asteraceae	Under shrub	Near the second gate	More than 10	Used in haematemesis,jaundice,dysentery etc.	
191	*Lantana camara*	Verbenaceae	Shrub	Near the distance building	More than 10	Used as antiseptic,carminative,laxative,antidote to snake venom.	
192	*Clerodendrum viscosum*	Verbenaceae	Shurb	Near the second gate	More than 10	Used as tonic,aphrodisiac,provider's,skin disease etc.	

193	*Mikenia scandens*	Asteraceae	Herb,climber	Near the second gate	More than 10		
194	*Sida cordifolia*	Malvaceae	Under shrub	Right side of the second gate	More than 10		
195	*Oxalis corniculata*	Oxalidaceae	Herb	Near the distance building	5	Used to remove warts and opacities of cornea etc.	

196	*Blumea lacera*	Asteraceae	Herb	Near the distance building	More than 10	Used in bronchitis,cholera,disease of the mouth etc.	
197	*Achyranthes aspera*	Amaranthaceae	Herb	Near the distance building	More than 10	Used in dyspepsia,dysentery,gonorrhoe,pneumonia etc.	
198	*Synedrella nodiflora*	Asteraceae	Herb	Near the distance building	More than 10	Boiled leaves used as laxative,to treat rheumatism.	

199	*Oldenlandia corymbosa*	Rubiaceae	Herb	Near the distance building	More than 10	Used as anthelmintic,to treat fever,jaundice etc.	
200	*Ixora coccinea*	Rubiaceae	Shrub	Near the distance building	More than 10	Used in treat diabetes,haematemesis,treat tumors etc.	
201	*Hibiscus rosa sinensis*	Malvaceae	Shrub	Back side of distance building	2	Uses in various forms to treat cough ,hair loss etc.	

202	*Phyllanthus fraternus*	Euphorbiaceae	Herb	Near the distance building	More than 10	Used in kidney stones, and viral infections etc.	
203	*Tecoma stans*	Bignoniaceae	Shrub	Front of distance building	More than 10	Used as tonic ,anti syphilitic etc.	
204	*Acalypha indica*	Euphorbiaceae	Herb	Front of distance building	More than 10	Used as treating pneumonia ,anti periodic etc.	

205	*Urena sinuata*	Malvaceae	Shurb	Near the distance building building	More than 10	Used as emollient,and refrigerant etc.	
206	*zizyphus nummularis*	Rhamnaceae	Tree	Near the second gate	2	Used in bleeding gums,boils,joint pains etc.	
207	*Tridax procumbens*	Asteraceae	Herb	Near the distance building	More than 10	Used in dysentery,diarrhoea,haemorrhage of cuts etc.	

208	*Anacardium occidentale*	Anacardiacea e	Tree	Near the second gate	More than 10	Uses in Hypotension, Pregnancy, Stimulant,etc	

Survey done at Vidyasagar University Campus during summer

University campus immege

Best practices 2

Title of the practices: **Weather monitoring and broadcasting**

Duration (year of inception-year of discontinuation): 2000

- **Objectives of the Practice.**
  1. To monitor different environmental parameters of University campus
  2. To analyze the weather data
  3. To provide important weather information to local people through media
  4. To prepare a repository of weather data

- **The Context.**

  Due to rapidly changing climate, the weather forecast is uncertain and inaccurate. As a result, the weather reporting system is primarily utilized to monitor the constantly changing climatic and weather condition of small areas. And accurate weather report directly and indirectly influence different sector of economy to raise the need for a system that facilitates hear accuracy of real time monitoring and future weather prediction. Economy of Paschim Medinipur is highly depended on agricultural productivity. Agriculture is highly depended on different environment parameters so weather monitoring and regular broadcasting will help the farmers. In managing agricultural practices.

- **The Practice.**

  University have its own metrological park with different weather monitoring instruments, like rainfall, humidity, wind speed and direction, temperature monitoring systems and automated weather station is installed about five years back which uploads weather data directly in the University website. The data is stored in 15 minutes interval throughout the day for futures use. Different

environmental parameters including air quality is monitors and displayed in a large display board in University gate with this instrument not only the temperature but also noise, NOX, suspended particles also detected. Lightening detection system is installed in the campus for early detection of lightening.

- **Evidence of Success:**

  Local newspaper uses our weather data for weather forecasting and reporting. Peoples of the locality regularly visit weather page of University website. People travel through the University Gate regularly to see the display parameters in the board. Researchers of the locality uses our repository for weather data. Students of school and colleges visit Weather Park as part of their academic programme.

- **Problems Encountered and Resources.**

  Sometimes automated weather station stops sending weather data needs human intervention.

Weather monitoring and broadcasting related supporting document


Vidyasagar University
Meteorological Park
27.06.2023 09:20
22.4297, 87.30278


Vidyasagar University
Meteorological Park
27.06.2023 09:19
22.42971, 87.30278
C8JJ+FFH, Kabar Danga Rd, Tantigeria, Midnapore, West Bengal


Vidyasagar University
14.06.2023 14:33
22.43075, 87.29632
C7JW+97J, Midnapore, West Bengal 721102


INAUGURATION
OF
LIGHTNING DETECTION SYSTEMS
(LDS)
BY
PROFESSOR SIBAJI PRATIM BASU
HON'BLE VICE-CHANCELLOR
VIDYASAGAR UNIVERSITY
A Project of RRSC, NRSC, ISRO, Dept. of Space, Go
&
Vidyasagar University
15th MARCH, 2022
Schematic Diagram of LDS Node
Lightning Detection Systems (LDS)


VIDYASAGAR
UNIVERSITY
Vidyasagar University
14.06.2023 14:31
22.48134, 87.29546
C7JW+5G, Vidyasagar University Rd, Phulpahari, West Bengal
721102

Live Weather report

(Midnapore, WB, India, 721102)

Centre for Environment Studies (CES), Vidyasagar University

Current Temparature (Last Updated : 13-05-2023 04:30 PM)	**31.5 °C**
Statistics (00:00 AM to 04:30 PM)	
Total Rainfall	0 mm
Maximum Temperature	42.9 °C (01:15 PM)
Minimum Temperature	26.46 °C (01:30 AM)
Average Temperature	33.02 °C
Maximum RH	87.5 %
Minimum RH	37.81 %
Average RH	58.24 %

From Date

2021-07-01

To Date

2021-09-16

Submit

Date	Total Rainfall	Max Temp.	Min Temp.	Avg. Temp.	Max RH	Min RH	Avg. RH
16/09/2021	0 mm	32.78 °C	24.79 °C	27.58 °C	100 %	73.1 %	94.14 %
15/09/2021	243.58 mm	26.28 °C	24.09 °C	24.99 °C	100 %	100 %	100 %
14/09/2021	76.2 mm	26.44 °C	24.7 °C	25.44 °C	100 %	98.1 %	99.85 %
13/09/2021	36.58 mm	29.24 °C	24.57 °C	27.16 °C	100 %	87.6 %	94.77 %
12/09/2021	16.51 mm	32.34 °C	25.41 °C	28.39 °C	100 %	74.86 %	91.04 %
11/09/2021	12.19 mm	32.66 °C	25.47 °C	27.19 °C	100 %	72.92 %	95.28 %
10/09/2021	20.83 mm	34.7 °C	25.2 °C	28.45 °C	100 %	60.51 %	89.45 %
09/09/2021	14.73 mm	30.26 °C	25.56 °C	27.61 °C	100 %	83.7 %	95.10 %
08/09/2021	0 mm	30.33 °C	25.69 °C	27.33 °C	100 %	81.2 %	94.45 %
07/09/2021	12.45 mm	27.43 °C	25.26 °C	26.15 °C	100 %	94.6 %	99.43 %
06/09/2021	32.77 mm	32.02 °C	26.12 °C	27.80 °C	100 %	78.74 %	95.69 %
05/09/2021	16.26 mm	34.72 °C	26.07 °C	30.05 °C	100 %	64.88 %	85.53 %
04/09/2021	11.68 mm	34.97 °C	26.21 °C	30.63 °C	100 %	62.56 %	83.63 %
03/09/2021	11.68 mm	34.97 °C	26.15 °C	29.99 °C	100 %	54.75 %	84.99 %

02/09/2021	0 mm	34.29 °C	26.2 °C	30.33 °C	99.6 %	63.83 %	83.08 %
01/09/2021	0 mm	34.35 °C	25.71 °C	29.03 °C	100 %	62.45 %	88.65 %
31/08/2021	0.51 mm	33.52 °C	25.98 °C	28.71 °C	100 %	68.43 %	90.51 %
30/08/2021	17.78 mm	33.49 °C	25.24 °C	27.49 °C	100 %	66.53 %	94.62 %
29/08/2021	3.3 mm	32.78 °C	26.03 °C	28.43 °C	100 %	70.55 %	91.79 %
28/08/2021	5.59 mm	33.88 °C	26.06 °C	28.57 °C	100 %	67 %	92.37 %
27/08/2021	0.25 mm	30.73 °C	25.34 °C	28.39 °C	100 %	81.6 %	93.61 %
26/08/2021	8.89 mm	31.76 °C	25.04 °C	27.77 °C	100 %	82 %	95.58 %
25/08/2021	49.78 mm	35.41 °C	25.02 °C	28.57 °C	100 %	67.67 %	92.32 %
24/08/2021	14.99 mm	34.95 °C	25.29 °C	28.79 °C	99.7 %	68.96 %	90.00 %
23/08/2021	0 mm	35.64 °C	25.87 °C	29.80 °C	98.2 %	60.89 %	85.45 %
22/08/2021	0 mm	35.16 °C	26.34 °C	29.96 °C	98.9 %	59.92 %	85.68 %
21/08/2021	6.35 mm	30.94 °C	25.46 °C	27.69 °C	100 %	82.3 %	94.87 %
20/08/2021	2.54 mm	29 °C	25.13 °C	27.20 °C	100 %	88.2 %	95.92 %
19/08/2021	0 mm	32.1 °C	26.32 °C	28.04 °C	99.3 %	77.85 %	93.21 %
18/08/2021	0.76 mm	30.65 °C	26.5 °C	27.87 °C	100 %	83.7 %	95.24 %
17/08/2021	6.6 mm	32.25 °C	26.42 °C	28.38 °C	99.7 %	74.17 %	93.31 %
16/08/2021	0 mm	34.12 °C	26.53 °C	29.32 °C	100 %	66.61 %	90.31 %
15/08/2021	5.08 mm	35.06 °C	26.99 °C	29.43 °C	100 %	63.93 %	91.63 %
14/08/2021	0 mm	35.65 °C	27.11 °C	29.79 °C	100 %	61.97 %	89.50 %
13/08/2021	0 mm	32.87 °C	28.44 °C	30.07 °C	97 %	72.12 %	86.69 %
12/08/2021	Record Fetch Error						
11/08/2021	0 mm	35.93 °C	27.03 °C	30.59 °C	98.7 %	60.77 %	84.61 %
10/08/2021	0 mm	35.58 °C	26.8 °C	30.25 °C	97.5 %	63.93 %	87.15 %
09/08/2021	0 mm	34.86 °C	26.38 °C	29.39 °C	100 %	67.32 %	90.87 %
08/08/2021	42.67 mm	32.86 °C	24.66 °C	27.67 °C	100 %	72.48 %	94.41 %
07/08/2021	0.25 mm	31.9 °C	26.32 °C	28.22 °C	100 %	83.4 %	95.89 %

06/08/2021	56.13 mm	34.29 °C	25.92 °C	28.51 °C	100 %	68.32 %	93.35 %
05/08/2021	23.37 mm	33.27 °C	24.39 °C	28.02 °C	100 %	68.76 %	93.52 %
04/08/2021	8.38 mm	30.78 °C	26.22 °C	27.09 °C	100 %	84.1 %	98.33 %
03/08/2021	2.79 mm	32.42 °C	26.64 °C	28.49 °C	100 %	76.05 %	90.71 %
02/08/2021	0 mm	34.08 °C	25.79 °C	29.51 °C	99.6 %	65.68 %	85.59 %
01/08/2021	0 mm	34.47 °C	26.11 °C	29.85 °C	98.6 %	63.53 %	84.85 %
31/07/2021	0 mm	32.32 °C	25.71 °C	27.95 °C	97.1 %	74.94 %	90.79 %
30/07/2021	28.7 mm	28.16 °C	25.11 °C	26.34 °C	100 %	89.4 %	96.90 %
29/07/2021	294.13 mm	31.24 °C	25.16 °C	26.46 °C	100 %	83.5 %	98.95 %
28/07/2021	9.91 mm	33.08 °C	26.59 °C	28.67 °C	99.7 %	74.63 %	88.95 %
27/07/2021	11.18 mm	32.69 °C	26.37 °C	28.15 °C	100 %	74.91 %	93.11 %
26/07/2021	4.57 mm	34.68 °C	26.71 °C	29.92 °C	100 %	65.58 %	87.70 %
25/07/2021	4.83 mm	35.78 °C	26.66 °C	29.16 °C	100 %	61.42 %	91.39 %
24/07/2021	0 mm	33.27 °C	26.67 °C	28.91 °C	100 %	73.56 %	92.03 %
23/07/2021	18.54 mm	31.74 °C	26.34 °C	28.00 °C	100 %	79.63 %	94.89 %
22/07/2021	6.1 mm	34.09 °C	26.6 °C	28.93 °C	100 %	66.41 %	90.65 %
21/07/2021	0 mm	33.44 °C	26.28 °C	29.27 °C	100 %	69.08 %	88.97 %
20/07/2021	3.3 mm	31.13 °C	25.42 °C	27.89 °C	100 %	79.62 %	93.45 %
19/07/2021	0 mm	35.14 °C	25.63 °C	29.96 °C	100 %	57.79 %	86.81 %
18/07/2021	0 mm	34.75 °C	26.28 °C	30.06 °C	98 %	62.49 %	86.03 %
17/07/2021	0 mm	35.67 °C	27.2 °C	30.72 °C	96.3 %	60.16 %	82.28 %
16/07/2021	0 mm	35.74 °C	26.76 °C	30.58 °C	100 %	58.02 %	82.39 %
15/07/2021	0 mm	34.21 °C	26 °C	29.71 °C	99.6 %	63.54 %	85.24 %
14/07/2021	0 mm	33.12 °C	27.56 °C	29.95 °C	94.5 %	67.63 %	83.22 %
13/07/2021	Record Fetch Error						
12/07/2021	Record Fetch Error						
11/07/2021	Record Fetch Error						

10/07/2021	Record Fetch Error						
09/07/2021	Record Fetch Error						
08/07/2021	Record Fetch Error						
07/07/2021	Record Fetch Error						
06/07/2021	Record Fetch Error						
05/07/2021	0 mm	35.09 °C	27.32 °C	30.03 °C	100 %	68.34 %	89.42 %
04/07/2021	0 mm	34.92 °C	26.1 °C	29.35 °C	100 %	60.61 %	86.53 %
03/07/2021	0 mm	34.91 °C	25.96 °C	29.79 °C	99.9 %	62.26 %	86.03 %
02/07/2021	0.51 mm	34.46 °C	24.9 °C	29.01 °C	99.6 %	63.98 %	88.15 %
01/07/2021	4.83 mm	34.1 °C	24.45 °C	28.10 °C	100 %	74.04 %	91.55 %
Cumulative Result	**1148.08 mm**	**35.93 °C**	**24.09 °C**	**25.34 °C**	**100 %**	**54.75 %**	**80.42 %**

Source : Vidyasagar University Automatic Weather Station, Centre for Environment Studies (CES)