

GREEN & ENVIRONMENTAL AUDIT REPORT

(2020-2021)



**VIDYASAGAR UNIVERSITY, MIDNAPORE,
WEST BENGAL**

**CONSULTRAIN MANAGEMENT SERVICES,
LAKE ROAD, KOLKATA**

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

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GREEN AND ENVIRONMENTAL AUDIT CERTIFICATE

Academic Year : 2020-2021

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 2020-2021. This efforts taken by Faculty and Students towards environment and sustainable are highly appreciable and commendable.

 (Dr. Binoy Chanda) President, TIEER	 (Dr. Pranab Sahoo) Secretary, TIEER	 (Mrs. Sanchita Bhattacharya) Chief Executive Officer, CMS	 (Dr. Sudipta Kr. Maiti) Expert & Member, TIEER
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Date:- 18/03/2021

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 COMMITTEE 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 and Biogeography
3	Mrs. Sanchita Bhattachariya	Consultant, Consultrain Management services, Kolkata	Environment management
4.	Dr. Kanchan Bhowmik	Organic Scientist and National Expert	Green Technology & Bio Waste Management
5	Dr. Somnath Ghosal	Assistant Prof, G-1, Rural Development, IIT, Kharagpur	Biodiversity, Environment and Green Urban Planning
8	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
9	Dr. Mrinmoy Ghorai	Assistant Professor in Zoology, PanskuraBanomali college	Fauna & Aqua animals
10	Prof. Koushik Chatterjee	Assistant Professor , Dept of Commerce & Management , Sent Xavier's College, Kolkata	Management & Marketing
15	Sri Amal Sasmal	Consultant, EIA and EMS	Environmental management
12	Dr. Chandan Karan	Faculty, Dept. of Geography, S.B. Mahavidyalaya, Kapgari	Land use Survey, Technician for Lab test. and Map Designer
13	Dr. Suvendu Ghosh	Assistant Teacher	Soil Management and Environment Management
14.	Sri Ananda Das	Asst. Teacher & expert	Electro physics
15.	Sri Narasingha Das	Asst, Teacher and Expert	Ecology and Environment Management
16.	Sri Bapi Mahata	Drown Surveyor	Aerial Photography
17	Sri Achiransu Sengupta	Electrical .Engineer	Electrical service and energy management
18	Sri Sarat Chatterjee	Surveyor	Water and Air Quality Measurement
19	Aditi Sengupta	Surveyor	Biodiversity and Fauna Counting

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1. 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.



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 team and Survey Team

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 organization, notably by the Regional Education Association, Midnapore, headed by professor A. K. Gayen of IIT Kharagpur..

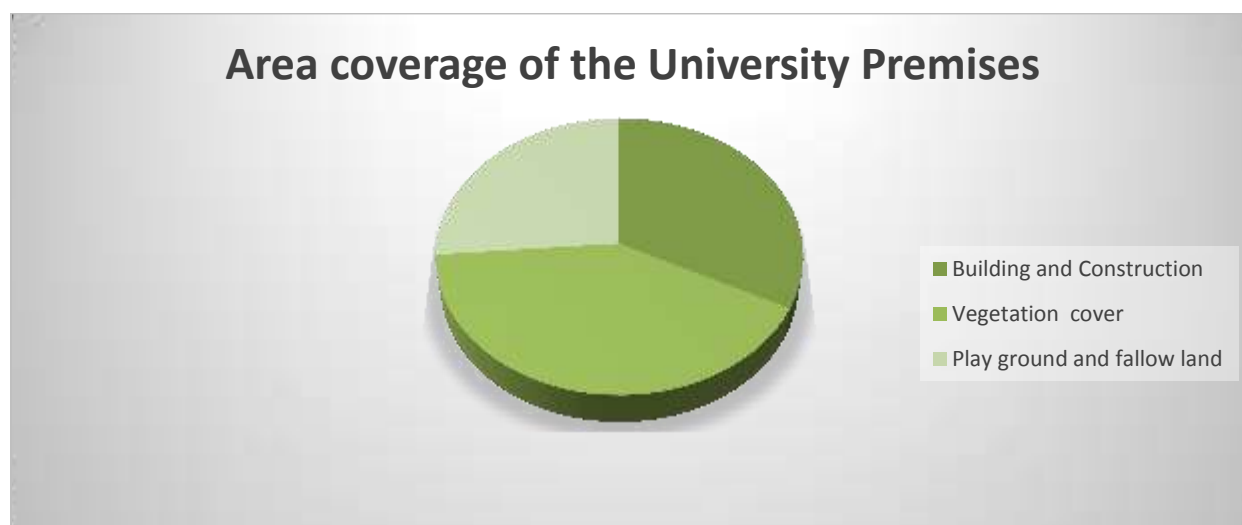
The **University** presently houses **27 PG departments 12 in Humanities and 15 in Sciences while 46 undergraduate colleges apart from 11 courses of 11 other affiliated colleges /institutes. 14 vocational subjects and 6 other specialized courses are also offered at the UG level.**

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	32.5
Vegetation Cover	41.2
Playground and Fallow land	26.3



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	

3.0 Purpose of Green and Environmental Auditing

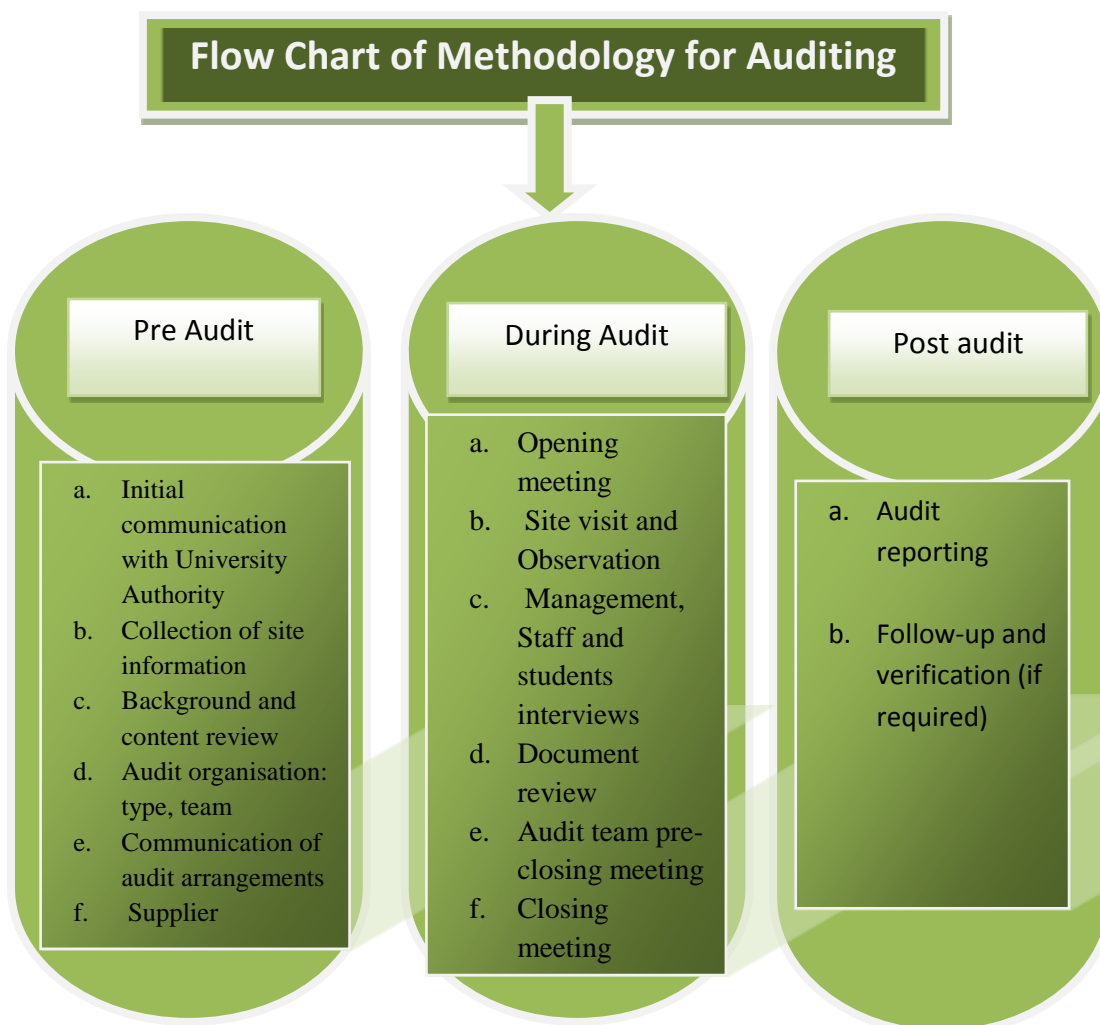
- To develop to more efficient resource management
- To provide basis for improved sustainability

- 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.

3.1 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.



PRE-AUDIT STAGE

The Audit team started the audit at the University Campus on 16th September, 2020

SL.NO	PURPOSE	DATE	REMARKS
1.	Communication with university authority	24th August,2020	Discuss about term and condition
2.	Opening Meeting	6th Sep,2020	Submitted the survey schedule
3.	Collection information about the University	16th Sep,2020	Introduced to Administrative Officer
4.	Campus visit and observation	27th Sep,2020	Outdoor observation with Drown camera& Photo camera
5.	Campus enquiry	19th Nov, 2020	Physically enquiry with expert
6.	Departments visit and enquiry	23th Nov.,2020	Laboratory enquiry
7.	Interview with other stake holder	3rd Dec.,2020	Meet with others stake holder
8.	Interview with staff	13th Dec..2020	Collected different information
9.	Review data and Assessment	16th Dec. 2020 -15th January. 2021	Data generate and drown figures
10.	Pre Closing meeting	7th February, 2021	Meeting with IQAC
11.	Closing Meeting	25th February, 2021	Pre-submission of the Report
12.	Submit audit report	18 th March,2021	Submit of the Report

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

1. 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.

2. Data Analysis - Calculation of energy consumption, analysis of water reused, waste generation & disposal arrangements.

3. 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 from 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.



Green Corridor



Administrative buildings

AUDIT STAGE

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.

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



Aerial Views of the Structural Buildings

Table 2.Total population of the University:

total	
Students -	3962 persons
Teaching, Non-teaching and Other Stakeholders	367 persons
Total	4329 persons
Approximate no of visitor (per day)-15 persons	
No of working days/yr -120 Days	

1. 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

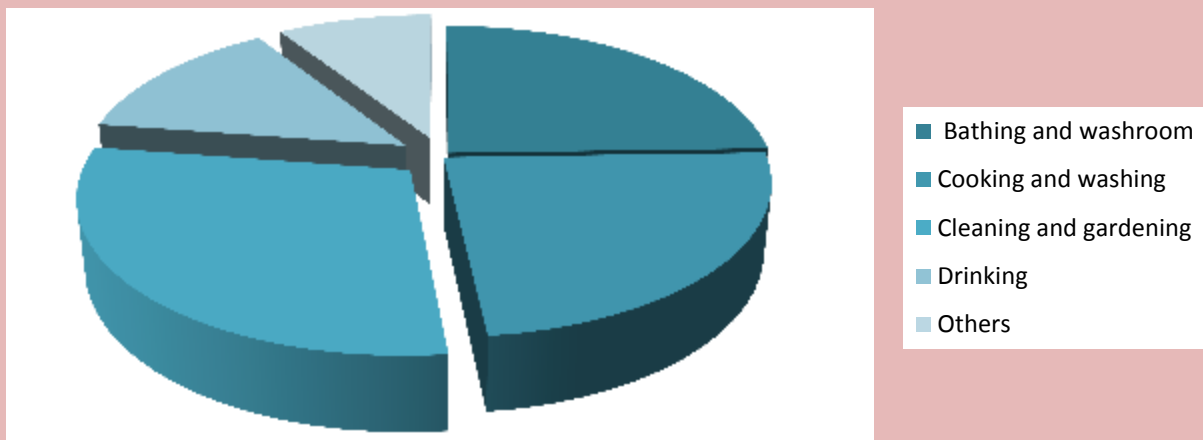
meeting part of the water requirements. It is therefore essential that any environmentally responsible institution examine its water use and Re-use practices.

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 15,000 gl. Liter water per day
c.	Water wastage	The leakage and misuse of water is about 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	24.5
Cooking and washing	23.7
Cleaning and gardening	29.2
Drinking	13.5
Others	9.1

Use of water in Different Purpose



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. 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

2. Energy Efficiency and Energy Management

a	Energy sources	<p>Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.</p> <p>An old incandescent Tube uses approximately 40W while an energy efficient light emitting diode (LED) uses only less than 10 W.</p>
b.	Energy consumption	<p>The useable energy is Conventional and Non-Conventional energy. The used energy is 1185930 unit costing to Rs.11562817/-. Only 9.2% used Energy is Non-conventional energy contributed from Solar</p>

		Power. About 2500sq ft area is covered by the solar plate. The Maximum energy is consumed for Light & Fan amounting to 55.0 % 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 (42PC/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

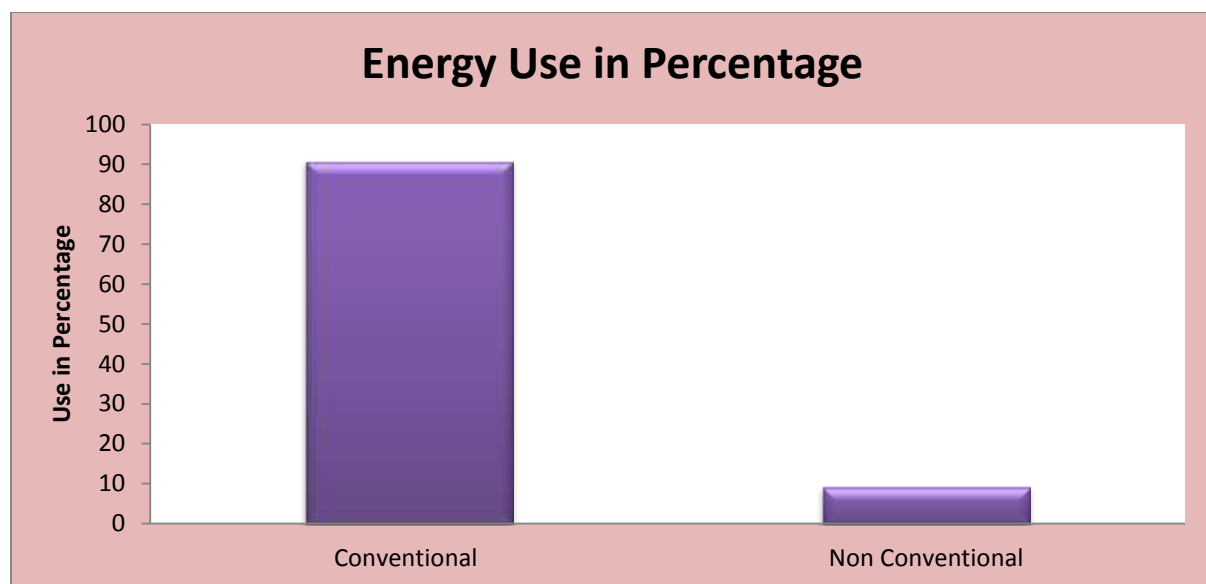
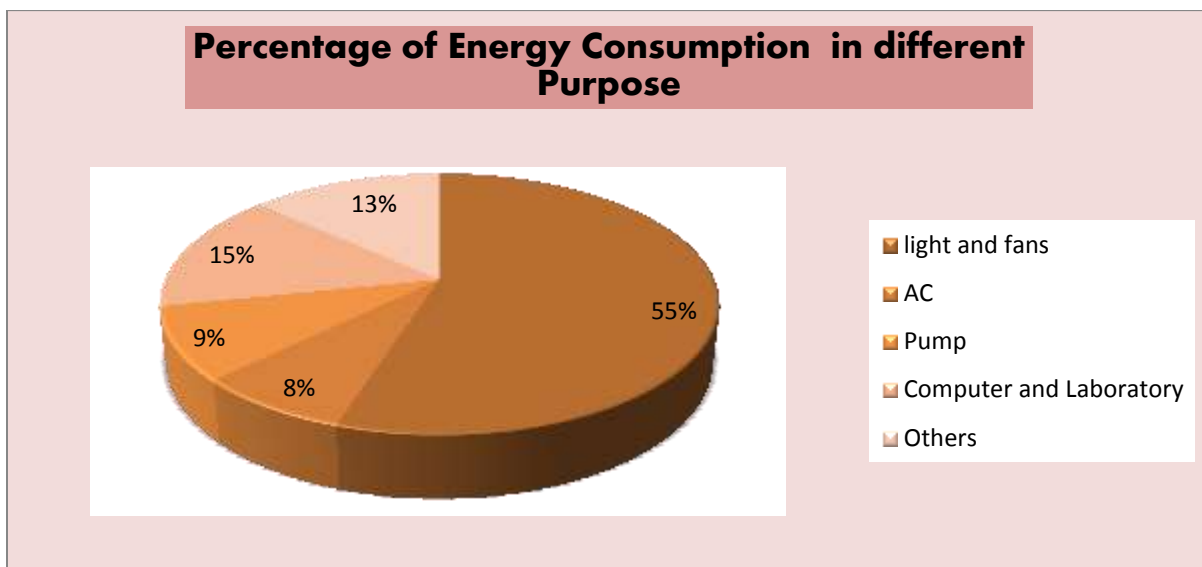


Table 5.Energy Consumption in different Purpose in Percentage:

Energy Consumption in different Purpose	In Percentage
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light and fans	55
AC	7.7
Pump	9
Computer and Laboratory	15
Others	13.3



Source of NCE (Solar Panel)

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) Installation of automatic lights with sensors can be considered.
- c) 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.
- d) 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.
- e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
- 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.
- g) Use of large percentage renewable energy should be considered.

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	390
Gate No.-2	400
Gate No.-3	380
Car Parking Zone	390
Play ground	360

RS-GIS Lab	450
Chemistry lab	410
Library cum lab	425
Botany Lab	400
Stuff quarter Campus	380
Administrative Office	400
Geography lab	410
UCO Bank(Indoor)	420
Student Union	410
Dulung Canteen	430

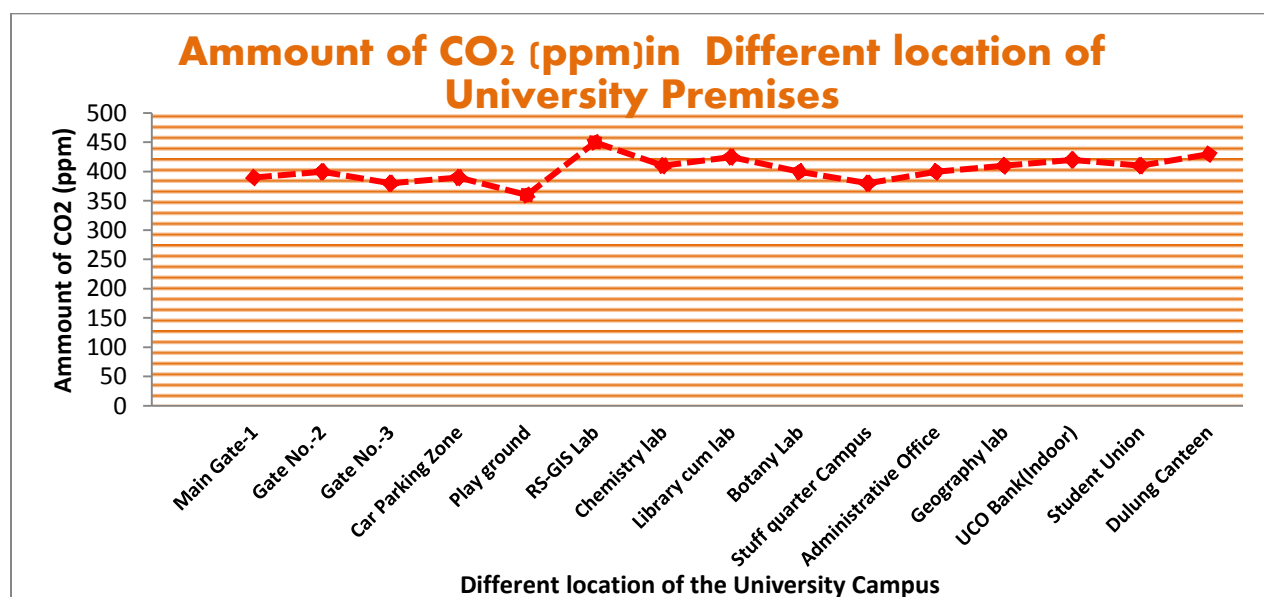


Table 7.Amount of CO₂(in ppm) in the air in different location, session 2019-2020

Amount of CO ₂ (ppm) in the Air in Different places of the University Premises	Amount ofCO ₂ (ppm)
Outdoor	380
Indoor (Class room)	400
Indoor (Laboratories)	420

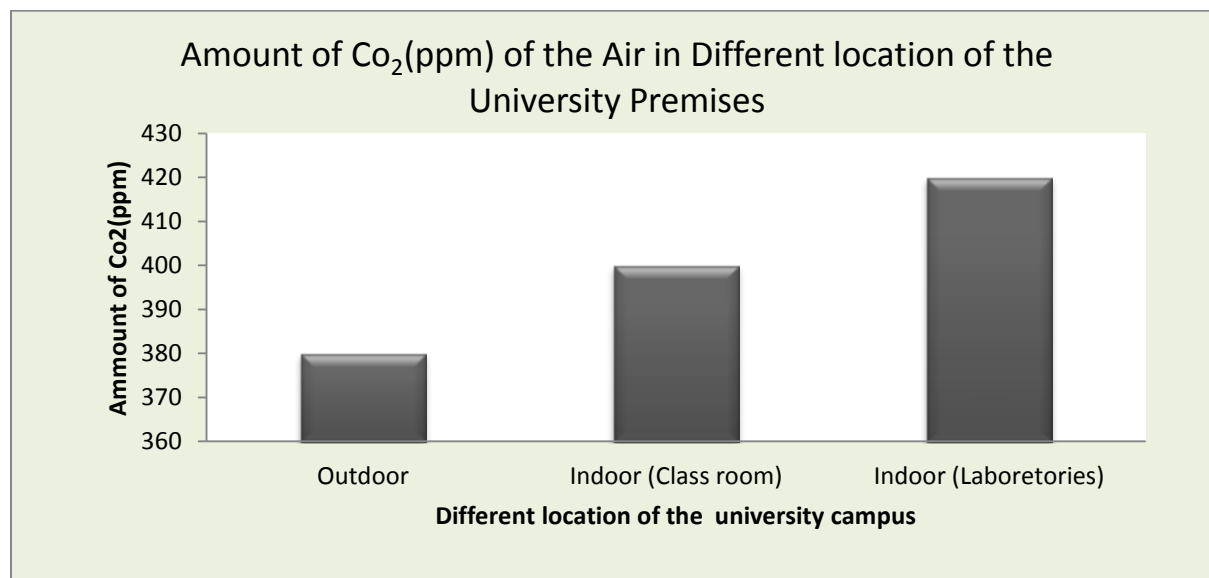
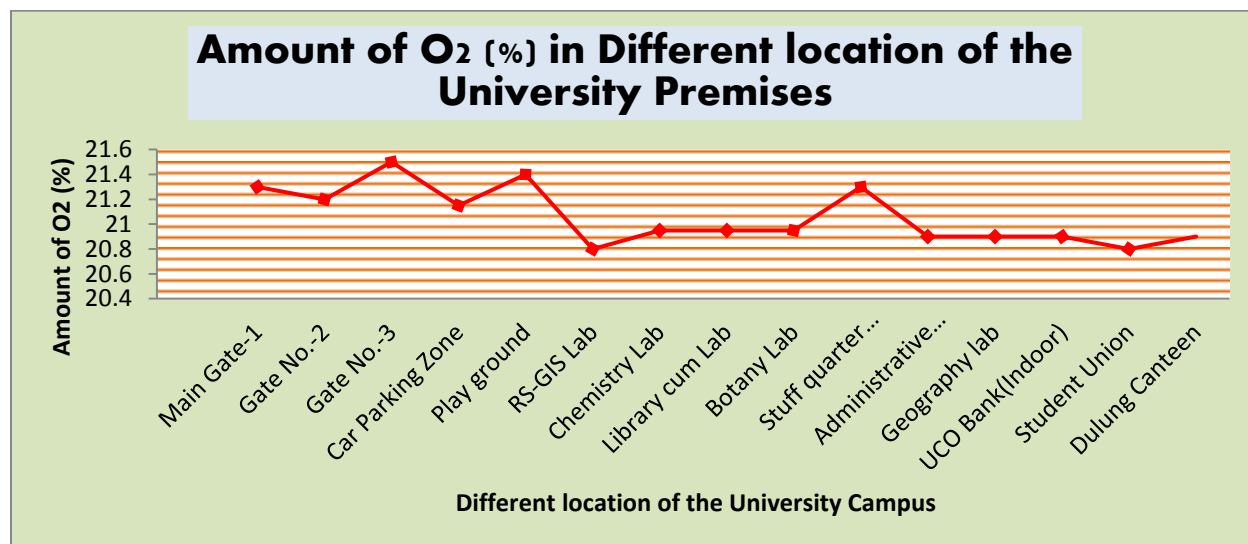


Table 8.Amount of O₂ (%) of the Air in Different location of the University Premises:

Different location of the University Premises	Amount of O ₂ (%)
Main Gate-1	21.3
Gate No.-2	21.2
Gate No.-3	21.5
Car Parking Zone	21.15
Play ground	21.4
RS-GIS Lab	20.8
Chemistry Lab	20.95
Library cum Lab	20.95
Botany Lab	20.95
Staff quarter Campus	21.3
Administrative Office	20.9
Geography lab	20.9
UCO Bank(Indoor)	20.9
Student Union	20.8
Dulung Canteen	20.9



Measurement of Air Quality



Car Parking Zone

- 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.

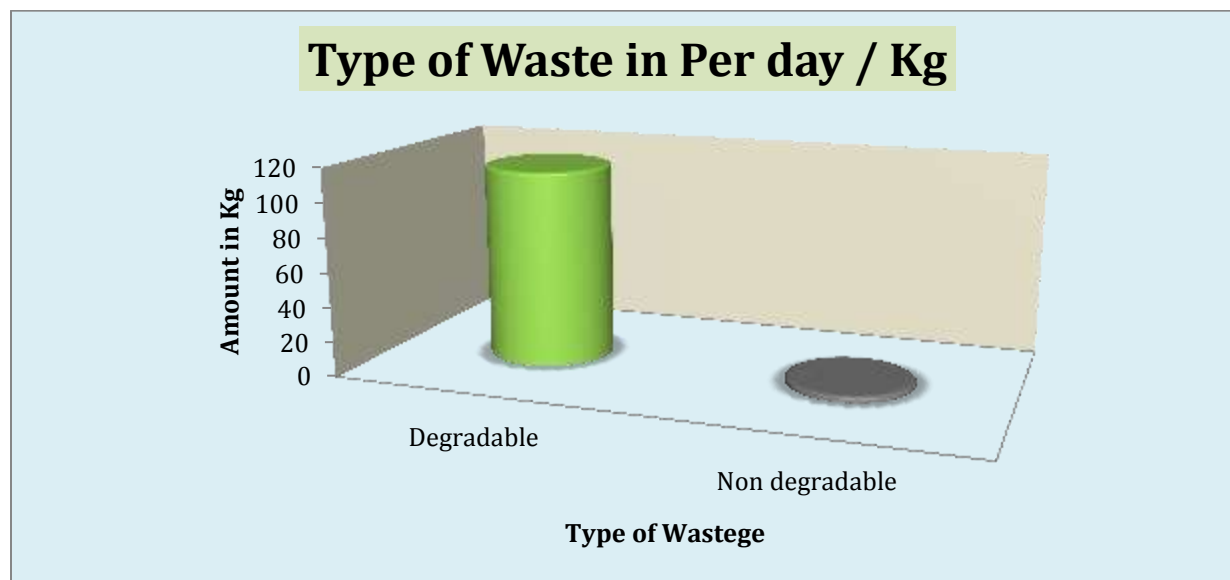
Generation of Waste and Waste Management

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.

Pollution from waste is aesthetically displeasing 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	114
Non degradable	3.5



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.

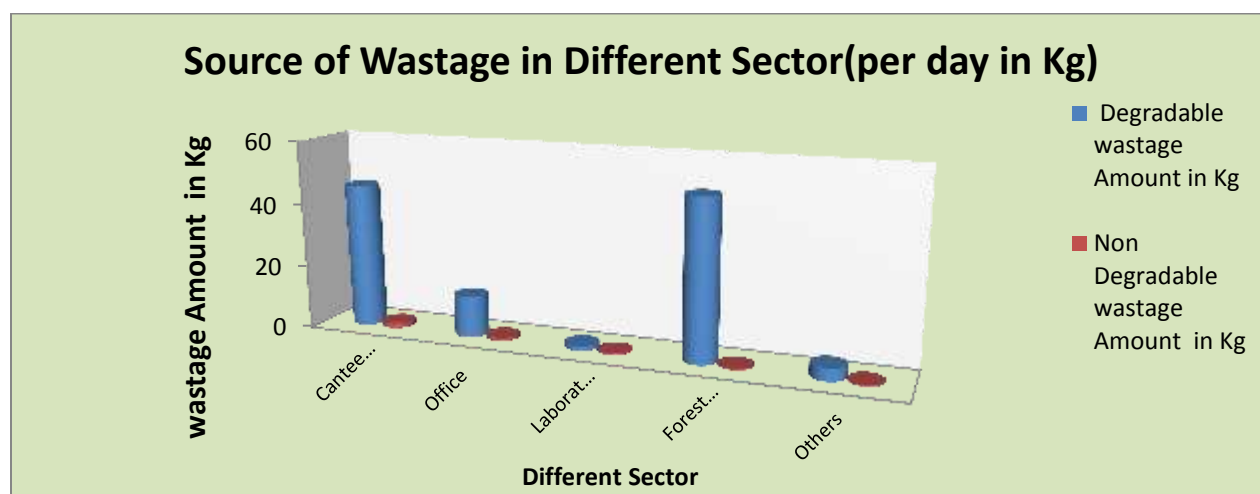
b) Liquid waste - There are bio-chemical wastes generated through various chemical reactions and biological processes. Generally, these are being drained to nearby Surface water bodies



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	45.5	1.5
Office	13	1
Laboratories	1.5	0.5
Forest and Garden	50	0.5
Others	4	0.5



The following are being emphasized during audit of waste management:

- Name of the waste
- Category of waste
- Quantity of waste
- Hazardous effect of the waste
- 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%

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 Midnapur 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.

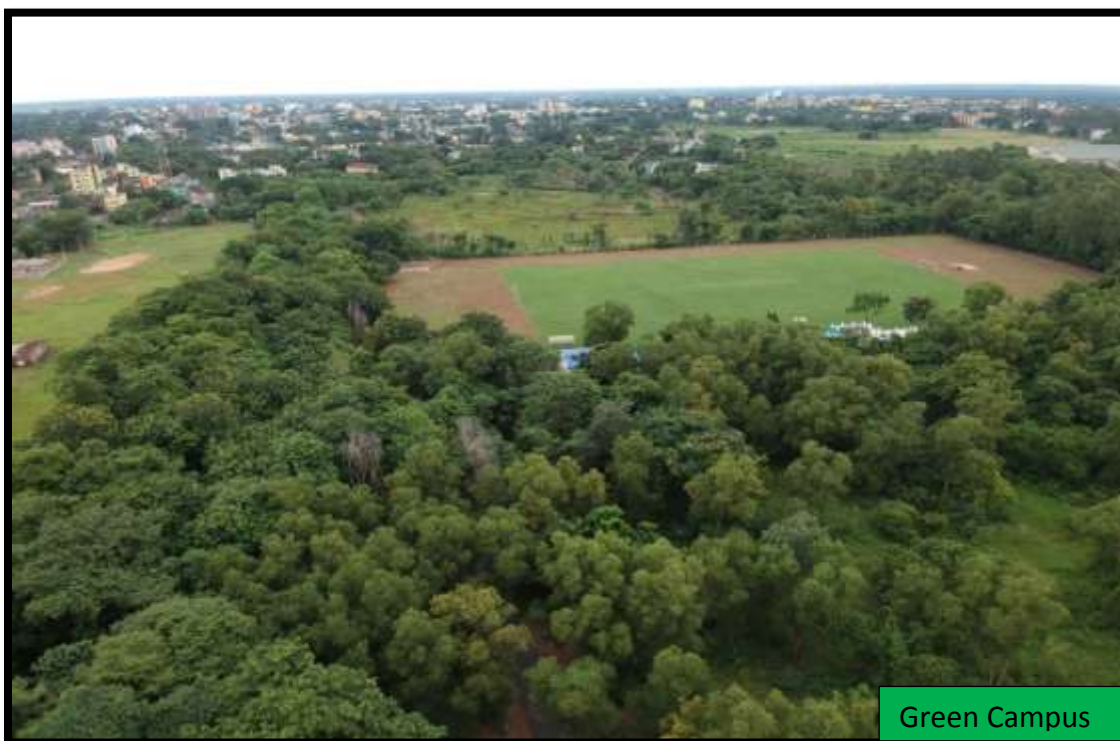


Table 11. Area Coverage of the University Campus:

Area Coverage of University Premises:	Area in Percentage
Building and Construction	32.5
Vegetation Cover	41.2
Playground and fallow land	26.3

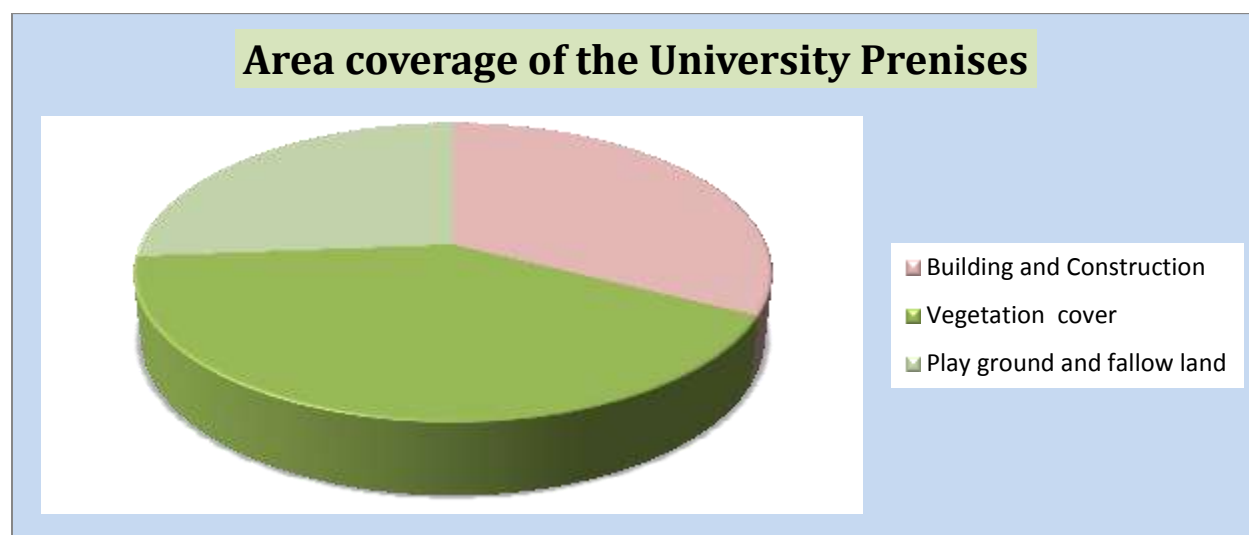


Table 12`. Name of the plants species and their Charactertics:

Tree Quadrat (10m x 10m)

Sl. No.	Scientific name	Local name	Family	GBH (in cm)	Height (in m)
1.	<i>Brideliaretusa</i>	Cosoi	Euphorbiaceae	35	7
2.	<i>Cassia sena</i>	Sena	Fabaceae	105	12
3.	<i>Cassia sena</i>	Sena	Fabaceae	79	10
4.	<i>Cassia sena</i>	Sena	Fabaceae	73	10
.5.	<i>Litsealancefolia</i>	Piplus	Lauraceae	35	7
6.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	93	9
7.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	94	9
8.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	89	9
9.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	88	9
10.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	92	9
11.	<i>Pertophoruminerme</i>	Radhachura	Caesalpiniaceae	55	7
12.	<i>Pertophoruminerme</i>	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.	<i>Clerodendroninfortunatum</i>	Verbenaceae	9
2.	<i>Hemidesmusindicus</i>	Asclepiadaceae	2
3.	<i>Lantana camara</i>	Verbenaceae	2
4	<i>Peltophoruminermae</i>	Caesalpiniaceae	8
.5.	<i>Phoenix acualis</i>	Arecaceae	1
6.	<i>Spilanthus sp.</i>	Asteraceae	52
7.	<i>Stephaniaharnandifolia</i>	Menispermaceae	1
8.	<i>Streblusasper</i>	Moraceae	1
9.	<i>Zizyphusoenoplea</i>	Rhamnaceae	2

Herb quadrat (5m x 5m)

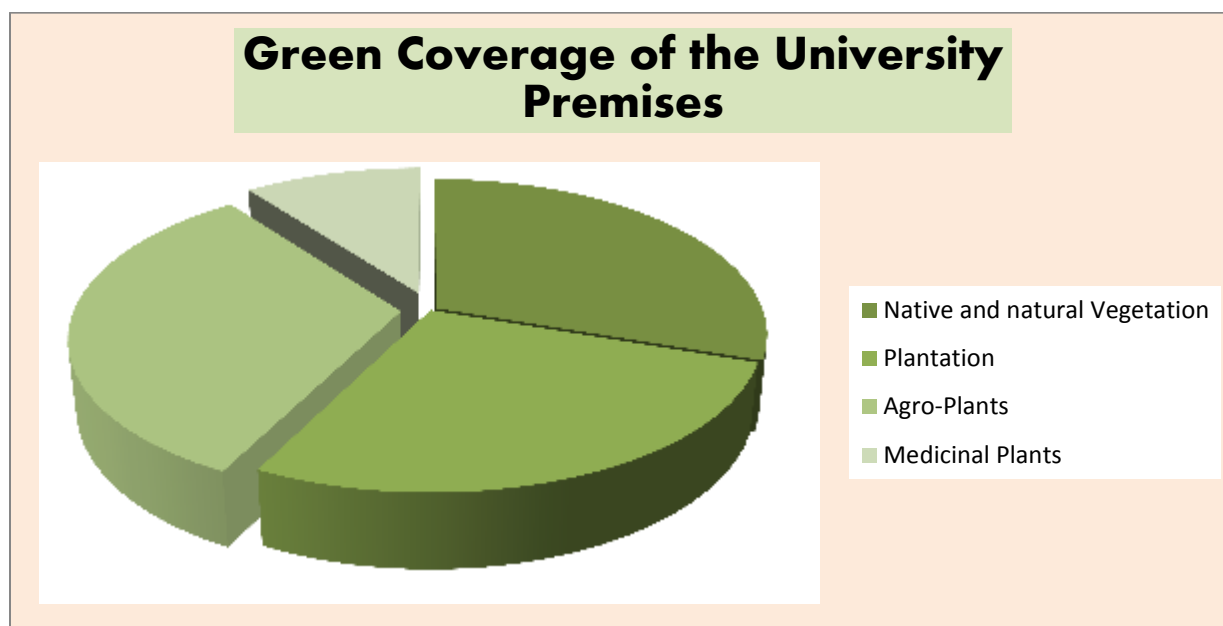
Sl. No.	Scientific name	Family	Number of individuals
1	<i>Achyranthesaspera</i>	Amaranthaceae	2
2	<i>Desmodiumtriflorum</i>	Fabaceae	3
3	<i>Evolvulusalsinoides</i>	Convolvulaceae	3
4	<i>Perotisindica</i>	Poaceae	16
5	<i>Vernoniacinerea</i>	Asteraceae	2
6	<i>Zorniodiophylla</i>	Fabaceae	2



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	27.1
Agro-Plants	32.3
Medicinal Plants	10.3



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 (*Periplaneta americana*).
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.

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	<i>Pycnonotus jocosus</i>	LC
2	Red Vented Bulbul	Bulbul	<i>Pycnonotus cafer</i>	LC
3	House Sparrow	Choti Charai	<i>Passer domesticus</i>	LC
4	Eurasian	Par ghughu	<i>Streptopelia decora</i>	LC

	Collared Dove			
5	Oriental Turtle Dove		<i>Streptopaliaorientalis</i>	
	Spotted Dove	Chhiteghughu	<i>Streptopeliachinensis</i>	DD
6	Rock Dove	Rock Pigeon	<i>Columba livia</i>	LC
	Black Drongo	Finga	<i>Dicrurusmacrocerus</i>	LC
7	Asian Pied Starling	GuyeSalik	<i>Sturnus contra</i>	LC
8	White-breasted Kingfisher	SandabukMachhranga	<i>Halcyon smyrnensis</i>	VU
9	Common Kingfisher	ChottoMachhranga	<i>Alcedoatthis</i>	LC
10	House Crow	Kak	<i>Corvussplendens</i>	LC
11	Jungle Babbler	Chhatore/Satbhai	<i>Argyastriatus</i>	LC
12	Black-headed Oriole	BeneBau	<i>Oriolusxanthornus</i>	LC
13	Eurasian Golden Oriole	SonaBau	<i>Oriolusoriolus</i>	LC
14	Common Myna	Salik	<i>Acridotherestrictis</i>	LC
15	Blue Rock Pigeon	GolaPayra	<i>Columba liviadomestica</i>	
16	Common Hoopoe	Mohonchura	<i>Upupaepops</i>	LC
17	Asian Koel	Kokil	<i>Eudynamysscolopacea</i>	LC
18	Rose-ringed Parakeet	Tia	<i>Psittaculakrameri</i>	LC
19	Brown Shrike	Karkata	<i>Laniuscristatus</i>	LC
20	Indian Treepie	HandiChacha	<i>Dendrocittavagabunda</i>	LC

Table 15.The mammalian checklist is as follows:

SL. NO	COMMONNAME	BENGALINAME	SCIENTIFICNAME	IUCN RED LIST
1	FivestripedPalm Squirrel	Kath Berali	<i>Funambuluspennantii</i>	Least Concern (LC)
2	Free-rangingCat	Biral	<i>Felisdomesticus</i>	DD
3	Free-rangingDog	Kukur	<i>Canisfamiliaris</i>	DD
4	AsianPalmCivet	Bham	<i>Paradoxurushermaphroditus</i>	LC

5	FieldRat	MethoIndur	<i>Bandicotabengalensis</i>	LC
6	GreyMongoose	Beji	<i>Herpestesedwardsii</i>	LC
7	HouseMouse	NengtiIndur	<i>Musmusculus</i>	LC
8	Small Indian Civet	Kotas	<i>Viverriculaindica</i>	LC
9	Bengal Fox	Fox	<i>Vulpesbengalensis</i>	LC
10	Indian gray mongoose	Neul	<i>Herpestesedwardsii</i>	LC

Table 16. Amphibia checklist as occurring within the University campus.

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

Table 17. Thereptilianfaunas are observed below:

S. No	Oder	Common name	Scientific name	IUCN Status
1	Squamata	Stripped keelback	<i>Amphiesmastolatium</i> (Linnaeus, 1758)	NE
2	Squamata	Common Kukri	<i>Oligodonarnensis</i> (Shaw, 1802)	NE
3	Squamata	chckeredkeelback snake	<i>Fowleapiscator</i> (Schneider, 1799)	NE

4	Squamata	Monocled cobra	<i>Najakaouthia</i> (Lesson, 1831)	LC
5	Squamata	Spectacled cobra	<i>Najanaja</i> (Linneaus, 1758)	LC
6	Squamata	Common krait	<i>Bungaruscaeruleus</i> (Schneider, 1801)	NE
7	Squamata	Russell's viper	<i>Daboiarusselii</i> (Shaw &Nodder, 1797)	NE
8	Squamata	Indian Garden lizard (Girgiti)	<i>Calotesversicolor</i> (Daudin, 1802)	NE
9	Squamata	Indian house gecko (Tictiki)	<i>Hemidactylusflaviviridis</i> (Ruppel, 1840)	NA
10	Squamata	Spotted house gecko	<i>Hemidactylusparvimaclatus</i> (Deraniyagala, 1951)	NA
11	Squamata	Jerdon Snake eye	<i>Ophisopsjerdonii</i> (Blyth,1853)	LC
12	Testudine	Indian flapshell turtle <i>Lissemys punctate</i> (Peter's,1854)	<i>Lissemys punctate</i> (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%

Review 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.

POST AUDIT STAGE

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.

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	15000 gl liter
4	Misuse of water in daily	Leakage, overflow and Misuse-567 liter
5	Maximum used of water per day - Clinging and Gardening purpose	29.20% (16556 liter)
6	Amount of water for used per day- Drinking Purpose	13.5% (7655 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 -1185930 Unit, Rs.-11562817/- Per Year

a) Conventional energy-1080705Unit

b) Nonconventional energy-105225 Unit Less-Rs.1025944/ .Rs. for Paid-Rs.-10536873/

❖ Fossil fuel consumption per Year:

a. Number of Gas cylinders used for cooking purpose(Hostels& Canteen) – 420PC

b. Number of Gas cylinders used in Chemistry Laboratory - 2PC

c. Diesel used for green Generater-1250 liter

❖ Number of Green Generators - 4

❖ Cost of generator fuel – Rs.11500 /month

Energy Audit and Assessment (Vidyasagar University)

Sl. No.	Object and Parameter	Observation and Finding
1	Source of energy (conventional)	90.8%
2	Source of energy (Non-conventional)	Solar-9.2%
3	Total consumption of Electric Power	1185930 unit
4	The maximum use of Electric Power	Conventional - 92%
5	Maximum energy consumption in the purpose	Light and fans - 516462 unit AC- 193673 unit
6	Energy Consumption in Computer & Lab.	387347 unit
7	No. of LPG Gas cylinder for coking purpose	420
8	No. of LPG Gas cylinder used in Laboratories	2
9	Amount of diesel used for green generator	1250 liter
10	No. of Computers and use of energy	820 (246 Kwh/Day)
11	No. of AC and use of energy	370(166.5 Kwh/Day)
12	No. of Street sodium vapor light	1600(2880Kwh/Day)

Energy consumption in different purpose, 2020-21		
1	Lights & Fans	516462 unit
2	Air Condition	193673 unit
3	Lifting of water(HP pump)	62558unit
4	Computer & Dept. Lab	387347 unit
5	Others(CCTV,TV, water cooler & others)	129116unit

c. Wastes

- Total Students -3962 persons
- Other Stakeholders – 367 persons
- Total Stakeholders -4329 persons
- 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	114 (Kg/Day)
2	Non degradable	3.5(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 Kitchen garden and University premises area.

Table 18.Biodiversity and Green Coverage (Vidyasagar University):

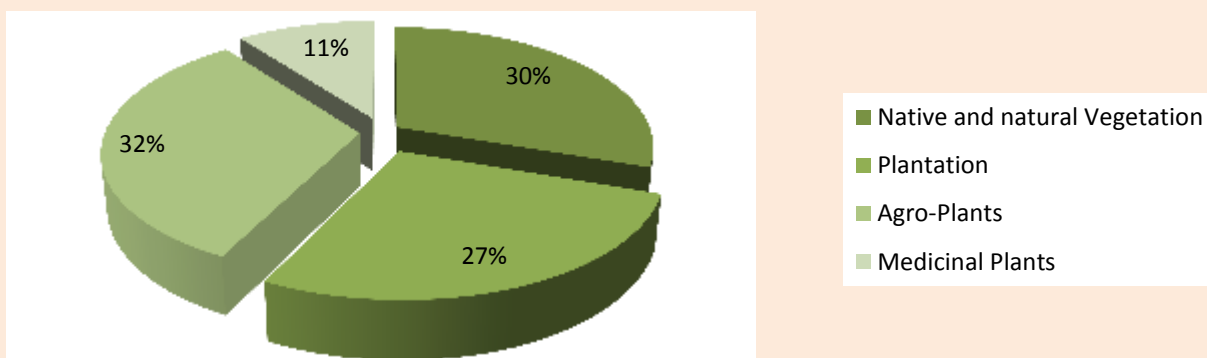
SL	Object and Parameter	Observation and Finding
1	Vegetation coverage area	41%(56.90 Acre)
2	Types of green coverage	<ul style="list-style-type: none"> ➤ Native and Natural Vegetation- 30.3% ➤ Medicinal plants-10.3% ➤ Agro-plants-32.3%
3	Different types of Animal	<ul style="list-style-type: none"> ➤ Mammals -Squirrel, Rat, Free ranging Cat, Free ranging Dog, Field Rat, Asian Palm Civet, Grey

		<p>Mongoose, Bengal Fox, Indian Grey Mongoose etc.</p> <ul style="list-style-type: none"> ➤ Amphibian-Snake, Frogs ➤ Birds- Crow, Common Moyna, Bat, Pigeon, etc. ➤ Insects- Ants, Butterfly, Spider etc.
4	Biodiversity and Green Management Programme	<ul style="list-style-type: none"> ➤ Awareness program arrange by- Dept. of Geography, Dept. of Zoology and Dept. of Botany among the students and Staff 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	27.1
Agro-Plants	32.3
Medicinal Plants	10.3

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. Thereptilianfaunas areobservedbelow:

S. No	Oder	Common name	Scientific name	IUCN Status
1	Squamata	Stripped keelback	<i>Amphiesmastolatum</i> (Linnaeus, 1758)	NE
2	Squamata	Common Kukri	<i>Oligodonarnensis</i> (Shaw, 1802)	NE
3	Squamata	chcekeredkeelback snake	<i>Fowleapiscator</i> (Schneider, 1799)	NE
4	Squamata	Monocled cobra	<i>Najakaouthia</i> (Lesson, 1831)	LC
5	Squamata	Spectacled cobra	<i>Najanaaja</i> (Linnaeus, 1758)	LC
6	Squamata	Common krait	<i>Bungaruscaeruleus</i> (Schneider, 1801)	NE
7	Squamata	Russell's viper	<i>Daboiarusselii</i> (Shaw	NE

			&Nodder, 1797)	
8	Squamata	Indian Garden lizard (Girgiti)	<i>Calotesversicolor</i> (Daudin, 1802)	NE
9	Squamata	Indian house gecko (Tictiki)	<i>Hemidactylusflaviviridis</i> (Ruppel, 1840)	NA
10	Squamata	Spotted house gecko	<i>Hemidactylusparvimaclatus</i> (Deraniyagala, 1951)	NA
11	Squamata	Jerdon Snake eye	<i>Ophisopsjerdonii</i> (Blyth,1853)	LC
12	Testudine	Indian flapshell turtle <i>Lissemys punctate</i> (Peter's,1854)	<i>Lissemys punctate</i> (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. Common Tiger (*Danaus chrysippus*)
2. Common lime (*Papilio demoleus* Linnaeus)
3. Common Mormon (*Papilio polytes* Linnaeus)
4. Grey pansy (*Junonia atlites* Linnaeus)
5. Tawny coster (*Acraea violae* Fabricius)
6. Common Pierrot (*Castalius rosion* Fabricius)
7. Striped Tiger (*Danaus genutia*)
8. Common Grass Yellow (*Eurema hecabe*)
9. Angled Castor (*Ariadne ariadne*)
10. Psyche (*Leptosia nina*)
11. Common Crow (*Euploea core*)
12. Common Mormon Female (*Papilio polytes*)



13. BlueJay(*Graphiumdoson*)
14. SpotSwordTail(*Graphiumnomius*)
15. CommonJezebel (*Delias eucharis*)
16. CommonAlbatross (*Appiasalbina*)
17. CommonFourRing(*Ypthimahuebneri*)
18. GramBlue(*Euchrysops snejus*)
19. Peacockpansy(*Junoniaalmana*)
20. MottledEmigrant(*Catopsiliapyranthe*)
21. CommonFive Ring(*Ypthimabaldus*)
22. LemonPansy(*Junonialemonias*)



Routine Green Practices

World Water Day-21st March, World Earth Day- April 22, World Biodiversity Day- May 22, World Environment Day – June 5, Ozone Day – September 16

Awareness seminars are organized on various environmental problems.

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'

The Green campus drive is an initiative of the University to protect the Environment. The University has declared 'No Plastic' & No Smoking' zone 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. There are two pond 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, 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 – 222
- Number of persons using cars – 16
- Number of persons uses two wheelers – 136
- Number of students uses Buses - 85
- Number of persons using other transportations – 2865
- Number of visitors per day – 10
- Number of Students staying in the hostel – 10
- 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/-

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.

SUMMARY

- I. The environmental awareness initiatives are adequate.
- II. The University campus is plastic free and maintained the outdoor air quality.
- III. The installation of solar panels, Fire extinguishers training, organic vegetable cultivation, Vermi composting practices are inadequate.
- IV. There is Nature club of the University towards its environmental performance for Community development.
- V. Indoor air quality of the laboratories is very uncomfortable and inhospitable.
- VI. Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
- VII. Programs on green initiatives have to be increased. Campus is declared “Green Campus”
- VIII. Fully carbon foot prints and wastes free zone actions should be taken to maintain this.
- IX. 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 25%

** M denote- Taken management policy level 15%-25%

*** L denote-Taken management policy level below 15%



Environmental Education

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

- ❖ 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.
- ❖ 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
- ❖ Implement chemical treatment system for waste water from the Laboratories.

Awareness on Carbon Consumption

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

Common Recommendations

- ✓ 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

- ✓ 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

Criteria Wise Recommendations

Water

- Remove damaged taps and install sensitive taps is possible.
- Drip irrigation for gardens and vegetable cultivation can be initiated.
- 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.
- Awareness programs on water conservation to be conducted.

Energy

- ✓ 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.
- ✓ More energy efficient fans, tubes and bulb should be replaced.
- ✓ Automatic power switch off systems may be introduced.

Waste

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

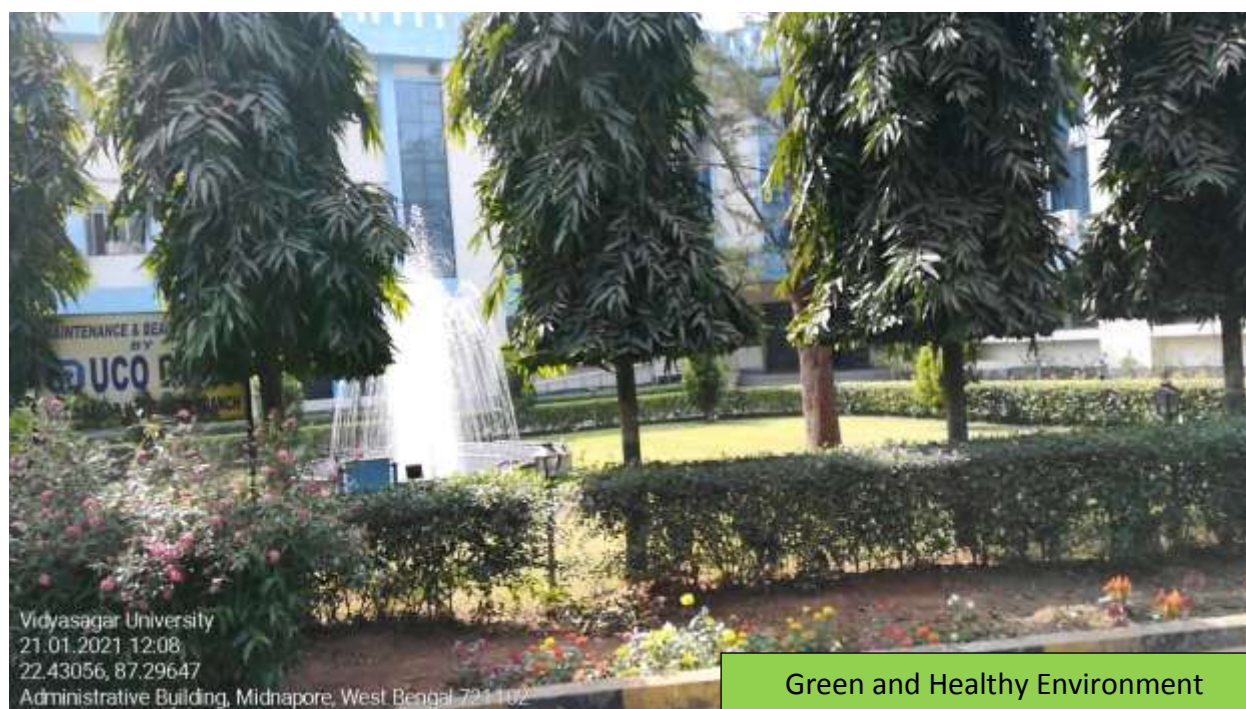
Green Campus

- ✓ All trees in the campus should be named scientifically.
- ✓ Create more space for planting in vacant land.
- ✓ 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
- ✓ Grow potted indoor plants at verandah, class rooms and Laboratories.
- ✓ Create automatic drip irrigation system during summer holidays.
- ✓ Not just celebrating environment day but making it a daily habit.
- ✓ Beautify the university building with indoor plants
- ✓ Providing funds to nature club for making campus more green
- ✓ Encouraging students not just through words, but through action for making the campus green

- ✓ Conducting competitions among departments for making students more interested in making the campus green.

Carbon footprint

- ❖ Establish a system of carpooling among the staff and visitors to reduce the number of four wheelers coming to the university.
- ❖ Establish the indoor plants in computer lab and other laboratories to CO₂ 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.



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Green and Healthy Environment