

**GREEN AND ENVIRONMENTAL  
AUDIT REPORT  
(2022-2023)**



**SEVAYATAN SIKSHAN MAHAVIDYALAYA,  
JHARGRAM, WEST BENGAL**

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

**TROPICAL INSTITUTE OF EARTH AND  
ENVIRONMENTAL RESEARCH (TIEER),  
MEDINIPUR**

## **ACKNOWLEDGEMENT**

We, The Environment Audit Team thank the management of Sevayatan Sikshan Mahavidyalaya 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:

- ❖ Principal of the College
- ❖ IQAC Members
- ❖ Teaching & supporting staff

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



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Reg. No. S/11/42578 of 2006-07

Office address: M-10, Bidhannagar, Medinipur-721101, W.B., India

# GREEN AUDIT CERTIFICATE

Academic Year: 2022-2023

This is to certify that Sevayatan Sikshan Mahavidyalaya, Sevayatan, Jhargram, 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 Green Audit with moral support of Honorable Principal, IQAC Team, Staff and Students for academic year 2022-2023. This efforts taken by Faculties and Students towards environment and sustainable are highly appreciable and commendable.

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## AUDIT EXPERT MEMBERS

The Committee members are listed below:

SL. No.	NAME	DESIGNATION	AREA IN INTEREST
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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, & Member, TIEER, ISO-9001,14001& 50001Cerfied Auditor.	Environment Management
4.	Dr. Pijush Kanti Panja	Associate Professor, Dept. of Geography, Haldia Govt. College	Ecology and Environment management
5.	Dr. Sudipta Maiti	Faulty, Dept. of Botany, Raja N.L. Khan Womens' College, Midnapore	Plants Diversity & Carbon stocking, Green Management
6.	Dr. Mrinmoy Ghorai	Assistant Professor in Zoology, Panskura Banomali college.	Fauna & Aqua animals and Biodiversity conservation
7.	Dr. Chandan Karan	Faculty, Dept. of Geography, S.B. Mahavidyalaya, Kapgari	Land use Survey, Technician for Lab test. and Map Designer
8.	Sri Ananda Das	Asst. Teacher & expert	Electro physics
9.	Dr. Sumita Swar	Faulty, Dept. of Environment, New Alipure College	Water and Waste Management
10.	Sri Sarat Chatterjee	Surveyor & Assistant Resercher	Water and Air Quality Measurement
11.	Sri Sanjib Mahata	Surveyor & Expert in RS &GIS	Map Designer

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## 1.0 INTRODUCTION:

The term 'Green' stands for Resource balance, Quality environment, Recycled products and Ecofriendly 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 college. Green auditing is a means of assessing environmental performance. Green audit is a valuable means for a College to determine how and where they are using the most energy or water or other resources; the College 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 analysis 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 out of Green and Environment 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 College – aerial view
- To document the floral and faunal diversity of the College
- 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
- ENERGY MANAGEMENT
- AIR QUALITY AND CARBON FOOTPRINT
- WASTE MANAGEMENT
- E-WASTE 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 College campus. The committee has suggested short term as well as long-term suggestions for improved environmental conditions to a higher level



and authorities and all stakeholders of the College conform that they will give due attention and utilize opportunities for identified improvements.

## 1.2 About the College :

This sounds highly significant about 'Sevayatan Sikshan Mahavidyalaya' as it is popularly known today. From a modest beginning this fledgling college has leapfrogged on the path of outstanding development and attained Govt. Sponsored Status and excellence with regard to progress and performance in the lately declared District of Jhargram.

In view of the growing demand for a Teachers' Training College, it was discussed and decided to open a Govt. Sponsored Postgraduate Teachers' Training B.T. College at Sevayatan in the north east outskirts of Jhargram town. The decision was materialized and resources optimized when the Philanthropic Trustee of Sevayatan took the onus on them by donating substantial quantity of land and offering all possible succour for the establishment of the college in the year 1959.

The college was established in 1959 by Swami Satyananda Giri Maharaj, as residential Teachers' Training College for students sponsored by Govt. of West Bengal. The monk Suddhananda Giri Maharaj of Sevayatan, an ardent champion of education was chiefly responsible for opening a number of educational Institutions at Sevayatan locality of which the establishment of the B. Ed. College remains a land mark achievement throughout his ascetic life.

On behalf of the college I must convey heartiest gratitude to the Trustees for their pioneering efforts to bring the first ray of true modernity and education. Coupled with their ameliorative initiatives in the obscure and educationally challenged area some six decades back.

The first flame of education initiated by the Mission is continues burning more vigorously today. With the progress of time this college has attained its burgeoning state with inception of M.A. in Education that started in the year 2012.

I get pretty amped up to say that students seeking admission both to B.Ed. and M.A. classes form bee-line in this hallowed Institution every academic year, possibly attracted by the enviably healthy academic climate and the supportive environment prevailing over here.

Currently the college building wears a new look for the renovation, reconstruction and facelift works done so far, separate building for M.A. courses has been constructed which connects the main college building. Well-equipped modern smart classrooms both for B.Ed. and M.A. classes with modern teaching aids have

been arranged for the students. It is quite heartening that the NET and SET aspirants are offered special coaching by the college that would help them crack the competitive examination. The college has big hostels in its precincts both for boys and girls hailing from distant places. The whole college area along with the main college building is surrounded by strong and durable boundary walls on all sides to ensure safety and security of the inmates. Besides, we have a spacious and well-equipped gymnasium where Alexander technique is emphasized upon. The auditorium hall has recently been built in our college premises where efforts are made to create an ambience of culture and promotion of culture as well as cultural integration. With the gradual development of the college outreach initiatives are also taken up with real earnestness by all concerned.

The 'Heart of the College' the library is housed in a big first floor building with a rich collection of various old and new books for the increasing number of users along with Internet facilities (WiFi).

### **College History**

The Sevayatan Sikshan Mahavidyalaya was founded by Swami Satyananda Giri Mahararaj in 1959 as Government Sponsored Teachers Training College. The College was the only Teachers' Training College after Kolkata (From Howrah district to Purulia District). This is the fourth oldest college in West Bengal under Calcutta University.

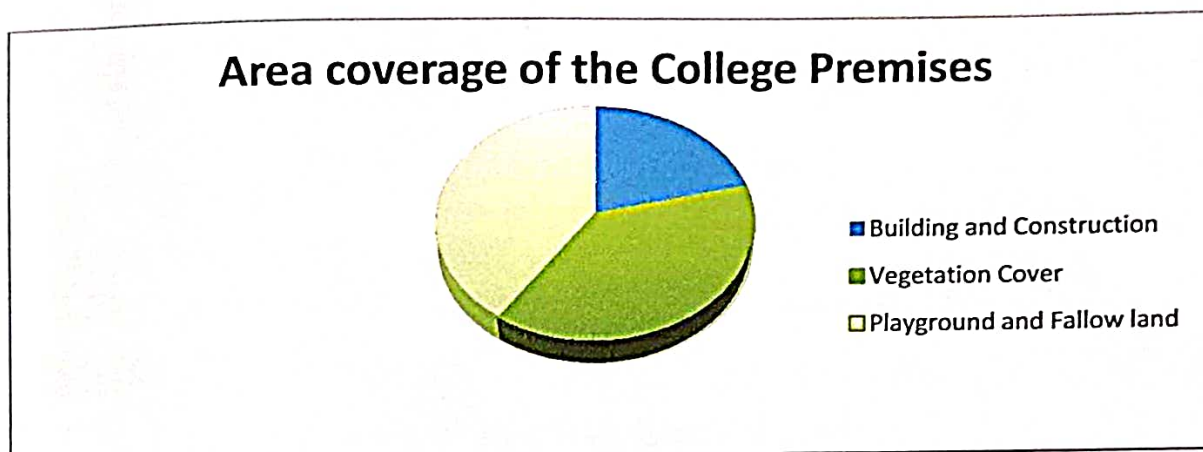
From 1988 the affiliation was shifted to from Calcutta University to Vidyasagar University. M.A in Education has been introduced in Sevayatan Sikshan Mahavidyalaya under Vidyasagar University from 2012-2013. In 2015 the B.Ed. course was affiliated under WBUTTEPA as per higher education department, Govt. of West Bengal. The college is a Government Grant-in -aid college and it functions through the management of its Governing Body. The Assistant Professors are experienced and qualified who are recommended by West Bengal College Service Commission (WBCSC) and appointed by College Governing Body. The library is automated with SOUL 2.0 Library Management software and digitalization of Library is under process. The library has subscribed more than 6000 Journals and 1,99,500 eBooks under N-LIST programme of INFILBNET.

### College at A Glance

- Recognised by National Council for Teacher Education (as per the NCTE regulations, 2014 with the intake capacity of 100 for the B.Ed. students.
- M.A Programme in Education introduced in the year 2012-13.

**Table 1 Area Coverage of the College Campus**

Area Coverage of College Premises:	Area in Percentage
Building and Construction	21.2
Vegetation Cover	38.3
Playground and Fallow land	40.5

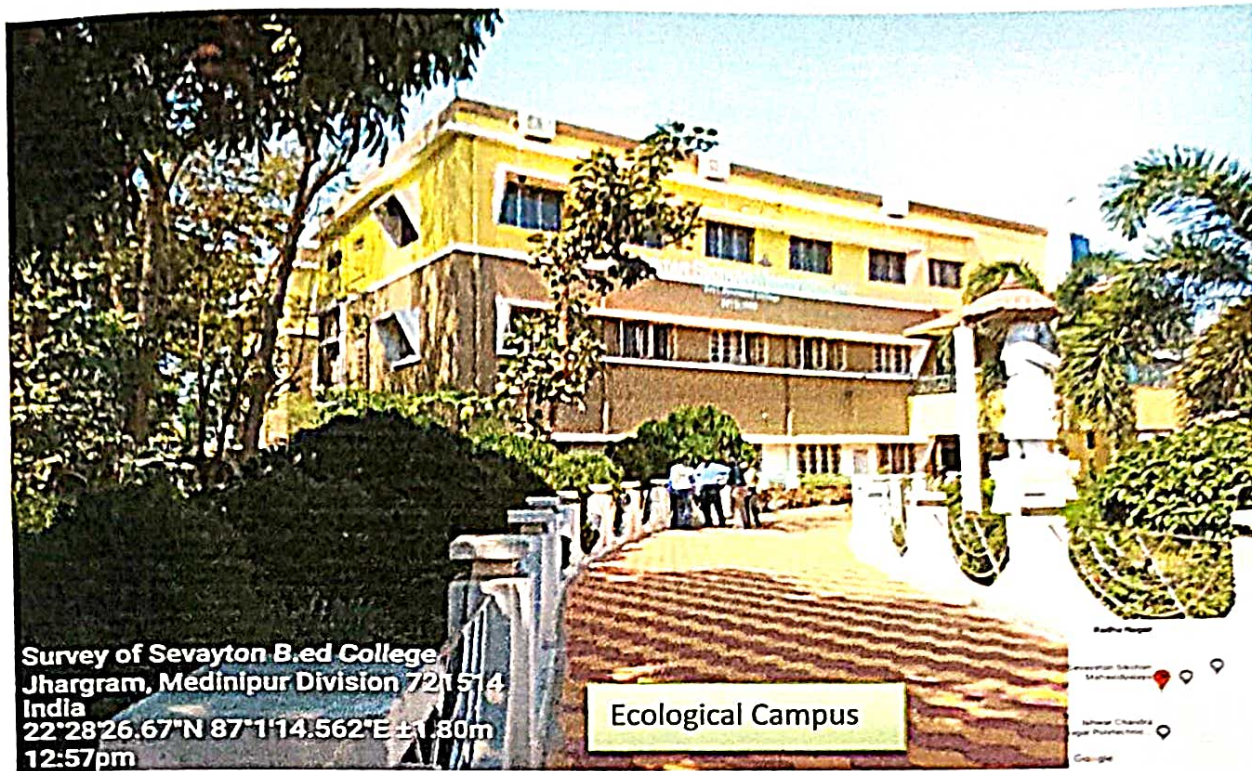


**Fig. 1 Area Coverage of College Premises**

### General Information:

Total area of the college campus – 5.18acres,  
 Building area: 1.1acres,  
 Green & Vegetated area: 1.98acres.  
 Play Ground & Vacant land area: 2.1acre  
 Departments: B.Ed & M.A in Education ( 11 Dept.)  
 Laboratories: 09  
 Students: 303  
 Teaching Faculties: 18  
 Non-teaching staff: 21  
 Others stakeholder: 08  
 Total Stake holders: 350  
 Total classrooms: 25

Auditorium /Seminar hall: 03  
Hostels: 03  
Hostel students: 130  
Gymnasium Hall : 01  
Smart class rooms: 04



### 1.3 Purpose of Green and Environmental Auditing:

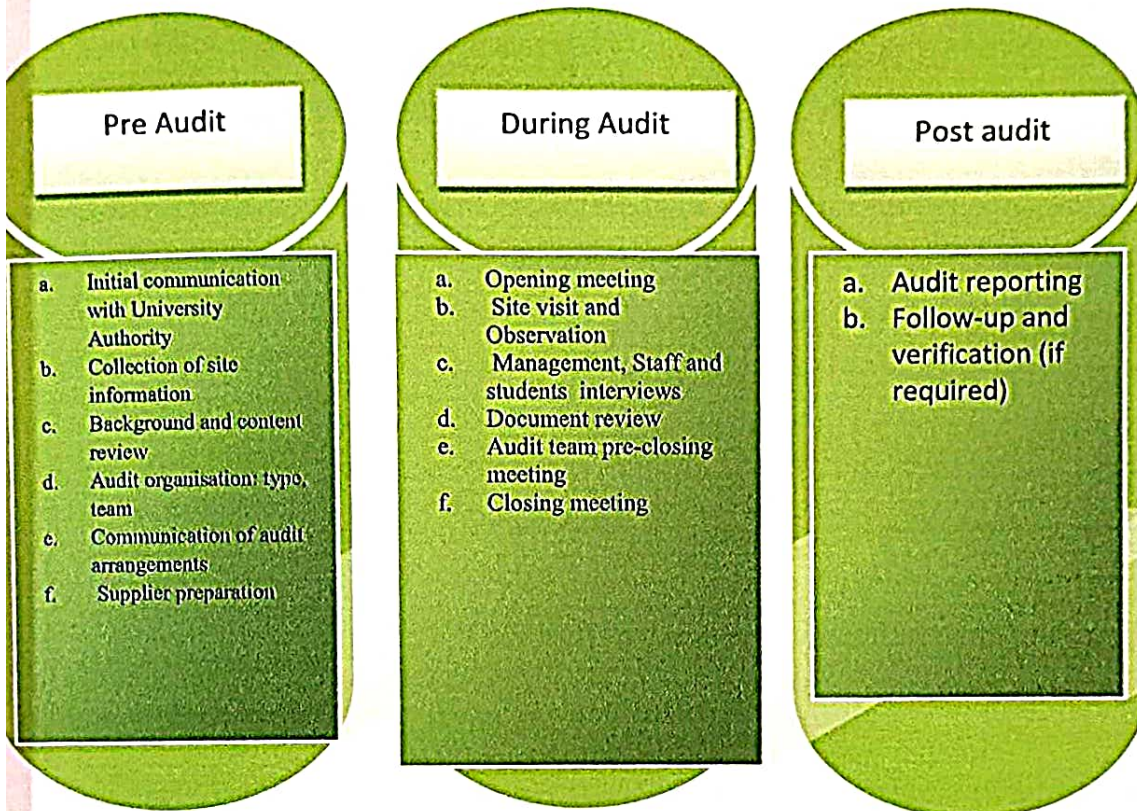
- To develop to more efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To promote plastic free campus and evolve health consciousness among the 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:

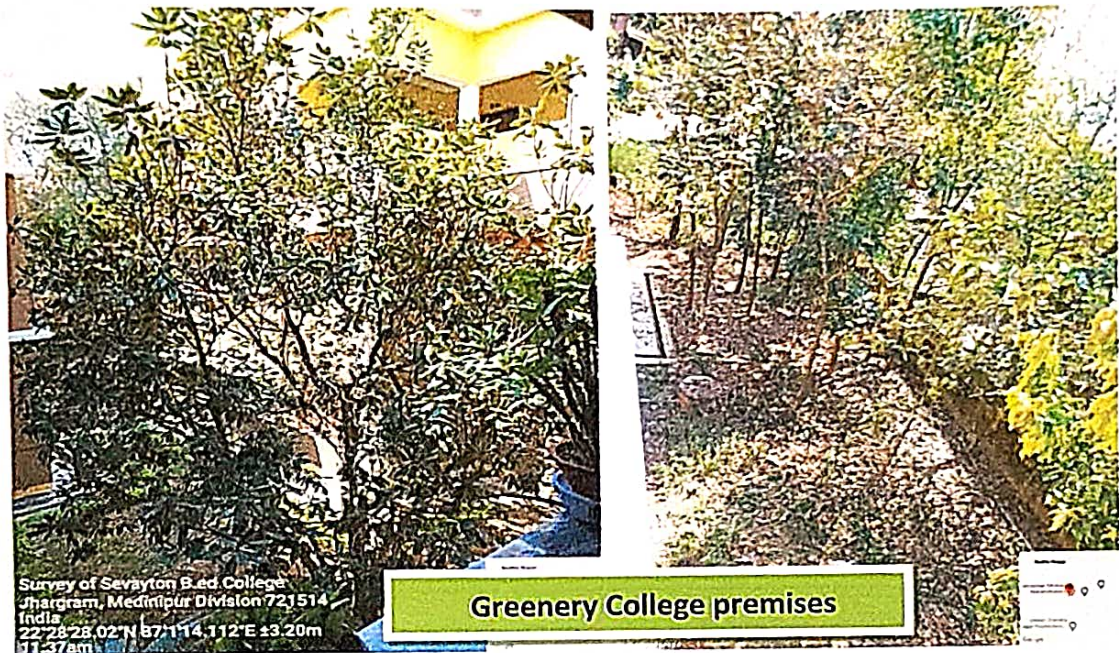
The methodology is adopted for this assessment by collecting the information by onsite visit, group discussion, campus survey, enquiry, observation. Perception study and opinion survey are also included in the Auditing Report.

#### Flow Chart of Methodology for Auditing



## 2.2 Site Visit:

1. College 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, hostels, library, All Department, office rooms, Hostels, 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, Library, hostels etc.
- Data collected by observation and interview.
- Assessment of the environmental condition through measurement

### 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 college 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 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.



Aquatic diversity and natural honey comb

### 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.

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.



Classroom observation

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 Produce and Waste Management
5. Biodiversity and Green Zone management

Table-2 Total population of the College

Students -	303	persons
Teaching, Non-teaching and Other Stakeholders	39	persons
<b>Total</b>	<b>342</b>	<b>persons</b>
<b>Approximate no of visitor (per day)-</b>	<b>08</b>	<b>persons</b>

#### 3.2 Water Efficiency and Water Management :

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 washroom in Hostels & Staff Quarter. About 27419 Litre water has been used per day.
b.	Lifting of water	About 30000 Litre water per day
c.	Water wastage	The leakage and misuse of water is about 400 Litre in whole campus. Small drip from a leaky tap, sewage water from pan in toilets and over flow can waste significant amount of water per day.
d.	Water recycle	Waste water recycle unit has installed in the institute for the gardening and other purpose, mainly rain water harvesting and ground water recharge & roof water harvesting unit is the innovative unit to reuse for the prevention of building fire. It is Unique water saving model for sustainable resource management.  One rain water harvesting system is available in College campus.

**Table-3 Use of water for Different Purpose of College Premises**

Use of water for Different Purpose Per Day	Use in Percentage
Bathing and washroom	36.55
Cooking and washing	21.88
Cleaning and gardening	21.88
Drinking	5.47
Others	12.76
Misuse of Water	1.46

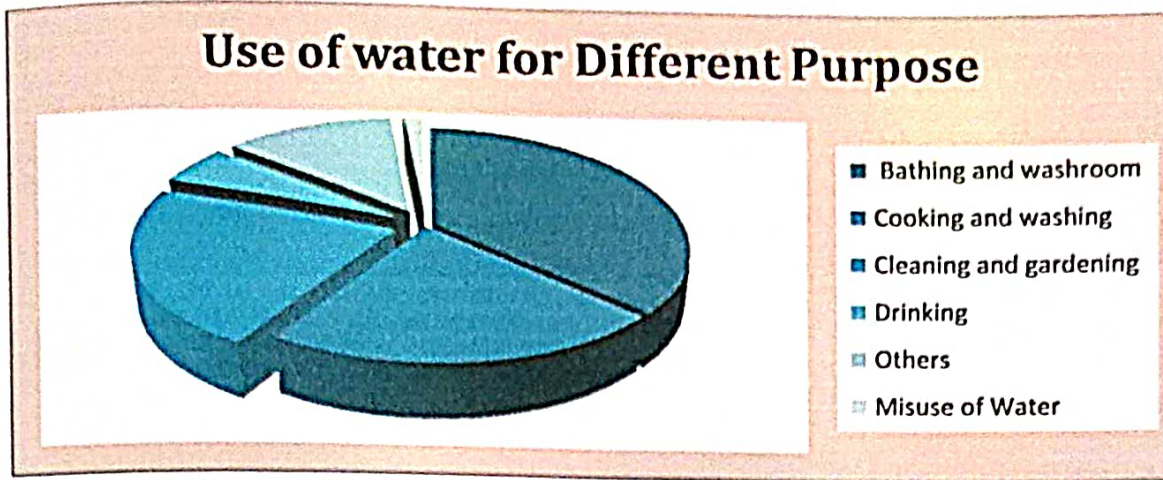


Fig.2 Use of water in Different Purpose Per Day

**Taken Water management policy**

Sl. No.	Factors	Weightage
1	Quality of Water	H
2	Re-use of water	H
3	Water Harvesting & Recharge	H
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%

**Observation and 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.

**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 24 W.
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b.	Energy consumption	The useable energy is Conventional and Non-Conventional energy(42204unit+11760unit). The used energy is 53964 units costing to Rs. 418221/. About 22% energy is Non-conventional energy contributed from Solar Power. The Maximum energy is consumed for Light & Fan amounting to 46% of total consumption. Departmental and Computer laboratory uses about 27% of total consumed energy.
c.	Usage of LPG	It has been observed that LPG gas cylinders are used in Canteen, & Laboratories (126PC/year) for cooking and other purpose. There are Green generators used in the premises.

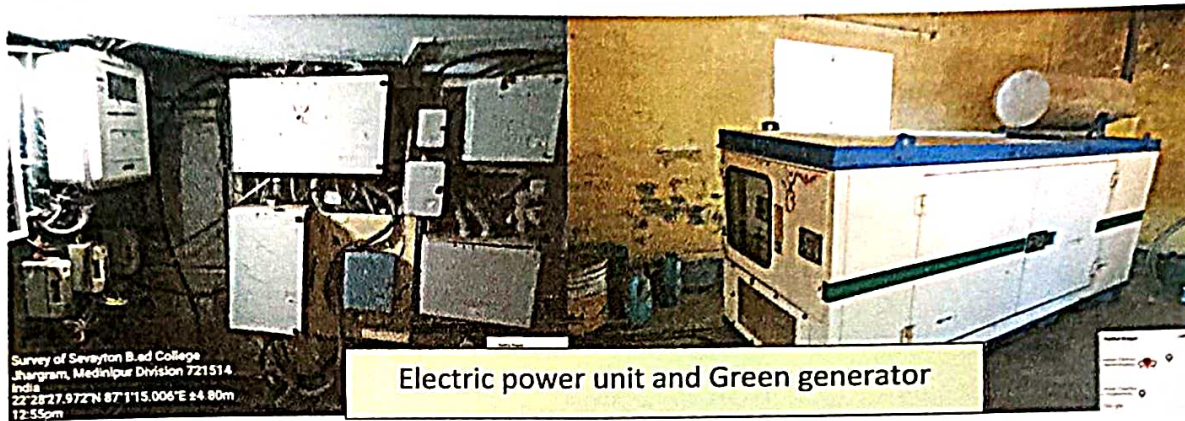


Table-4 Source of Energy in Percentage

Source of Energy	In Percentage
Conventional	78
Non -Conventional	22

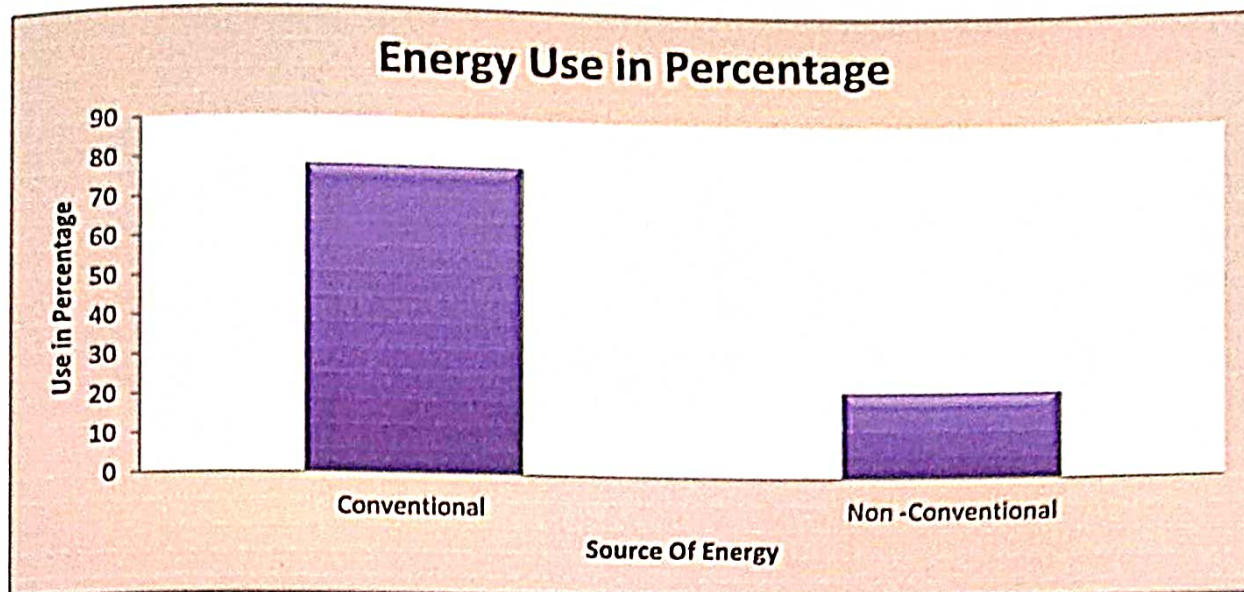


Fig. 3 Use of Energy in Percentage

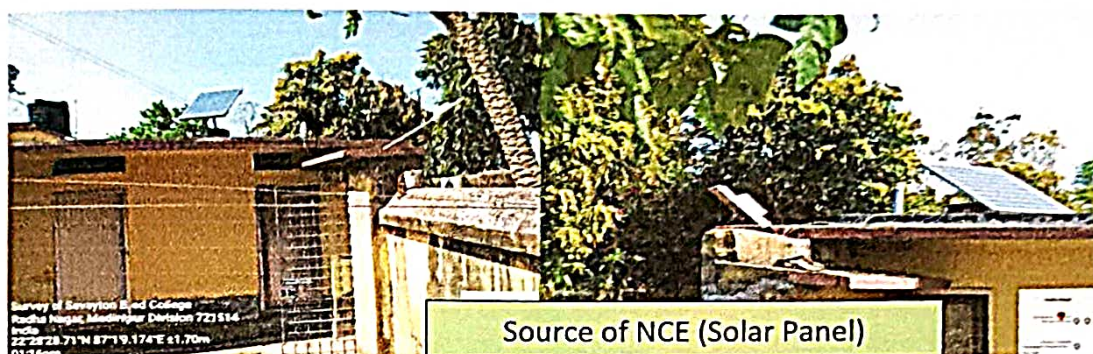


Table-5 Energy Consumption for different Purpose in Percentage

Energy Consumption for different Purpose	In Percentage
light and fans	46
AC	8
Pump	7
Computer and Laboratory	27
Others	12

### Percentage of Energy Consumption for different Purpose

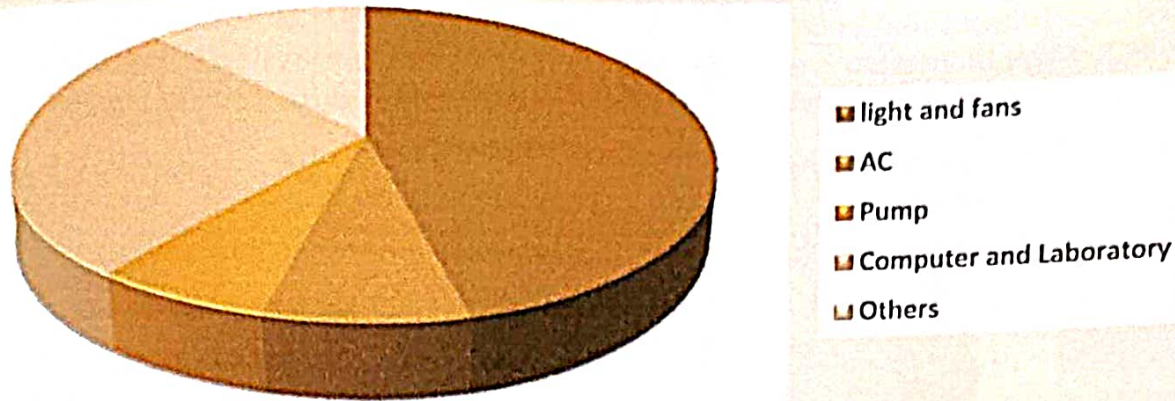


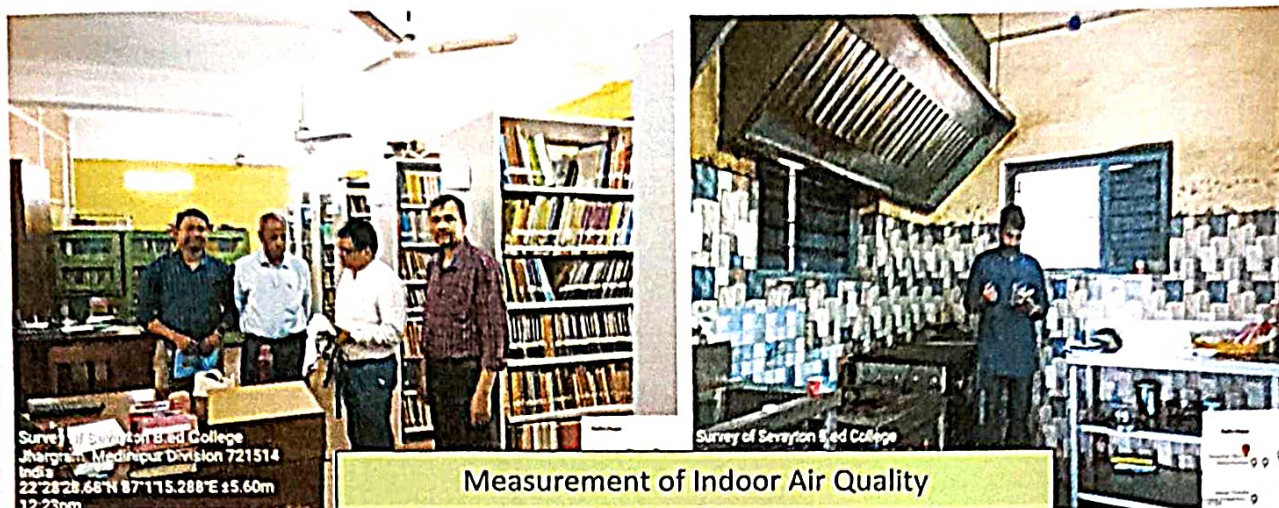
Fig. 4 Percentage of Energy Consumption in different Purpose

#### Observation and 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.

### 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 vapor, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the



most leading greenhouse gas, comprising about 214ppm (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 CO<sub>2</sub> (ppm) in different location of the College Campus

Different location of the College Premises	Amount of CO <sub>2</sub> (ppm)
Principal Office	430
Geography Lab	415
Computer Lab	450
Library	455
Cycle Stand	390
Play Ground	370
Canteen & Kitchen	430
Hostel	430

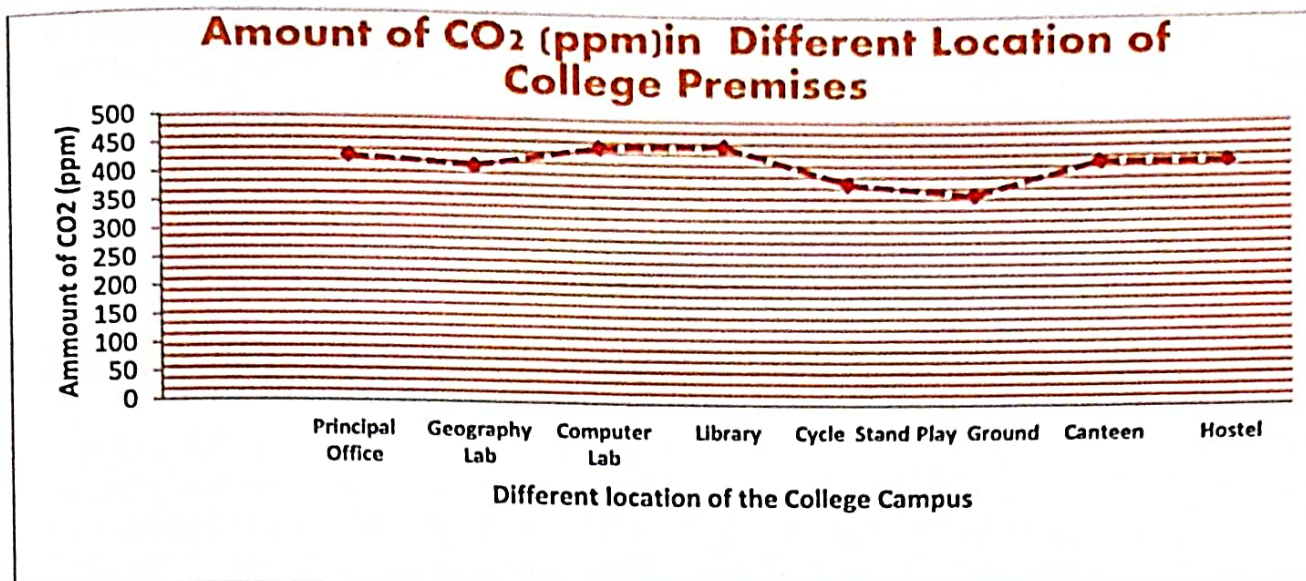


Fig. 5 Amount of CO<sub>2</sub> (ppm) in Different Location of the College Premises

Table-7 Amount of CO<sub>2</sub> ( ppm) in the air in different location, ( College Campus) session 2022-2023

Amount of CO <sub>2</sub> (ppm) in the Air in Different places of the College Premises	Amount of CO <sub>2</sub> (ppm)
Outdoor	392
Indoor (Class room)	420
Indoor (Laboratories)	430

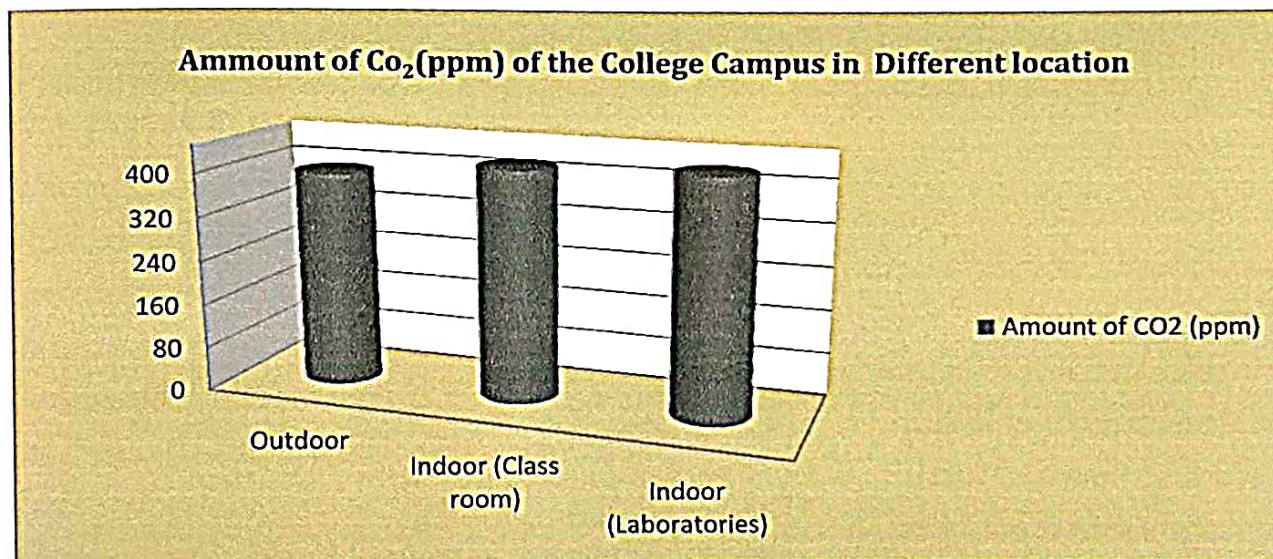


Fig. 6 Amount of Co<sub>2</sub>(ppm) of the Air in Different location of the College Premises

**Observation and 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) Basutirtha (Rainwater harvesting) innovative model may be followed in appropriate fashion.

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-8 Types of wastes

Type of Wastage	Amount in Kg
Degradable	75
Non degradable	5

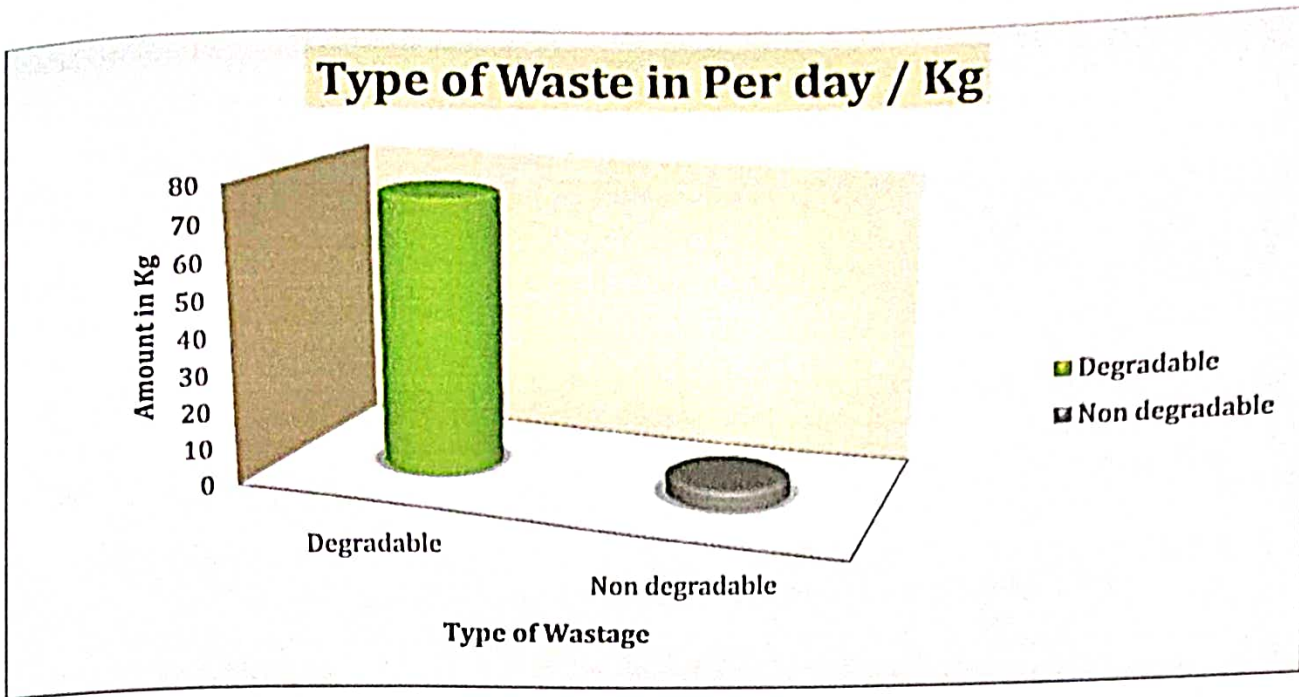
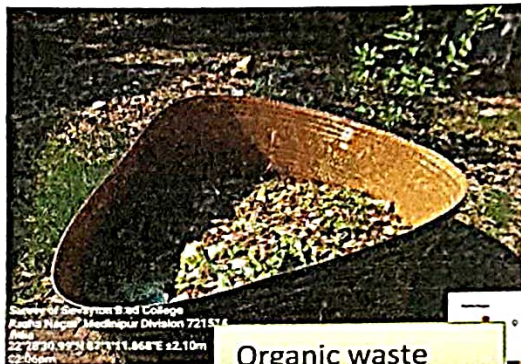


Fig. 7 Type and Amount of Waste

The following categories of wastes are generated in the College 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,



Organic waste



Paper waste



bacterial control, and natural control through plantation.

Table-9 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 Hostels	62	2
Office	2	1
Laboratories	1	0.5
Garden	9	0.5
Others	1	1

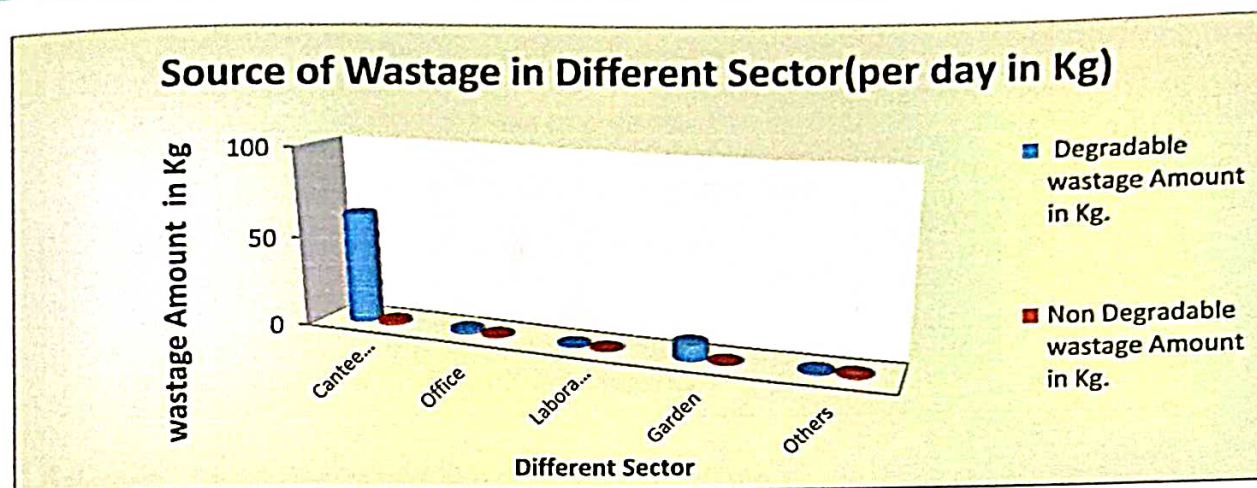


Fig. 8 Source and Amount of Wastage in Different Sector (per day in Kg)

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



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:

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	H
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%

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

### 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. 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



Green corridor

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.

About 38.3% area is under greenery and biodiversity zone 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 College campus premises is rich.

### Biodiversity Study

**Plant diversity** – The campus of Sevayatan Sikshan Mahavidyalaya is lush green and surrounded by large Sal (*Shorea robusta*) trees. Forest lands are covered by sal trees and other large trees like Mango, Mohua, Ashoke, Shisu, Krishna chura etc. One medicinal plant garden is situated southern part of the playground, which needed restoration. Small patches of plantation of different fruit yielding trees are found in front of ladies hostel, quarter and north & eastern side of playground. There was a kitchen garden also found in front of Boy's hostel and teachers quarters. The north side and south side of the administrative building are surrounded by large Sal, Neem (*Azadirachta indica*), Gulmohor (*Delonix regia*), Debdaru (*Polyalthia longifolia*), Simul (*Bombax ceiba*), etc. trees.

According to Champion and Seth, 1983, The forest surrounded by the Jhargram is Dry Deciduous Sal Forest. The campus is representing such forest type. For quick ecological and vegetation study, Transact and quadrat methods are taken. Here length of transact was 30m. The plant diversity study has been done through quadrat method. One set of quadrats has been laid in the main campus. For this purpose a standard method has been followed i.e. 10m x 10m for trees, 5m x 5m for shrubs and 1m x 1m for herbs. It has been found from the study that there are approximately 40 tree species, 45 shrubs, 55 herbs and three species of gymnosperm. The dominant species are Sal and Mango here. Sal associates are *Croton oblongifolia*, *Combretum roxburghii* are available here like a natural forest.

There is one medicinal plant garden within the college campus. Beside this there are 25 plants with medicinal value. Plants like *Hemidesmus indicus*, *Adhatoda vasica*, *Aloe vera*, *Aristolochia indica*, *Asparagus racemosus*, *Cissus quadrangularis*, *Curcuma caesia* etc. are

planted. A small kitchen garden is observed at the quarter's front side. Different seasonal varieties of vegetable plants are found. Plants like *Alocasia esculanta*, *Basella rubra*, *Capsicum annuum*, *Solanum melongena* etc. are planted

A fruit yielding plantation area found surrounding the ladies hostel and teachers quarters also surrounding. There are 20 different species of fruit plants. Species like *Aegle marmelos*, *Annona squamosa*, *Artocarpus heterophylla*, *Averrhoa carambola*, *Carica papaya*, *Dillenia indica*, *Grewia asiatica* etc. are planted. There are small surrounded areas for plantation of ornamental or flowering plants. Seasonal flowering plants are planted here. Plants like *Tectona grandis*, *Canna indica*, *Duranta repens*, *Euphorbia milii*, *Tagetes spatula* etc. are available now.

From Quadrat study two girth classes of trees are calculated. From this data Carbon sequestration potential of trees have been calculated.

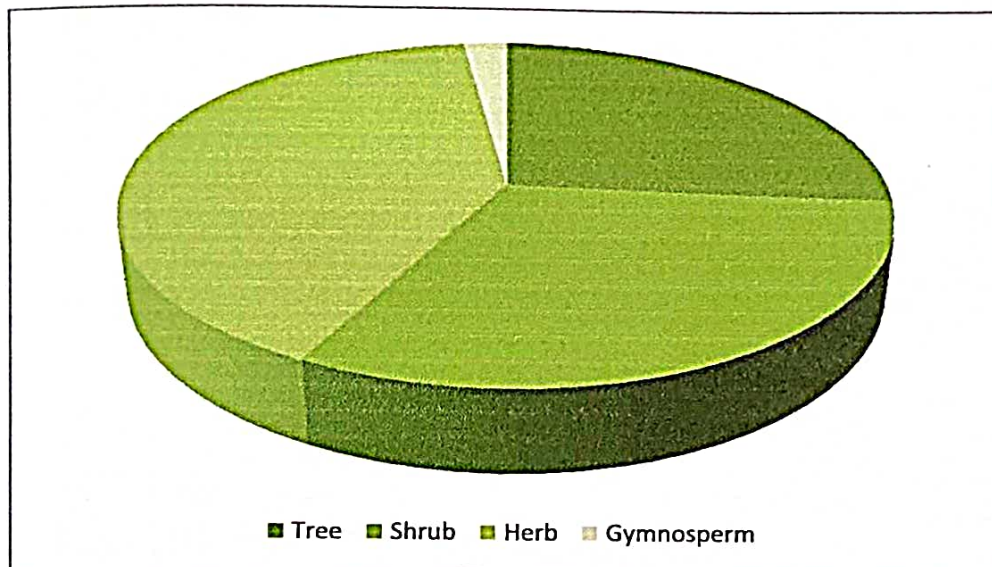


Fig.: Composition of different types of plants

Table -1a: Available Common Tree species in the college campus and surrounding area

Sl. No.	Scientific name	Family
1	<i>Albizia lebbbeck</i> (L.) Benth.	Fabaceae
2	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae
3	<i>Araucaria araucana</i> (Molina) K.Koch	Araucariaceae
4	<i>Artocarpus heterophyllus</i> Lam.	Moraceae
5	<i>Azadirachta indica</i> A.Juss.	Meliaceae
6	<i>Bombax ceiba</i> L.	Malvaceae
7	<i>Callistemon viminalis</i> (Sol. Ex Gaertn.) G.Don	Myrtaceae
8	<i>Carissa carandas</i> L.	Apocynaceae
9	<i>Casuarina equisetifolia</i> L.	Casuarinaceae
10	<i>Dalbergia sissoo</i> DC.	Fabaceae
11	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae
12	<i>Eucalyptus globules</i> Labill.	Myrtaceae
13	<i>Gmelina arborea</i> Roxb.	Lamiaceae
14	<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae
15	<i>Magnolia champaca</i> L.	Magnoliaceae
16	<i>Malvastrum sp</i>	Malvaceae
17	<i>Mangifera indica</i> L.	Anacardaceae
18	<i>Mimusops elengi</i> L	Sapotaceae
19	<i>Murraya paniculata</i> (L.) Jack	Rutaceae
20	<i>Nerium indicum</i> Mill.	Apocynaceae
21	<i>Peltophorum pterocarpum</i> (DC.) K.Heyne	Fabaceae
22	<i>Phoenix dactylifera</i> L.	Aracaceae
23	<i>Phoenix roebelenii</i> O'Brien	Aracaceae
24	<i>Psidium guajava</i> L.	Myrtaceae
25	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae
26	<i>Roystonea regia</i>	Arecaceae
27	<i>Santalum album</i> L.	Santalaceae
28	<i>Shorea robusta</i> Gaertn. f.	Dipterocarpaceae
29	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae
30	<i>Tecoma gaudichaudii</i> DC	Bignoniaceae
31	<i>Tectona grandis</i> L.f.	Lamiaceae
32	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae
33	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Combretaceae
34	<i>Terminalia chebula</i>	Combrataceae

35	<i>Thevetia peruviana</i> (pers.) Merrill	Apocynaceae
36	<i>Thuja orientalis</i> L.	Cupressaceae
37	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae

Table -1b: Available common plants species in the college campus and surrounding area

Sl. No.	Scientific name	Family
1	<i>Agave angustifolia</i> Haw.	Asparagaceae
2	<i>Agave sisalana</i> Perrine	Asparagaceae
3	<i>Aristolochia indica</i> L.	Aristolochiaceae
4	<i>Asparagus racemosus</i> Willd.	Asparagaceae
5	<i>Asparagus setaceus</i> (Kunth) Jessop	Asparagaceae
6	<i>Bougainvillea glabra</i> Comm. Ex Juss	Nyctaginaceae
7	<i>Caladium bicolor</i> (Aiton) Vent.	Araceae
8	<i>Calotropis procera</i> (Aiton) Dryand.	Asclepiadaceae
9	<i>Calotropis gigantea</i> (L.) Dryand.	Apocynaceae
10	<i>Canna indica</i> L.	Cannaceae
11	<i>Cissus quadrangularis</i> L.	Vitaceae
12	<i>Citrus limetta</i> Risso	Rutaceae
13	<i>Clerodendrum indicum</i> (L.) Kuntze	Lamiaceae
14	<i>Croton oblongifolia</i>	Euphorbiaceae
15	<i>Datura stramonium</i> L.	Solanaceae
16	<i>Datura suaveolens</i> f. <i>albidoflava</i> (Lem.) Voss	Solanaceae
17	<i>Dracaena reflexa</i> Lam.	Asparagaceae
18	<i>Duranta erecta</i> L.	Verbenaceae
19	<i>Eupatorium odoratum</i> L.	Asteraceae
20	<i>Euphorbia milii</i> Des Moul.	Euphorbiaceae
21	<i>Holarrhena antidysenterica</i> (L.) Wall.	Apocynaceae
22	<i>Hydrocotyle sibthorpioides</i> Lam.	Araliaceae
23	<i>Ixora coccinea</i> L.	Rubiaceae
24	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae
25	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae
26	<i>Lantana camara</i> L.	Verbenaceae
27	<i>Mentha spicata</i> L.	Lamiaceae
28	<i>Mikania scandens</i> (L.) Wild.	Asteraceae
29	<i>Mimosa pudica</i> L.	Fabaceae
30	<i>Mirabilis jalapa</i> L.	Nyctaginaceae
31	<i>Mussaenda erythrophylla</i> Schumach. &	Rubiaceae

	Thonn.	
32	<i>Ocimum canum</i> Sims.	Lamiaceae
33	<i>Ocimum sanctum</i> L.	Lamiaceae
34	<i>Opuntia dillenii</i> (Ker Gawl.) Haw.	Cactaceae
35	<i>Pedilanthus tithymaloides</i> (L.) Poit.	Euphorbiaceae
36	<i>Pteris vittata</i> L.	Pteridaceae
37	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae
38	<i>Sansevieria cylindrica</i> Bojer ex Hook.	Asparagaceae
39	<i>Sansevieria roxburghiana</i> Schult. & Schult.f.	Asparagaceae
40	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae
41	<i>Thunbergia mysorensis</i> (Wight) T.Anderson	Acanthaceae
42	<i>Tradescantia pallida</i> (Rose) D.R. Hunt	Commelinaceae
43	<i>Tylophora indica</i> (Burm. f.) Merr.	Apocynaceae
44	<i>Vanda roxburghii</i> R.Br.	Orchidaceae

Table -1c: Available Herb species within the college campus

Sl. No.	Scientific name	Family
1	<i>Acalypha indica</i> L.	Euphorbiaceae
2	<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae
3	<i>Aerva sanguinolenta</i> (L.) Blume	Amaranthaceae
4	<i>Ageratum conyzoides</i> L.	convolvulaceae
5	<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae
6	<i>Alternanthera sessilis</i> (L.)R.Br.ex DC.	Amaranthaceae
7	<i>Bambusa spinosa</i> Roxb.	Poaceae
8	<i>Barleria lupulina</i> Lindl.	Acanthaceae
9	<i>Begonia rex</i> Putz.	Begoniaceae
10	<i>Belamcanda chinensis</i> (L.) DC.	Iridaceae
11	<i>Boerhavia diffusa</i> L.	Nyctaginaceae
12	<i>Chrysopogon zizanioides</i> (L.) Roberty	Poaceae
13	<i>Codiaeum variegatum</i> (L.) Rumph. ex A.Juss.	Euphorbiaceae
14	<i>Coleus blumei</i> Benth.	Lamiaceae
15	<i>Coleus forskohlii</i> (Willd.) Briq.	Lamiaceae
16	<i>Cordyline fruticosa</i> (L.) A.Chev.	Asparagaceae
17	<i>Cordyline terminalis</i> (L.) Kunth	Asparagaceae
18	<i>Crinum latifolium</i> L.	Amaryllidaceae
19	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae
20	<i>Cymbopogon nardus</i> (L.) Rendle	Poaceae

21	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae
22	<i>Desmodium gangeticum</i> DC.	Fabaceae
23	<i>Desmodium triflorum</i> (L.) DC.	Fabaceae
24	<i>Dypsis lutescens</i> (H.Wendl.) Beentje & J.Dransf.	Aracaceae
25	<i>Ecballium ligustrinum</i> (Vahl) Vollesen	Acanthaceae
26	<i>Eleutheranthera ruderalis</i> (Sw.) Sch.Bip.	Asteraceae
27	<i>Eragrostis tenella</i> (L.) Roem. & Schult.	Poaceae
28	<i>Euphorbia hirta</i> L.	Euphorbiaceae
29	<i>Euphorbia heterophylla</i> L.	Euphorbiaceae
30	<i>Grevillea robusta</i> A.Cunn. ex R.Br.	Proteaceae
31	<i>Hedychium coronarium</i> J.Koenig	Zingiberaceae
32	<i>Hippeastrum reginae</i> (L.) Herb.	Amaryllidaceae
33	<i>Kopsia fruticosa</i> (Roxb.) A.DC.	Apocynaceae
34	<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae
35	<i>Oldenlandia corymbosa</i> L.	Rubiaceae
36	<i>Oplismenus hirtellus</i> (L.) P.Beauv	Poaceae
37	<i>Phyllanthus niruri</i>	Euphorbiaceae
38	<i>Piper betle</i> L.	Piperaceae
39	<i>Piper retrofractum</i> Vahl	Piperaceae
40	<i>Plumeria pudica</i> Jacq.	Apocynaceae
41	<i>Polyalthia longifolia</i> Sonn	Annonaceae
42	<i>Polyscias balfouriana</i> (André) L.H.Bailey	Araliaceae
43	<i>Portulaca grandiflora</i> Hook.	Portulacaceae
44	<i>Premna mollissima</i> Roth	Lamiaceae
45	<i>Rhinacanthus nasutus</i> (L.) Kurz	Acanthaceae
46	<i>Rhoeo discolor</i> (L'Hér.) Hance	Commelinaceae
47	<i>Scoparia dulcis</i> (L.) Kuntze.	Scrophulariaceae
48	<i>Sida cordifolia</i> L.	Malvaceae
49	<i>Solanum nigrum</i> L.	Solanaceae
50	<i>Solanum sisymbriifolium</i> Lam.	Solanaceae
51	<i>Spermacoce hispida</i> L.	Rubiaceae
52	<i>Stevia rebaudiana</i> (Bertoni) Bertoni	Asteraceae
53	<i>Syngonium podophyllum</i> Schott	Aracaceae
54	<i>Talinum portulacifolium</i> (Forssk.) Asch. ex Schweinf.	Talinaceae
55	<i>Tridax procumbens</i> (L.) L.	Asteraceae
56	<i>Urtica</i> sp	Asteraceae
57	<i>Vernonia cinerea</i>	Lamiaceae

Table -1d: Available Gymnosperm species within the college campus

Sl. No.	Scientific name	Family
1	<i>Cycas revoluta</i> Thub.	Cycadaceae
2	<i>Zamia furfuracea</i> L.f.	Zamiaceae
3	<i>Thuja orientalis</i>	Cupressaceae

Table – 2: List of Medicinal plants of Garden

Sl. No.	Local Name	Scientific Name	Family
1	Basak	<i>Adhatoda vasica</i> (Nees.)	Acanthaceae
2	Apang	<i>Aerva sanguinolenta</i> (L.) Blume	Amaranthaceae
3	Ghritakumari	<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae
4	Iswarmul	<i>Aristolochia indica</i> L.	Aristolochiaceae
5	Satamul	<i>Asparagus racemosus</i> Willd.	Asperagaceae
6	Bisalyakarani	<i>Barleria lupulina</i> Lindl.	Acantaceae
7	Lily	<i>Belamcanda chinensis</i> (L.) DC.	Iridaceae
8	Harjora	<i>Cissus quadrangularis</i> L.	Vitaceae
9	Ghentu	<i>Clerodendrum indicum</i> (L.) Kuntze	Verbenaceae
10		<i>Coleus blumei</i> Benth.	Lamiaceae
11	Kalo Halud	<i>Curcuma caesia</i> Roxb.	Zingiberaceae
12	Lemon grass	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae
13	Citronella	<i>Cymbopogon nardus</i> (L.) Rendle	Poaceae
14	White Zinger	<i>Hedychium coronarium</i> J. Koenig.	Zingiberaceae

15	Anantamul	<i>Hemidesmus indicus</i> (L.) R.Br.	Asclepiadaceae
16	Patharkuchi	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae
17	Pan	<i>Piper betle</i> L.	Piperaceae
18	Choi jhal	<i>Piper chaba</i> Trel. &Yunck.	Piperaceae
19	Golmorich	<i>Piper longum</i> L.	Piperaceae
20	Sarpagandha	<i>Rauwolfia serpentina</i> (L.) Benth. Ex. Kurz	Apocynaceae
21	Star goosberry	<i>Sauropus androgynus</i> (L.) Merr.	Phyllanthaceae
22	Arjun	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight &Arn.	Combretaceae
23	Antamul	<i>Tylophora indica</i> (Burm. f.) Merr.	Asclepiadaceae

Table – 3: List of fruit plants present in the campus

Sl. No.	Scientific name	Common name	Family
1	<i>Aegle marmelos</i>	Bel	Rutaceae
2	<i>Annona squamosa</i>	Ata	Annonaceae
3	<i>Artocarpus heterophylla</i>	Jack Fruit	Moraceae
4	<i>Averrhoa carambola</i>	Kamranga	Oxalidaceae
5	<i>Bassia latifolia</i>	Mahua	Sapotaceae
6	<i>Carica papaya</i>	Pepe	Caricaceae
7	<i>Citrus decumana.</i>	Batabilabu	Rutaceae
8	<i>Dillenia indica</i>	Chalta	Dilleniaceae
9	<i>Eugenia jambolana</i>	Kalojam	Myrtaceae

10	<i>Grewia asiatica</i>	Falsa	Tiliaceae
11	<i>Mangifera indica</i>	Aam	Anacardiaceae
12	<i>Mimusops elengii</i>	Bakul	Sapotaceae
13	<i>Moringa Oleifera</i>	Sajne	Moraginaceae
14	<i>Morus nigra</i>	Tunt	Moraceae
15	<i>Psidium guava</i>	Piara	Myrtaceae
16	<i>Schleichera oleosa</i>	Kusum	Sapindaceae
17	<i>Spondias dulcis</i>	Bilati Amra	Anacardiaceae
18	<i>Syzygium samarangense</i>	Jamrul	Myrtaceae
19	<i>Tamarindus indica</i>	Tetul	Casapiniaceae
20	<i>Zizyphus mauritiana</i>	Kul	Rhamnaceae

Table - 4: List of Plants of kitchen garden

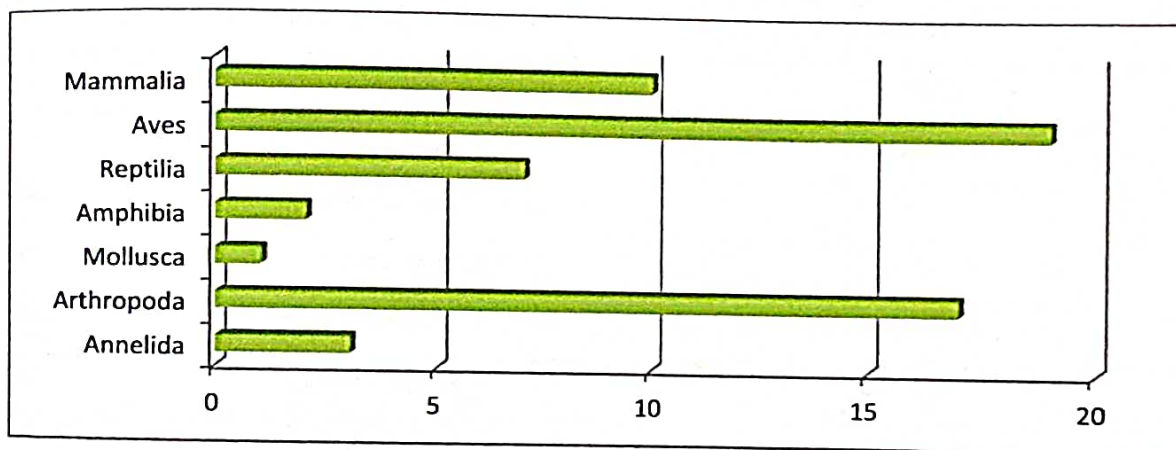
Sl. No.	Scientific name	Local name	Family
1	<i>Alocasia esculanta</i>	Cochu	Araceae
2	<i>Basella rubra</i>	Pui	Basellaceae
3	<i>Capsicum annum</i>	Lanka	Solanaceae
4	<i>Carica papaya</i>	Papaya	Caricaceae
5	<i>Cinamomum tamala</i>	Tejpata	Lauraceae
6	<i>Lycopersicum esculantum</i>	Tomato	Solanaceae
7	<i>Piper chaba</i>	Choi jhal	Piperaceae
8	<i>Solanum melongena</i>	Begun	Solanaceae

Table-5: Ornamental Plants found in the college campus

Sl. No.	Scientific Name	Family
1	<i>Aurocaria heterophylla</i>	Araucariaceae
2	<i>Cycas revolute</i>	Cycadaceae
3	<i>Murraya paniculata</i>	Rutaceae
4	<i>Roystonea regia</i>	Arecaceae
5	<i>Tabernemontana coronaria</i>	Apocynaceae
6	<i>Tectona grandis</i> L.f.	Lamiaceae
7	<i>Thuja orientalis</i>	Cupressaceae
8	<i>Zamia furfuracea</i> L.f.	Zamiaceae
9	<i>Adenium sp.</i>	Apocynaceae
10	<i>Agave Americana</i>	Asparagaceae
11	<i>Canna indica</i>	Cannaceae
12	<i>Duranta repens</i>	Verbenaceae
13	<i>Euphorbia milii</i>	Euphorbiaceae
14	<i>Hibiscus rosasinensis</i>	Malvaceae
15	<i>Rosa sp.</i>	Rosaceae
16	<i>Tagetes sp.</i>	Asteraceae

**Faunal Diversity:** College campus is a habitat of a number of wide varieties of fauna. Different types of insects including moths, butterfly, wasp, bees, amphibian, reptilian, birds and mammals are found here. The large abandoned area of the college is creating a great habitat of different mammals also. This area is safe for animals. Members of different phylum are given in figure .

Fig.-: Comparison between different animal members of different phylum found in the campus



**Phylum: Annelida**

Sl. No.	Scientific name	Local name
1.	<i>Hirudinaria sp</i>	Joke
2.	<i>Pheretima sp.</i>	Kecho

**Phylum: Arthropoda**

Sl. No.	Scientific name	Local name
1	<i>Anopheles sp</i>	Anopilis masa
2	<i>Apis sp</i>	Moumachi
3	<i>Buthus sp</i>	Kakrabicha
4	<i>Copris lunaris</i>	Gubrepoka
5	<i>Galleria sp</i>	Moth
6	<i>Julus sp</i>	Kenno
7	<i>Lampyri snoctiluca</i>	Jonaki
8	<i>Muska domestica</i>	Machi
9	<i>Nephila sp</i>	Makarsa
10	<i>Odontotermes sp</i>	Wepoka
11	<i>Oecophyllas maragdina</i>	Lalpipra
12	<i>Orthetrum sp</i>	Pharing
13	<i>Papilio sp</i>	Prajapati
14	<i>Periplaneta americana</i>	Arsola
15	<i>Schistocera gregaria</i>	Pangapal
16	<i>Scolopendra sp</i>	Tetulbicha
17	<i>Vespa orientalis</i>	Vimrul

Phylum: Mollusca

Sl. No.	Scientific name	Local name
1	<i>Acatina fulica</i>	Sthal samuk

Class : Amphibia

Sl. No.	Scientific name	Local name
1	<i>Duttaphrynusmelano stictus</i>	Kuno bang
2	<i>Rana tigrina</i>	Sona bang

Class: Reptilia

Sl. No.	Scientific name	Local name
1	<i>Ahaetullana sutas</i>	Loudaga sap
2	<i>Calottes versicolor</i>	Girgiti
3	<i>Daboia russelii</i>	Chandrabora sap
4	<i>Elachistodon westermanni</i>	Matiali sap
5	<i>Hemidactylus flaviviridis</i>	Tiktiki
6	<i>Ptyas mucosus</i>	Jamna sap
7	<i>Varanus sp</i>	Godi sap

Class : Aves

Sl. No.	Scientific name	Local name
1	<i>Acridotheres tristis</i>	Shalik
2	<i>Alcedo atthis</i>	Chotomachranga
3	<i>Amaurornis phoeniurus</i>	Dahuk
4	<i>Ardeola grayii</i>	Bak
5	<i>Athene brama</i>	Kuturepancha
6	<i>Columba livia</i>	Paira
7	<i>Copsychuss aularis</i>	Doyel

8	<i>Corvus splendens</i>	Kak
9	<i>Dicrurous adsimilis</i>	Phinge
10	<i>Dinopium bengalensis</i>	Kat thokra
11	<i>Eudynamis scolopacea</i>	Kokil
12	<i>Merops orientalis</i>	Baspati
13	<i>Orthotomus</i>	Tuntuni
14	<i>Passer domesticus</i>	Charaipakhi
15	<i>Pittacula sp</i>	Tia
16	<i>Pycnonotus sp</i>	Bulbul
17	<i>Streptopelia chinensis</i>	Gughu
18	<i>Turdoides udatus</i>	Satbhaya
19	<i>Tyto alba</i>	Lakshmi pancha

**Class : Mammalia**

Sl. No.	Scientific name	Local name
1	<i>Bandicota bengalensis</i>	Indur
2	<i>Felis chaus</i>	Katas
3	<i>Funambulus pennanti</i>	Katbirali
4	<i>Herpestes edwardsii</i>	Neul
5	<i>Mus musculus</i>	Nenhtiindur
6	<i>Pipistrellus tenuis</i>	Chamchika
7	<i>Prionailurus viverrinus</i>	Mechobiral
8	<i>Pteropus sp</i>	Badhur
9	<i>Suncus murinus</i>	Chucha
10	<i>Vulpes bengalensis</i>	Khaksial

Table-10 Green Coverage of the College Premises

Green Coverage of the College Premises	Area in Percentage
Native and Natural Vegetation	22
Plantation	18
Agro-Plants	42
Medicinal Plants	12
Kitchen Garden	6

### Green Coverage of the College Premises

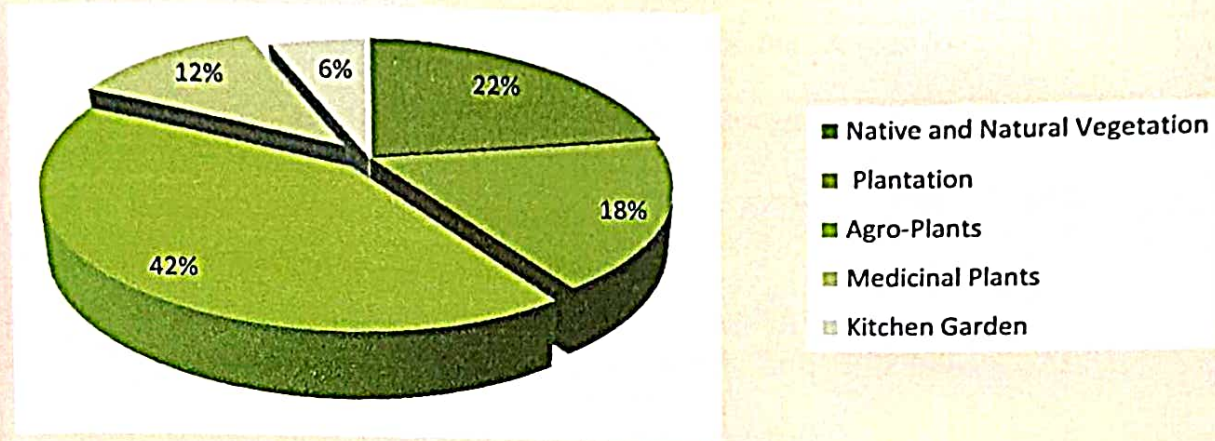


Fig. 9 Green Coverage of the College Premises

Table-11 : 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>Pycnonotusjocosus</i>	LC
2	Red Vented Bulbul	Bulbul	<i>Pycnonotuscafer</i>	LC
3	House Sparrow	ChotiCharai	<i>Passer domesticus</i>	LC
4	Eurasian Collared Dove	Par ghughu	<i>Streptopelia decaocto</i>	LC
5	Oriental Turtle Dove		<i>Streptopalia orientalis</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
10	House Crow	Kak	<i>Corvussplendens</i>	LC
11	Jungle Babbler	Chhatare/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-12 The Mammalian checklist is as follows-

SL. NO	COMMONNAME	BENGALINAME	SCIENTIFICNAME	IUCN RED LIST
1	FivestripedPal m Squirrel	Kath Berali	<i>Funambuluspennantii</i>	Least Concern (LC)
2	Free-ranging Cat	Biral	<i>Felisdomesticus</i>	DD
3	Free-ranging Dog	Kukur	<i>Canisfamiliaris</i>	DD
4	Asian Palm Civet	Bham	<i>Paradoxurushermaphroditus</i>	LC
5	Field Rat	MethoIndur	<i>Bandicotabengalensis</i>	LC
6	Grey Mongoose	Beji	<i>Herpestesedwardsii</i>	LC

7	House Mouse	NengtiIndur	<i>Musmusculus</i>	LC
8	Small Indian Civet	Kotas	<i>Viverriculaindlca</i>	LC
9	Bengal Fox	Fox	<i>Vulpesbengalensis</i>	LC
10	Indian gray mongoose	Neul	<i>Herpestesedwardsii</i>	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	H
4	Fishes and Amphibian	L
5	Fungus & 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:

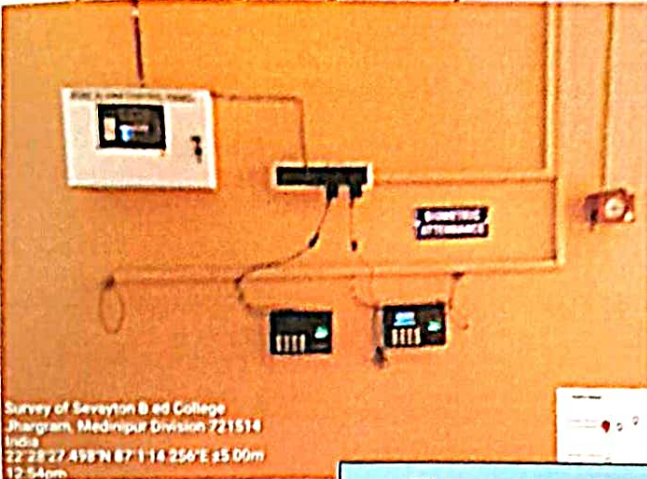
Documents such as admission registers, registers of Engineering and water charge remittance, furniture register, laboratory equipment registers, purchase register, audited statements, and office registers were examined and data were collected. College calendars, college magazines, annual report of the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

### 3.8 Review of Policies:

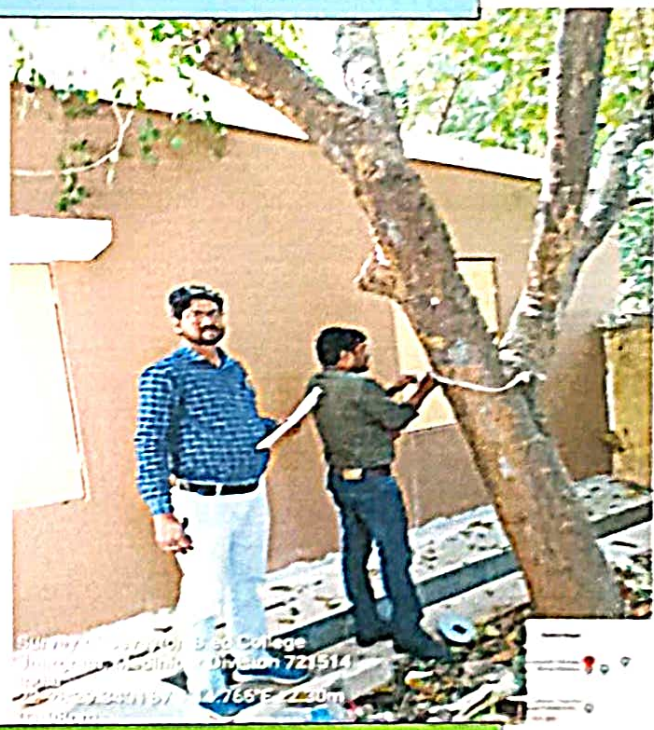
Discussions were made with the College management regarding their policies on environmental management. Future plans of the College were also discussed. The management would formulate a revised environment /green policy for the college in the light of green auditing. The purpose of the green audit was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

### 3.9 Interviews:

In order to collect information for green auditing different audit groups which are IQAC Cell, Dept. HOD, Teaching and non-teaching staff, students, Students Union, parents and other stakeholders of the College. Discussions were also made with the office bearers to clarify doubts regarding certain points.



Observation of Water harvesting & Recycle unit



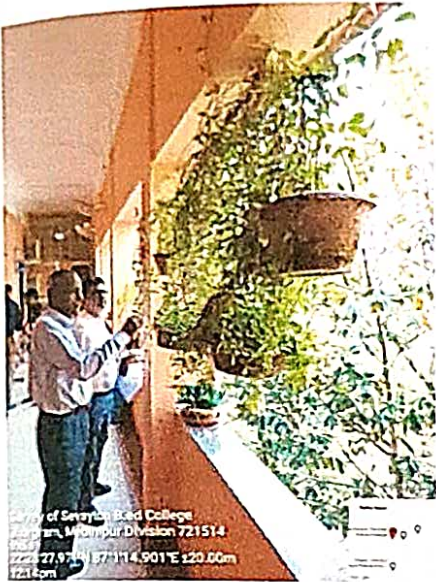
Plant Diversity Counting and Species Observation

## 4.0 POST AUDIT STAGE :

### 4.1. Data Analysis and Assessment :

The base of any Green audit and Environmental 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.

Although Green & Environmental audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. Each of the three components is crucial in ensuring that the organization's environmental performance meets the goals set in its green policy. The individual

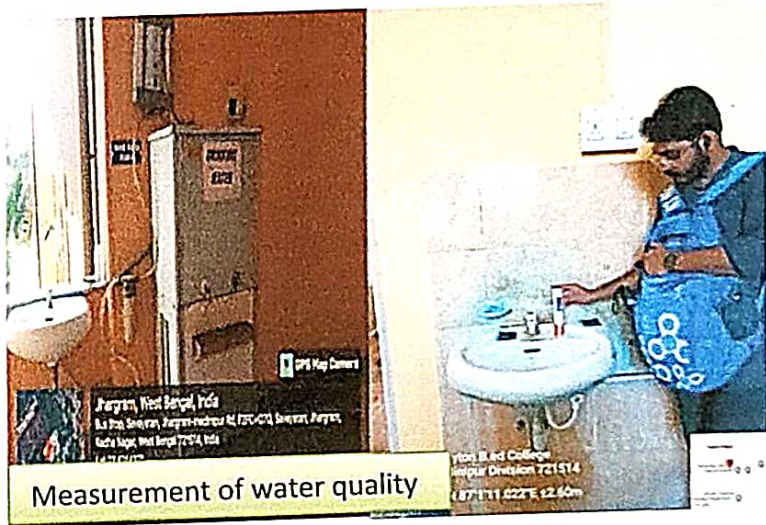


functioning and the success of integration will all play a role in the degree of success or failure of the organization's environmental performance.

## 4.2 Results and Findings:

### a) Water - Water Audit and Assessment

Sl. No.	Object and Parameter	Observation and Finding
1	Source of water	➤ Underground( 30000 liter)
2	Capacity of water storage (Daily)	➤ Reservoir and Overhead tanks- 30000 liter ➤ Total amount of used & misused water- 27419ltr ➤ Total misuse of water-400 ltr
3	Amount of used water per day	27019liter
4	Misuse of water in daily	Leakage, overflow and Misuse-400 liter
5	Maximum used of water per day - for Bathing and washroom purpose	36.55% ( 10019 liter)
6	Amount of water for used per day- Drinking Purpose	5.47 % (1500liter)
7	Number of Rain Water Harvesting unit	one
8	Installation of water reuse & Recycle units	one
9	pH level of drinking water	7-7.2
10	TDS level of drinking water	110ppm -125ppm



## b. Energy

- ❖ Electricity Consumption - 53964 Unit, Rs.- 418221/- Per Year
  - a) Conventional energy- 42204 Unit
  - b) Nonconventional energy-11760 Unit Less-Rs.91140/ .Rs. for Paid-Rs.-327081/
- ❖ Fossil fuel consumption per Year:
  - a. Number of Gas cylinders used for cooking purpose( Hostels& Canteen) – 126 PC
  - b. Number of Gas cylinders used in Chemistry Laboratory - 02 PC
  - c. Diesel used for green Generator- 90 liter
- ❖ Number of Green Generators - 02
- ❖ Cost of generator fuel – Rs. 8100 /month

### Energy Audit and Assessment

Sl. No.	Object and Parameter	Observation and Finding
1	Source of energy ( conventional)	78 %
2	Source of energy ( Non-conventional)	Solar- 22 %
3	Total consumption of Electric Power	53964 unit
4	The maximum use of conventional Electric Power	42204 unit
5	Maximum energy consumption in the purpose	Light and fans - 24823 Unit/year
6	Energy Consumption in Computer & Lab.	14570.28 unit /year
7	No. of LPG Gas cylinder for cooking purpose	126PC/ Year
8	No. of LPG Gas cylinder used in Laboratories	02pc/Year
9	Amount of diesel used for green generator	90 liter/Year
10	No. of AC and use of energy	4317.12 Kwh/year

### Energy consumption for different purpose, 2022-23

1.	Lights & Fans	24823unit
2.	Air Condition	4317.12unit
3.	Lifting of water( HP pump)	3777.48unit
4.	Computer & Dept. Lab	14570.28unit
5.	Others( CCTV,TV, water cooler & others)	6475.68 unit

## c. Wastes-

- Total Students - 303 persons
- Other Stakeholders – 47 persons

- Total Stakeholders - 350 persons
- Hostel students- 130
- Departments - 09
- Student Hostels & Staff Quarters - 03 & 02

#### D. Wastes Management Policy:

- Biological Wastes treatment by Vermi-compost system .
- E-wastes- computers, electrical and electronic parts – Disposal by selling and use of e-container
- Chemical wastes – Laboratory waste – Not proper treatment
- Waste water – washing, urinals, and bathrooms in soak pits.
- Glass waste – Broken glass wares from the labs by selling.
- Napkin & Clothes incinerators- Disposal in earthen pit
- Plastic waste- disposal by selling
- Solid wastes – Damaged furniture, Iron & Metal scraps- Disposal by Selling
- Food wastes – Waste Rice, Vegetable, Paper plates- Disposal in Earthen pit and Compost pit.

#### Waste Audit and Assessment

Sl. No.	Object and Parameter	Observation and Finding
1	Degradable waste	75 (Kg/Day)
2	Non degradable	5 (Kg/Day)
3	Main Source of waste ( Organic)	Hostels, Canteen and Garden
5	Plastic waste management	Use of separate dustbin and Established of different waste unit

#### d) Green Campus-

Green cover of the campus- 1.98 acre area

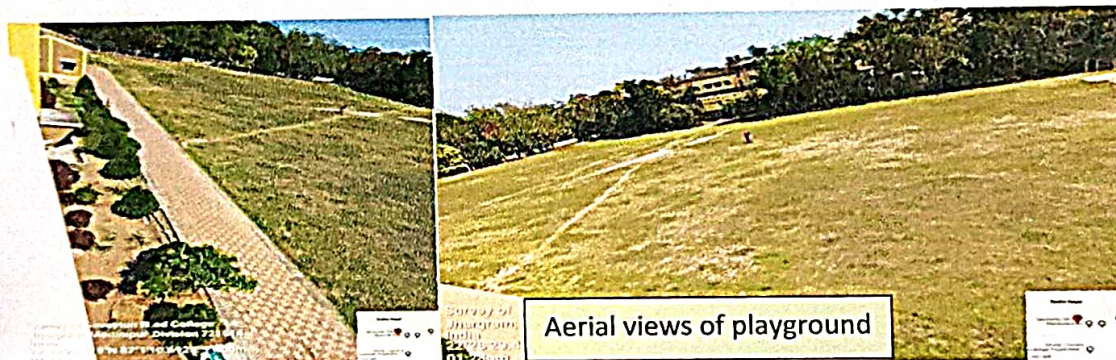
Free space including Playground- 2.1 acre area

### Crops cultivated in the campus:

Sajne , 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 College premises area.

Table -13 Biodiversity and Green Coverage

Sl. No.	Object and Parameter	Observation and Finding
1	Vegetation coverage area	38.3 %( 1.98 Acre)
2	Types of green coverage	<ul style="list-style-type: none"> <li>➤ Native and Natural Vegetation- 22%</li> <li>➤ Medicinal plants- 12%</li> <li>➤ Agro-plants- 42 %</li> </ul>
3	Different types of Animal	<ul style="list-style-type: none"> <li>➤ Mammals -Squirrel, Rat, Free ranging Cat, Free ranging Dog, Field Rat, Bengal Fox etc.</li> <li>➤ Amphibian-Snake, Frogs</li> <li>➤ Birds- Crow, Common Moyna, Pigeon, etc.</li> <li>➤ Insects- Ants, Butterfly, Spider etc.</li> </ul>
4	Biodiversity and Green Management Programme	<ul style="list-style-type: none"> <li>➤ Awareness program arrange by- college among the students and Stuff through the year</li> <li>➤ Observation and celebration of environmental days</li> <li>➤ Installation of different trees and plants naming plate</li> </ul>



### Campus farming

Organic vegetable cultivation as interim crop is another plan to be materialized soon. The department of Zoology has been consistently undertaking Fishes cultivation , and Botany department has been planting of flowers and ornaments trees in winter .

### e) Carbon Footprint-

- Number of Students & Staff using cycles - 15
- Number of persons using cars - 05
- Number of persons uses two wheelers - 10
- Number of students uses Buses - 150
- Number of persons using other transportations - 20
- Number of visitors per day - 08
- Number of Students staying in the hostel -130
- Average distance travelled by stake holders - 20-40 kms /day
- Expenditure for transportation per person per day - Rs.20-50/-

### 4.3 SUMMARY:

- I. The environmental awareness initiatives are adequate.
- II. The College campus is plastic free and maintained the outdoor air quality.
- III. The installation of solar panels, organic vegetable cultivation, Vermi composting practices are adequate.
- IV. There is NSS team of the College 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 "Clean 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		
SI No	Indicator	Weightage
1	Carbon & Smoke free	H
2	Exhaust fans & Ventilation	M
3	Emission of GHGs	M
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	H
2	Energy efficiency Audit	H
3	Air Quality & Carbon foot print Audit	M
4	Wastes Audit	H
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%

#### 4.4 Environmental Education:

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

- ❖ Setting up Water recycles and Reuse project for Drinking water purpose.
- ❖ Setting up of medicinal plant nursery, water management, vegetable cultivation, tree planting, energy management, landscape management programme , 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, Honey farm, Mushrooms, Indigenous fish farm etc. for providing proper training to the students.
- ❖ Conduct exhibition and poster competition on Green and Clean campus for sustainable and healthy academic environment.

#### 4.5 Common Recommendations

- ✓ 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
- ✓ Maintain of Indoor air quality
- ✓ Establish the crasser machine for plastic waste treatment
- ✓ Establish a biodiversity park
- ✓ Establish a scientific treatment unit for chemical waste management.
- ✓ Establish a solar pump house or solar submersible pump
- ✓ Adopt an environmental policy for the college
- ✓ Establish a purchase policy for environmental friendly materials

- ✓ Renovation of cooking system in the canteen to save gas and wooden fuel
- ✓ Installation of modern e-waste management unit

## 4.6 Criteria Wise Recommendations

### Water Audit

- Drip irrigation for gardens and micro irrigation technology can be initiated.
- Establish the Reduce and re-use water management methods.
- Remove damaged taps and install sensitive taps is possible.
- Establish rain water harvesting systems for each building and each campus.
- Establish the more water reuse unit in the Hostel & staff quarter's area.
- Establish water treatment systems.
- Awareness programs on water conservation to be conducted.

### Energy Audit

- ✓ 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 Audit

- ❖ 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 college campus.
- ❖ Establish a Regular functional bio gas plant.
- ❖ A model solid waste treatment system to be established.
- ❖ Establish an e-waste management unit
- ❖ Establish the crasser machine for plastic waste treatment

### Green Campus Audit

- ✓ All trees in the campus should be named scientifically with AI application.
- ✓ Establish a butterfly park.
- ✓ Establish an Orchid ex-situ zone .
- ✓ Develop the Fruits trees area for Birds conservation
- ✓ Establish a biodiversity park
- ✓ 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.

- ✓ Develop the Herbal and medicinal plants garden for large area
- ✓ 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.

### Carbon footprint Audit

- ❖ Establish the indoor plants in office rooms ,computer lab and other laboratories to CO<sub>2</sub> management
- ❖ Providing more college bus services to the students and staff.
- ❖ Encourage students and staff to use cycles.
- ❖ Establish a more efficient cooking system to save gas.





## Executive Summary: 2022-23

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 Sevayatan sikshan Mahavidyalaya, Jhargram, 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 Sevayatan sikshan Mahavidyalaya, Jhargram 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 College premises is 5.18 acre out of which about 1.98 acre areas is covered by trees, plants etc. and 2.1 acre areas is covered by grasses. 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 College has already taken some steps to protect the environment with help of teachers, staff and students under the guidance of Dr. Ashis Kumar Gupta, Principal, Sevayatan Sikshan Mahavidyalaya, Jhargram. 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 Sevayatan sikshan Mahavidyalaya, Jhargram, W.B.

23.04.2023

Sevayatan Sikshan Mahavidyalaya  
Quality Assurance



23.04.23  
Principal  
Sevayatan Sikshan Mahavidyalaya  
(A. Govt. Sponsored College)  
Sevayatan::Jhargram-721514  
West Bengal