GREEN AND ENVIRONMENTAL AUDIT REPORT
(2022-2023)

GOVERNMENT GENERAL DEGREE COLLEGE KHARAGPUR-II, WEST BENGAL

CONSULTRAIN MANAGEMENT SERVICES,
LAKE ROAD, KOLKATA

TROPICAL INSTITUTE OF EARTH AND ENVIRONMENTRAL RESEARCH (TIEER),
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Office address: M-10, Bidhannagar, Medinipur-721101, W.B., India

GREEN AUDIT CERTIFICATE

Academic Year: 2022-2023

This is to certify that Government General Degree College, Kharagpur-II, Ambigeria, Madpur, Paschim Medinipur, 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.

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

Govt. General Degree College Kharagpur-II

Principal / Officer-in-charge
Government of West Bengal
Govt. General Degree College at Kharagpur-II
Paschim Medinipur-721149, West Bengal

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ACKNOWLEDGEMENT

We, The Environment Audit Team thank the management of Government General Degree College at Kharagpur-II 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

AUDIT EXPERT MEMBERS

The Committee members are listed below:

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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
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10.	Sri Sarat Chatterjee	Surveyor & Assistant Researcher	Water and Air Quality Measurement
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12.	Sri Soumitra Patra	M.Tech in Agriculture and expert	Water conservation and Micro irrigation technology

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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 Government General Degree College at Kharagpur-II 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.

Meeting with Hon'ble Principal & IQAC Team

1.2 About the College :

Government General Degree College, Kharagpur-II or GGDC KGP-II (as our institution is fondly called by its stakeholders) has made its presence felt in the academic map of Paschim Medinipur since its inception in June 2015. Fulfilling the vision of our honourable Chief Minister to provide education for all, our college caters to a large number of first-generation learners and meritorious students alike from the remotest parts of the district. Our students, therefore, have been regular beneficiaries of Kanyashree Prakalpa and various scholarship programmes such as Aikyashree, SVMCM, Nabanna Scholarship, OASIS, and Jindal Scholarship to name a few. These help our students pursue either higher education or better career prospects. This college, in its seventh year now, is UGC 2(f) recognized and affiliated to Vidyasagar University. The college presently offers bachelor degrees in Arts and Science subjects. At present, we teach five Major subjects in Humanities: Bengali, English, History, Philosophy, and Political Science, and four in Sciences: Botany, Chemistry, Physiology, and Zoology. The Minor subjects taught are Bengali, English, History, Philosophy, Political Science, Botany, Chemistry, Mathematics, Physics, Physiology, and Zoology. We have modern and well-organized laboratories, a well-stocked library, a gymnasium, a spacious playground and a smart classroom for the use of our students. Our college is noted for its cultural programmes and various outreach activities organized by the NSS unit.

Table 1 Area Coverage of the College Campus

Area Coverage of College Premises:	Area in Percentage
Building and Construction	7
Playground and Fallow land	65
Vegetation Cover	19
Water Bodies	9

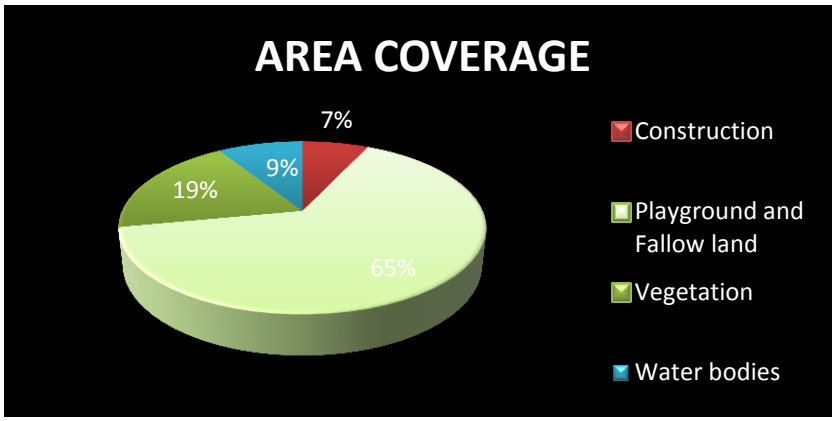


Fig. 1 Area Coverage of College Premises

General Information:

Total area of the college campus – 5.87 acre
Building area: 0.417 acres,
Green & Vegetated area: 1.112 acres.
Play Ground & Vacant land area: 2.5acre
Water Bodies area: 0.5 acre
Departments: 11 (UG Departments)
Laboratories: 09
Students: 414 .
Teaching & Non-teaching staff: 27 (Including Officer-in-Charge) + 08
Others stakeholder: 21
Total Stake holders: 470
Auditorium /Seminar hall: 02
Gymnasium Hall: 01

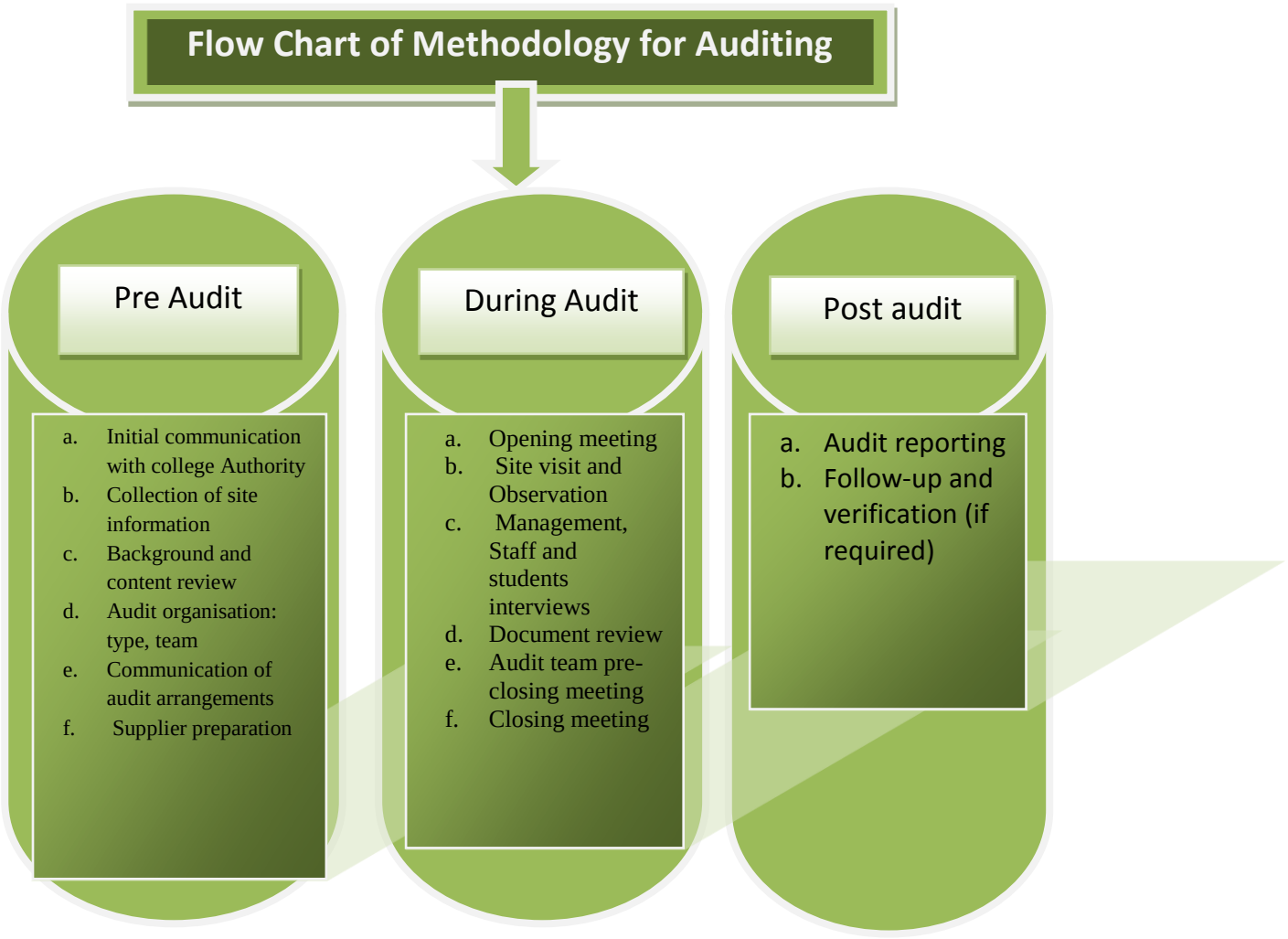
1.3 Purpose of Green and Environmental Auditing:

- 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.



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, canteen, library, All Department, office rooms, , 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.

Heritage tree of the College premises

Following steps were taken for data collection:

- Survey to each department, Laboratories, Library, canteen 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 form utility bills, reuse of water, waste management, use of energy-saving devices and e-waste. This information was added to the carbon footprint data, generating a fairly clearer picture of the emissions and impact of the reduction measures undertaken.

Campus observation

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.

Class room survey

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 Produce and Waste Management
5. Biodiversity and Green Zone management

Table-2 Total Stakeholders of the College

Students -	414 persons
Teaching, Non-teaching and Other Stakeholders	35 persons
Other stakes holder with Security Guards and Karmabandhu	21
Total	470 persons

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.

Surface Water bodies

a	Usage of water	That water is use for Drinking, Washing, Cleaning, Cooking, Bathing and gardening purpose. The maximum water is used for washroom in the college. About 4450Litre water has been supplied for that sector.
b.	Consumption of water	About 14500 Litre water per day
c.	Water wastage	The leakage and misuse of water is about 100 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.	Surface water Harvesting	The Micro surface water bodies are 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
washroom	45
Cooking and Cleaning	05
Gardening	34
Drinking	10
Others	09

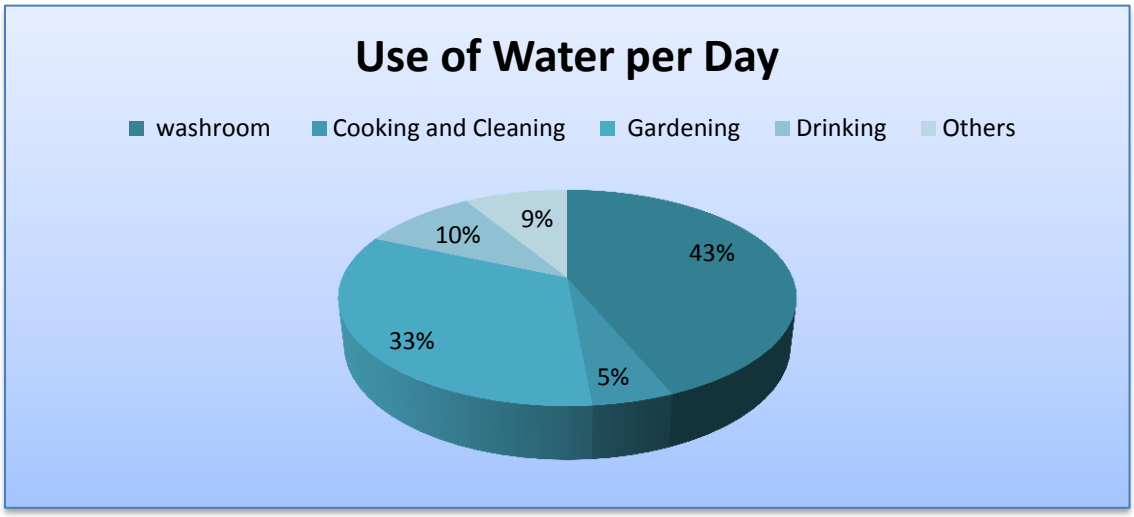


Fig.2 Use of water in Different Purpose Per Day

Taken Water management policy

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

* H denotes- Taken management policy level above 60%
** M denotes- Taken management policy level 40%-60%
*** L denotes-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.
b.	Energy consumption	The useable energy is Conventional energy. The used Electricity energy is 52764 units costing about Rs.6,99,206/- Per Year. The Maximum energy is consumed for Light & Fan, ACs and Computer Section amounting to 68% of total consumption.
c.	Usage of LPG	It has been observed that LPG gas cylinders are used in Canteen, & Laboratories (03 PC/year) for cooking and other purpose. There are Green generators used in the premises.

Electric power unit and Green generator

Table-4 Source of Energy in Percentage

Source of Energy	In Percentage
Conventional	100
Non -Conventional	0

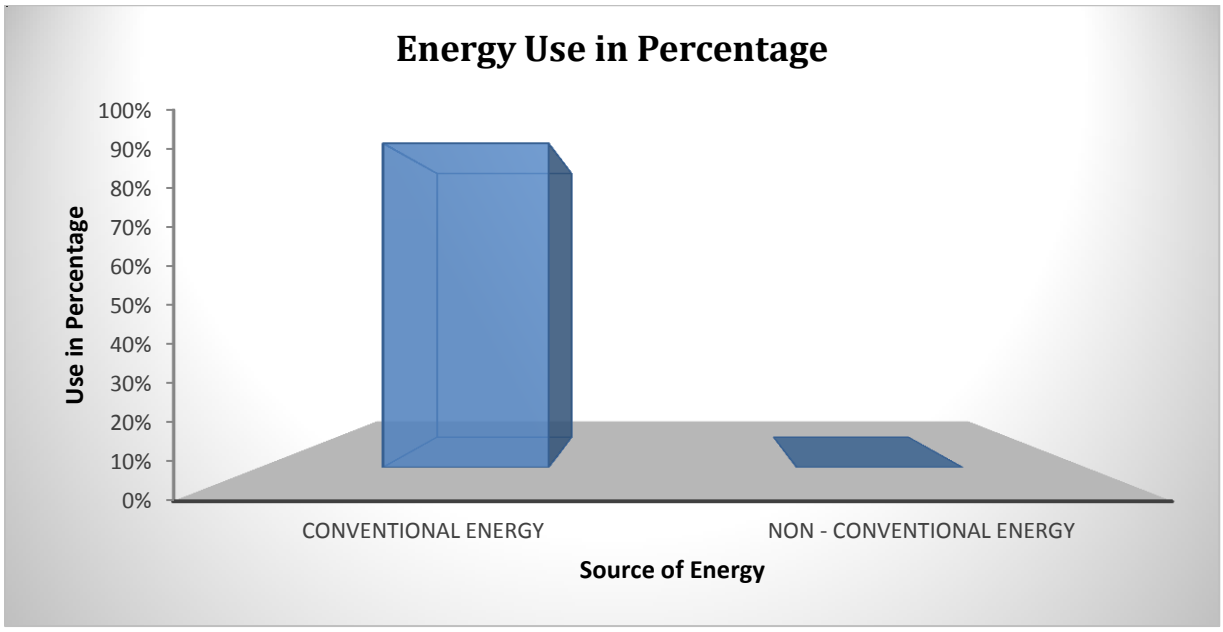


Fig. 3 Use of Energy in Percentage

Table-5 Energy Consumption for different Purpose in Percentage

Energy Consumption for different Purpose	In Percentage
light and fans	49
AC	16
Pump	3
Computer and Laboratory	27
Others	5

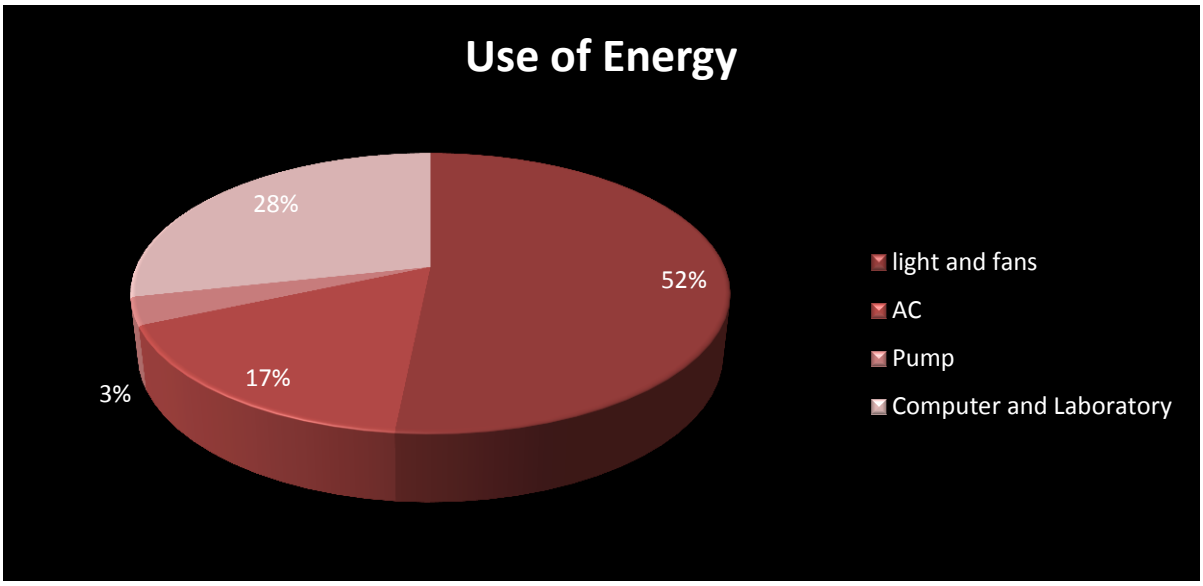


Fig. 4 Percentage of Energy Consumption in different Purpose

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

Measurement of Air Quality

most leading greenhouse gas, comprising about 214ppm (2022) 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 College Campus

Different location of the College Premises	Amount of CO2 (ppm)
Principal Office	460
Administrative Office	440
Head Clark office	420
Quarter	400
Canteen	430
Chemistry Lab	440
Computer Lab	460
Play Ground	400
Outdoor	400

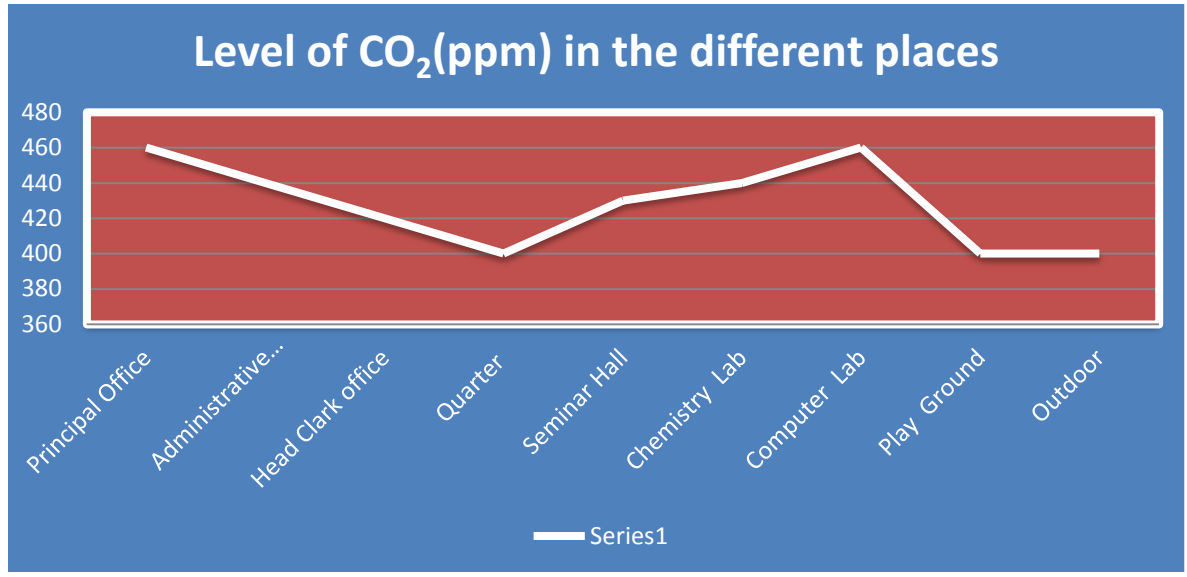


Fig. 5 Amount of CO2 (ppm) in Different Location of the College Premises

Table-7 Amount of CO_2 (ppm) in the air in different location,(College Campus) session 2022-2023

Amount of CO_2 (ppm) in the Air in Different places of the College Premises	Amount of CO_2 (ppm)
Outdoor	400
Indoor (Class room)	420
Indoor (Laboratories)	440

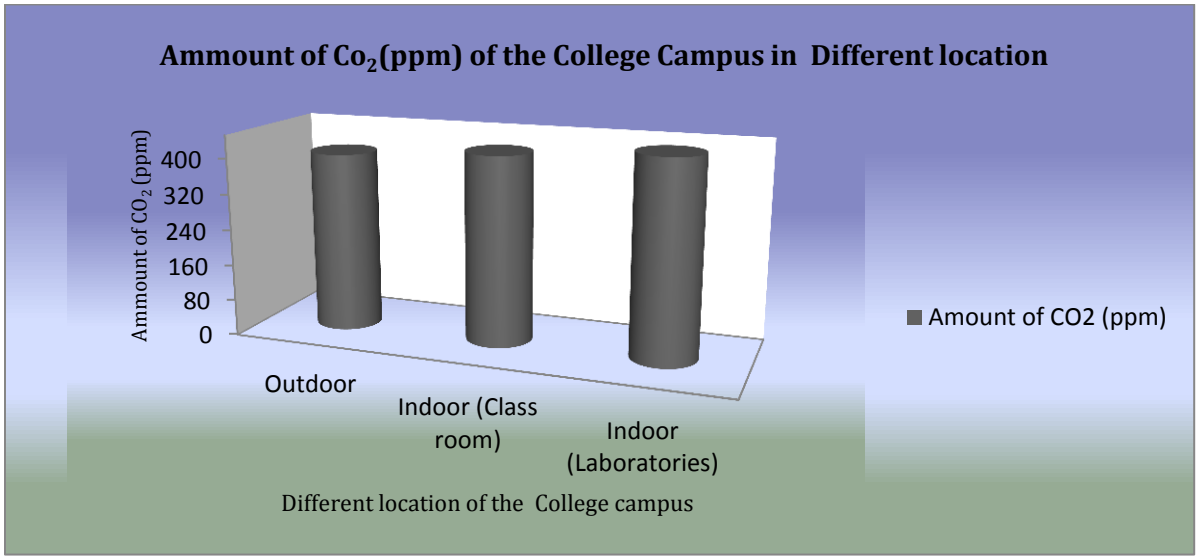


Fig. 6 Amount of Co_2(ppm) of the Air in Different location of the College Premises

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.
c) No Exhaust fans in washrooms and chemistry lab.

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

3.5 Generation of Waste and Waste Management:

Waste (or wastes) is useless or unusable materials or components which are discarded after principal use. Sometimes, it is a defective article and of no use. In modern outlook waste may be a valuable substance subject to an appropriate operation or action on the waste. With the context of waste management RRR (Reduce, Reuse and Recycle) model may be followed in appropriate fashion.
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	15
Non degradable	03

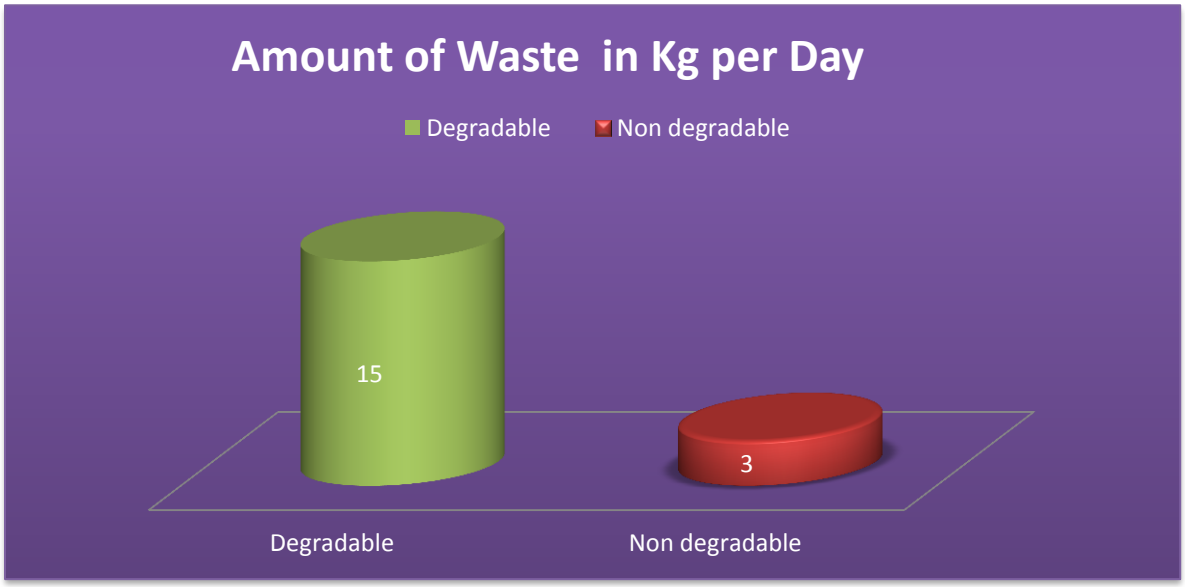


Fig. 7 Type and Amount of Waste

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, bacterial control, and natural control through plantation.

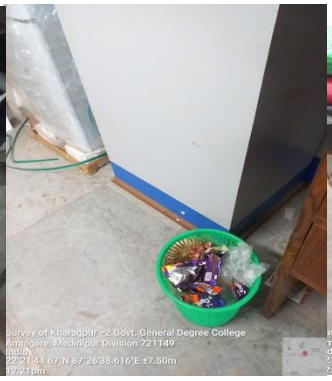


Table-9 Source of Wastage in Different Sector (per day in Kg)

Source of Wastage in Different Sector(per day in Kg)	Degradable wastage Amount in Kg.	Non Degradable wastage Amount in Kg.
Canteen & quarter	2	0.5
Office	2	1.0
Laboratories	1	1.0
Garden	9	0.25
Others	1	0.25

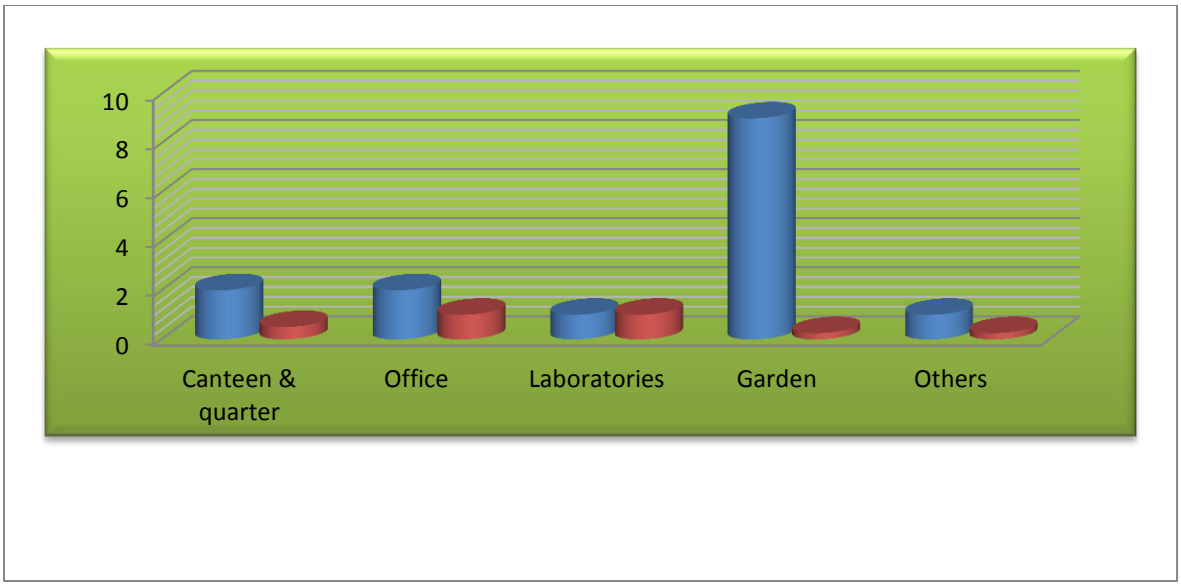


Fig. 8 Source and Amount of Wastage in Different Sector (per day in Kg)

The following are being emphasized during audit of waste management:


Observation of Medicinal Plants

a) Name of the waste

b) Category of waste

c) Quantity of waste

d) Hazardous effect of the waste

e) Institutional action and mechanism for waste management

Compliance audit of waste issues:

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

Performance Audit of Waste Issues:

Implemented wastes management		
Sl.no	Factors/Indicators	Weightage
1	Plastic and Polythene free	M
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%
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 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.

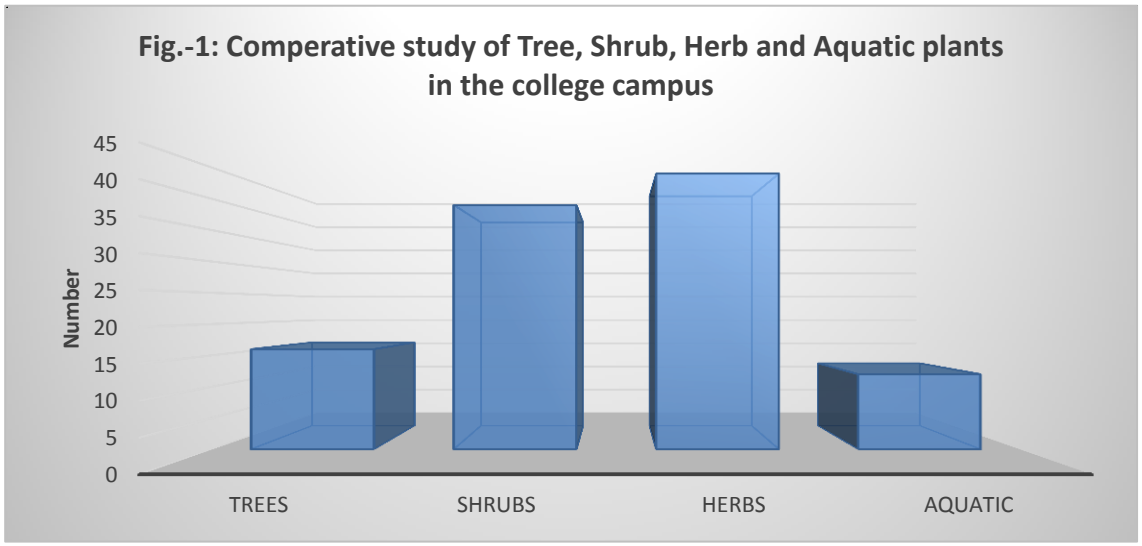
About 65% area is under greenery and biodiversity zone Biodiversity includes the genetic variability and diversity of life forms such as plants, animals, microbes etc. living in a wide range of ecosystems. Flora and fauna of College campus premises is rich.

Biodiversity Study

Floral diversity - Government General Degree College at Kharagpur-II has more than 6 acre of area (approx.). It is divided by different habitat, like terrestrial, aquatic (Two ponds), pond bank, dumping area, open area, etc. They have planted different types of plants in different habitat. Being a newly built college (2015) and college of south Bengal area, all types of cyclonic activities had affected here. Last two cyclones like Amphan (2018) and Yash (2019) and Corona epidemic had remarkable destruction here. They have lost new plantation as well as few old trees. The college authority has divided their land for in different types of plantation. They have identified the area for Medicinal plant garden, Spice garden and Fruit garden. Beside this they

also have different plantation programmes where Mango tree (*Mangifera indica*), Debdaru (*Polyalthia longifolia*), etc. plantation programme had been taken regularly as college activities in different past years. It is remarkable that there is a Aswatha tree (*Ficus religiosa*) at the North side of the Campus, as key stone species.

It is found from a rapid ecological study in the campus that there are 16 Tree species, 39 shrub species and 44 herb species and 12 aquatic species. (Table – 1a,1b, 1c 1d and Fig.-1).



There are following types of plants gardens

Flower Garden – A small flower garden is found after the main gate and in front of main building. Rose is the main plants but different seasonal varieties also planted (Table – 2). *Duranta erecta* has planted for hedge decoration. There are *Ixora coccinia*, *Datura metal* etc. scattered here and there. It seems that garden is just growing and needs maintenance.

Spice Garden – There is a small proposed spice garden in the south side of academic building. The area will be approximately 2-3 decimal.

Medicinal Plants Garden – There is a specific plot for medicinal plant garden. It is just behind the main gate. It is near about 5 decimal approx. in size to introduce the valuable plant to the students. Till now the garden is not fully constructed. But the campus is harboring near about 35species of medicinal plants (Table-3). The species like *Jatropha gossypiifolia*, *Leucas aspera*, *Mimosa pudica*, *Moringa oleifera*, *Nyctanthes arbor-tristis*, *Ocimum sanctum*,

Phyllanthus niruri, Scoparia dulcis, Senna occidentalis, Sida cordifolia etc. are scattered within the campus.

Fruit bearing trees – It is very good sign that the campus has a number of fruit bearing trees. Most of the trees are indigenous tree (Table-4). Like Guava, Jam, Bedana etc. There are approximately six fruit yielding tree species are found. All plants are in sapling stage. A large banana garden is found surrounding the large pond.

Following figure (Fig.-2) is showing a comparative diagram between total species and species of different gardens.

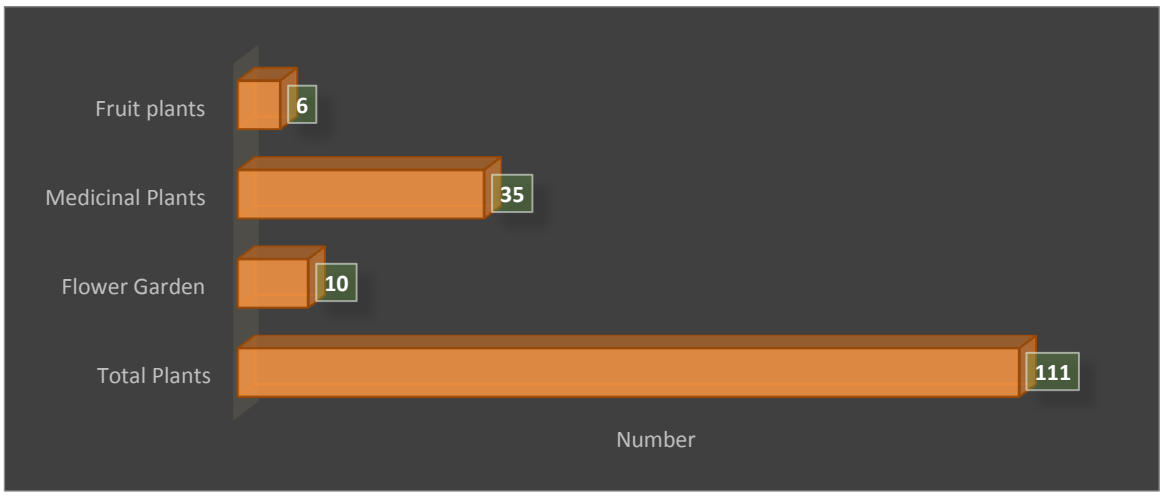


Fig. : Different types of plantations

Carbon stocking – There are very few trees within the college campus. There are only 6 trees are found like *Acacia auriculiformis, Albezia lebbek, Delonix regia, Azadirachta indica, Ficus religiosa* and *Neolamarckia cadamba.* Total Carbon sequestration potential is 3820.5kg. It is assumed that the probability of carbon stocking is per tree is 4250.67 kg (Table-5).

Table -1a: List of Trees in Government General Degree College at Kharagpur-II campus.

Sl. No.	*Scientific Name*	Local Name	Family
1	*Acacia auriculiformis*	Akashmoni	Fabaceae
2	*Albezia lebbek*	Khiris	Fabaceae
3	*Azadirachta indica* A.Juss.	Neem	Meliaceae
4	*Bombax ceiba* L.	Simul	Malvaceae
5	*Delonix regia*	Krisnachura	Fabaceae

6	*Ficus benghalensis* L.	Bot	Moraceae
7	*Ficus glomerata*Roxb	Jayogadumur	Moraceae
8	*Ficus religiosa* L	Aswatha	Moraceae
9	*Leucaena leucocephala* (Lam.) de Wit.	Jayanti	Fabaceae
10	*Mangifera indica*L.	Amm	Anacardaceae
11	*Moringa oleifera* Lam.	Sajne	Mringaceae
12	*Neolamarckia cadamba* (Roxb.) Bosser.	Kadam	Rubiaceae
13	*Nyctanthes arbor-tristis* L.	Seuli	Oleaceae
14	*Phoenix sylvestris* (L.) Roxb.	Khejur	Arecaceae
15	*Spondias pinnata* (Linn.f.)	Amrra	Anacardiaceae
16	*Ziziphus jujuba*Mill. (1768), nom. Cons.	Kul	Rhamnaceae

Table -1b: List of Shrubs in Government General Degree College at Kharagpur-II campus.

Sl. No.	Scientific Name	Family
1	*Annona Squamosa* L.	Annonaceae
2	*Boehmeria ramiflora* Jacq.	Urticaceae
3	*Calotropis gigantea* (L.) Dryand.	Asclepiadaceae
4	*Carica papaya* L.	Caricaceae
5	*Catharanthus roseus* (L.) G.Don.	Apocynaceae
6	*Cayratia trifolia* (L.) Domin	Vitaceae
7	*Clerodendrum indicum* (L.) Kuntze	Lamiaceae
8	*Coccinia grandis*(L.) Voigt	Cucurbitaceae
9	*Datura metel* L.	Solanaceae
10	*Ficus elastica*Roxb. Ex Hornem	Moraceae
11	*Hibiscus vitifolius* L.	Malvaceae
12	*Ipomoea aquatica*Forssk.	Convolvulaceae
13	*Ixora coccinea* L	Rubiaceae

14	*Jatropha gossypiifolia* L.	Euphorbiaceae
15	*Lantana camara* L.	Verbenaceae
16	*Malvastrum coromandelianum* (L.) Garcke	Malvaceae
18	*Mikania scandens* (L.) Wild.	Asteraceae
19	*Mimosa pudica* L.	Fabaceae
20	*Mirabilis jalapa* L.	Nyctaginaceae
21	*Musa acuminate* Colla	Musaceae
22	*Polyalthia longifolia*(Sonn.) Thwaites	Annonaceae
23	*Portulaca grandiflora* Hook.	Portulaceae
24	*Psidium guajava* L.	Myrtaceae
25	*Punica granatum* L.	Lythraceae
26	*Rhoeo discolor* (L'Hér.) Hance	Commelinaceae
27	*Rosa chinensis* Jacq.	Rosaceae
28	*Saccharum spontaneum*L.	Poaceae
29	*Sansevieria roxburghiana*Schult. &Schult.f.	Asparagaceae
30	*Scoparia dulcis* (L.) Kuntze.	Scrophulariaceae
31	*Senna occidentalis* (L.)	Fabaceae
32	*Sida cordifolia* L.	Malvaceae
33	*Solanum nigrum* L.	Solanaceae
34	*Solanum torvum* Sw.	Solanaceae
35	*Stephania japonica* (Thunb.) Miers	Menispermaceae
36	*Streblus asper* Lour.	Moraceae
37	*Swietenia macrophylla* King	Meliaceae
38	*Syzygium cumini* (L.) Skeels	Myrtaceae
39	*Tinospora cordifolia* (Thunb.) Miers	Menispermaceae

Table -1a: List of Herbs in Government General Degree College at Kharagpur-II campus.

Sl. No.	Scientific Name	Family
1	*Acalypha indica* L.	Euphorbiaceae
2	*Achyranthes aspera*L.	Amaranthaceae
3	*Adiantum lunulatum* Cav.	Pteridaceae
4	*Aerva lanata* (L.) Juss.	Amaranthaceae
5	*Ageratum conyzoides* (L.)L.	Asteraceae
6	*Aloe vera* (L.) Burm.f.	Asphodelaceae
7	*Alternanthera philoxeroides*(Mart.) Griseb.	Amaranthaceae
8	*Alternanthera sessilis* (L.)R.Br.ex DC.	Amaranthaceae
9	*Andrographis paniculata*(Burm.f.) Nees	Acanthaceae
10	*Barbula indica*(Hook.) Spreng. in Steud.	Pottiaceae
11	*Blumea lacera*(Burm.f.) DC	Asteraceae
12	*Boerhavia diffusa* L.	Nyctaginaceae
13	*Cardiospermum halicacabum* L.	Sapindaceae
14	*Christella dentata*(Forssk.) Brownsey &Jermy	Thelypteridaceae
15	*Chrysopogon zizanioides* (L.) Roberty	Poaceae
16	*Cleome rutidosperma* DC.	Utricaceae
18	*Coldenia procumbens* L.	Boraginaceae
19	*Colocasia esculenta* (L.) Schott	Araceae
20	*Commelina diffusa*Burm.f.	Commelinaceae
21	*Cuscuta reflexa*Roxb.	Convolvulaceae
22	*Cymbopogon citratus* (DC.) Stapf	Poaceae
23	*Cynodon dactylon* (L.) Pers.	Poaceae
24	*Desmanthus virgatus* (L.) Willd.	Fabaceae
25	*Desmodium triflorum* (L.) DC.	Fabaceae

26	*Desmodiumgangeticum* DC.	Fabaceae
27	*Eleutheranther aruderalis* (Sw.) Sch.Bip.	Asteraceae
28	*Eragrostis tenella* (L.) Roem. &Schult.	Poaceae
29	*Eupatorium odoratum* L.	Asteraceae
30	*Euphorbia hirta* L.	Euphorbiaceae
31	*Euphorbia milii* Des Moul.	Euphorbiaceae
32	*Evolvulu snummularius* (L.) L.	Convolvulaceae
33	*Kyllinga brevifolia*Rottb.	Cyperaceae
34	*Leucas aspera* (Willd.)	Lamiaceae
35	*Ocimum sanctum* L.	Lamiaceae
36	*Oldenlandia corymbosa* L.	Rubiaceae
37	*Partheniumhysterophorus* L.	Asteraceae
38	*Phyllanthus niruri* L.	Euphorbiaceae
39	*Pontederia crassipes* Mart.	Pontederiaceae
40	*Pouzolzia zeylanica* (L.) Benn.	Urticaceae
41	*Pteris vittata* L.	Pteridaceae
42	*Tradescantia pallida* (Rose) D.R. Hunt	Commelinaceae
43	*Tridax procumbens* (L.) L.	Asteraceae
44	*Vernonia cinerea*(L.) Less.	Lamiaceae

Table -1a: List of Aquatic plants in Government General Degree College at Kharagpur-II campus.

Sl. No.	Scientific Name	Family
1.	*Alocasia esculanta*	Araceae
2.	*Alternanthrea philoxeroides*	Asteraceae
3.	*Astracantha longifolia*	Acanthaceae
4.	*Commelina diffusa*	Commelinaceae

5.	*Eichhornia crassipes*	Potederiaceae
6.	*Enhydra fuctuens*	Asteraceae
7.	*Ipomoea aquatic*	Convolvulaceae
8.	*Jussia repens*	Onagraceae
9.	*Mikania scandens* (L.) Wild.	Asteraceae
10.	*Nymphea alba*	Nympheaceae
11.	*Salvinia sp.*	Salviniaceae
12.	*Urticularia Sp.*	Lentibulariaceae

Table -2 : Plants of flower Garden

Sl. No.	*Scientific Name*	Local Name	Family
1	*Catharanthus roseus* (L.) G.Don.	Nayantara	Apocynaceae
2	*Datura metel* L.	Dhutura	Solanaceae
3	*Duranta erecta*	Duranta	Verbenaceae
4	*Hibiscus vitifolius* L.	Jaba	Malvaceae
5	*Ixora coccinea* L	Rangan	Rubiaceae
6	*Mirabilis jalapa* L.	Sandha moni	Nyctaginaceae
7	*Portulaca grandiflora* Hook.	Morning glory	Portulaceae
8	*Rhoeo discolor* (L'Hér.) Hance	Rio	Commelinaceae
9	*Rosa chinensis* Jacq.	Golap	Rosaceae
10	*Sansevieria roxburghiana*Schult. &Schult.f.		Asparagaceae

Table-3 : List of Medicinal Plants Present in the Campus.

	Scientific name	Family
1	*Achyranthes aspera*L.	Amaranthaceae
2	*Aerva lanata* (L.) Juss.	Amaranthaceae
3	*Aloe vera* (L.) Burm.f.	Asphodelaceae
4	*Andrographis paniculata*(Burm.f.) Nees	Acanthaceae
5	*Azadirachta indica*A.Juss.	Meliaceae

6	*Blumea lacera*(Burm.f.) DC	Asteraceae
7	*Boehmeria ramiflora* Jacq.	Urticaceae
8	*Boerhavia diffusa* L.	Nyctaginaceae
9	*Calotropis gigantea* (L.) Dryand.	Asclepiadaceae
10	*Carica papaya* L.	Caricaceae
11	*Catharanthus roseus* (L.) G.Don.	Apocynaceae
12	*Cayratia trifolia* (L.) Domin	Vitaceae
13	*Cleome rutidosperma* DC.	Utricaceae
15	*Clerodendrum indicum* (L.) Kuntze	Lamiaceae
14	*Coldenia procumbens* L.	Boraginaceae
16	*Cynodon dactylon* (L.) Pers.	Poaceae
17	*Datura metel* L.	Solanaceae
18	*Desmodium gangeticum* DC.	Fabaceae
19	*Desmodium triflorum* (L.) DC.	Fabaceae
20	*Eupatorium odoratum* L.	Asteraceae
21	*Euphorbia hirta* L.	Euphorbiaceae
22	*Evolvulus nummularius* (L.) L.	Convolvulaceae
23	*Jatropha gossypiifolia* L.	Euphorbiaceae
24	*Leucas aspera* (Willd.)	Lamiaceae
25	*Mimosa pudica* L.	Fabaceae
26	*Moringa oleifera* Lam.	Mringaceae
27	*Nyctanthes arbor-tristis* L.	Oleaceae
28	*Ocimum sanctum* L.	Lamiaceae
29	*Phyllanthus niruri* L.	Euphorbiaceae
30	*Scoparia dulcis* (L.) Kuntze.	Scrophulariaceae
31	*Senna occidentalis* (L.)	Fabaceae
32	*Sida cordifolia* L.	Malvaceae
33	*Solanum nigrum* L.	Solanaceae
34	*Stephania japonica* (Thunb.) Miers	Menispermaceae

35	*Tinospora cordifolia* (Thunb.) Miers	Menispermaceae

Table -4: List of fruit plants present in campus

Sl. No.	*Scientific Name*	Local Name	Family
1	*Annona Squamosa* L.	Ata	Annonaceae
2	*Carica papaya* L.	Pepe	Caricaceae
3	*Musa acuminate* Colla	Kola	Musaceae
4	*Psidium guajava* L.	Peyara	Myrtaceae
5	*Punica granatum* L.	Bedana	Lythraceae
6	*Syzygium cumini* (L.) Skeels	Jam	Myrtaceae

Table -5 : Carbon sequestration potential of trees of college campus

Sl. No.	GBH Class (in cm)	No. of Trees	Biomass (in Kg.)	Carbon stock (in Kg.)
1	50-100	2	1336	668
2	100-150	3	5892	2946
3	200 - 250	1	7641	3820.5
			Total	**7434.5**

Faunal Diversity- The College has two ponds, trees, waste land, low land, banana garden which are habitat of faunal components. So, wide varieties of fauna are supporting its biodiversity. The college campus is the feeding and breeding ground of the many animals. Different types of earth worm, insects (moths, butterfly, wasp, and bees), amphibian, reptilian, birds and mammals are found near the large pond. There is one big, one small size pond are present under the college premises. In those ponds there have many indigenous fresh water fishes which are nourished. From conversation with faculty members, different stakeholders of the college, following information are collected.

Phylum: Annelida		
Local Name		Scientific Name
1	Kecho	*Pheretimaposthuma*

2	Joke	*Hirudinaria*sp
Phylum: Arthropoda		
1	Prajapati	*Papilio*sp
2	Moth	*Galleria* sp
3	Moumachi	*Apis*sp
4	Jonaki	*Lampyrisnoctiluca*
5	Arsola	*Periplanetaamericana*
6	Vimrul	*Vespa orientalis*
7	Lalpipra	*Oecophyllasmaragdina*
8	Kakrabicha	*Buthus*sp
9	Tetulbicha	*Scolopendra*sp
10	Kenno	*Julus*sp
11	Pangapal	*Schistoceragregaria*
12	Anopilis masa	*Anopheles* sp
13	Culex masa	*Culex*sp
14	Ades masa	*Aedes*sp
15	Gubrepoka	*Coprislunaris*
16	Pharing	*Orthetrum*sp
17	Wepoka	*Odontotermes*sp
18	Machi	*Muskadomestica*
19	Makarsa	*Nephila*sp
Phylum: Mollusca		
20	Sthalsamuk	*Acatinafulica*
21	Jalsamuk	*Pilaglobosa*
22	Gugli	*Bellamyabengalensis*
23	Jhinuk	*Lamellidensmarginalis*
24	Kath joke	*Limax*sp
Fresh water fishes		
1	Ruimach	*Labeorohita*
2	Katlamach	*Catlacatla*
3	Mrigelmach	*Cirrhinusmrigala*
4	Bata mach	*Labeobata*
5	Kalbose	*Labeocalbasu*
6	Batkurmach	*Glossogobiusgiuris*
7	Magurmach	*Clariasbatrachus*
8	Singimach	*Heteropneustesfossilis*
9	Latamach	*Channapunctatus*
10	Chang mach	*Channagachua*
11	Sholmach	*Channastriata*
12	Koi mach	*Anabasatestudineus*
13	Phaloimach	*Notopterusnotopterus*
14	Phutimach	*Puntiusticto*

15	Mourlamach	*Amblypharyngodonmola*
16	Techoka or Bostam pona	*Aplocheiluspanchax*
17	Kholsamach	*Colisa*sp
18	Pankalmach	*Mastacembelussp*
19	Dhariamach	*Esomusdanricus*
20	Chandamach	*Chanda*sp
21	Tangra	*Mystus*sp
Class : Amphibia		
1	Kuno bang	*Duttaphrynusmelanostictus*
2	Sona bang	*Ranatigrina*
Class: Reptilia		
1	Loudaga	*Ahaetullanasutas*
2	Jaldhora	*Xenochriphispiscator*
3	Matiali sap	*Elachistodonwestermanni*
4	Jamna sap	*Ptyasmucosus*
5	Godi sap	*Varanus*sp
6	Keute	*Naja*sp
7	Tiktiki	*Hemidactylusflaviviridis*
8	Girgiti	*Calottes versicolor*
9	Kachhap	*Tryonix*sp
Class : Aves		
1	Charaipakhi	*Passer domesticus*
2	Tuntuni	*Orthotomus*sp
3	Satbhaya	*Turdoideseaudatus*
4	Doyel	*Copsychussaularis*
5	Bulbul	*Pycnonotus*sp
6	Kak	*Corvussplendens*
7	Shalik	*Acridotherestristris*
8	Phinge	*Dicrurousadsimilis*
9	Kajalpakhi	*Laniuscristatus*
10	Kat thokra	*Dinopiumbenga*
11	Baspati	*Meropsorientalis*
12	Chotomachranga	*Alcedoatthis*
13	Sadabookmachranga	*Halcyon* sp
14	Tia	*Pisttacula*sp
15	Gughu	*Streptopeliachinensis*
16	Paira	*Columba livia*
17	Dahuk	*Amaurornisphooniurus*
18	Bak	*Ardeolagrayii*
Class : Mammalia		

1	Katbirali	*Funambuluspennantii*
2	Neul	*Herpestesedwardsii*
3	Mechobiral	*Prionailurusviverrinus*
4	Katas	*Felischaus*
5	Chucha	*Suncusmurinus*
6	Indur	*Bandicotabengalensis*

Table-10 Green Coverage of the College Premises

Green Coverage of the College Premises	Area in Percentage
Native and Natural Vegetation	40
Plantation	18
Agro-Plants	22
Medicinal Plants	12
Kitchen Garden	6

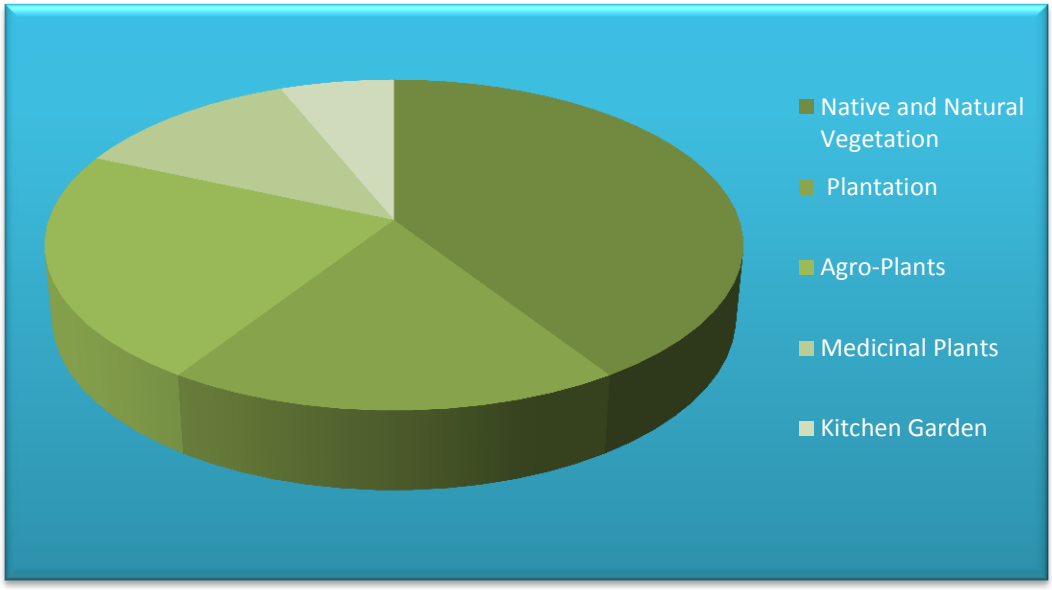


Fig. 9 Green Coverage of the College Premises

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	*Pycnonotusjocosus*	LC

2	Red Vented Bulbul	Bulbul	*Pycnonotuscafer*	LC
3	House Sparrow	ChotiCharai	*Passer domesticus*	LC
4	Eurasian Collared Dove	Par ghughu	*Streptopeliadecaocto*	LC
5	Oriental Turtle Dove		*Streptopaliaorientalis*	
	Spotted Dove	Chhiteghughu	*Streptopeliachinensis*	DD
6	Rock Dove	Rock Pigeon	*Columba livia*	LC
	Black Drongo	Finga	*Dicrurusmacrocercus*	LC
7	Asian Pied Starling	GuyeSalik	*Sturnus contra*	LC
8	White-breasted Kingfisher	SandabukMachhranga	*Halcyon smyrnensis*	VU
9	Common Kingfisher	ChottoMachhranga	*Alcedoatthis*	LC
10	House Crow	Kak	*Corvussplendens*	LC
11	Jungle Babbler	Chhatare/Satbhai	*Argyastriatus*	LC
12	Black-headed Oriole	BeneBau	*Oriolusxanthornus*	LC
13	Eurasian Golden Oriole	SonaBau	*Oriolusoriolus*	LC
14	Common Myna	Salik	Acridotherestristis	LC
15	Blue Rock Pigeon	GolaPayra	*Columba liviadomestica*	
16	Common Hoopoe	Mohonchura	*Upupaepops*	LC
17	Asian Koel	Kokil	*Eudynamysscolopacea*	LC
18	Rose-ringed Parakeet	Tia	*Psittaculakrameri*	LC
19	Brown Shrike	Karkata	*Laniuscristatus*	LC
20	Indian Treepie	HandiChacha	*Dendrocittavagabunda*	LC

Table-12 The Mammalian checklist is as follows-

SL. NO	COMMONNAME	BENGALINAME	SCIENTIFICNAME	IUCN RED LIST
1	FivestripedPalm Squirrel	Kath Berali	*Funambuluspennantii*	Least Concern (LC)
2	Free-rangingCat	Biral	*Felisdomesticus*	DD
3	Free-	Kukur	*Canisfamiliaris*	DD

	rangingDog			
4	AsianPalmCivet	Bham	*Paradoxurushermaphroditus*	LC
5	FieldRat	MethoIndur	*Bandicotabengalensis*	LC
6	GreyMongoose	Beji	*Herpestesedwardsii*	LC
7	HouseMouse	NengtiIndur	*Musmusculus*	LC
8	Small Indian Civet	Kotas	*Viverriculaindica*	LC
9	Bengal Fox	Fox	*Vulpesbengalensis*	LC
10	Indian gray mongoose	Neul	*Herpestesedwardsii*	LC

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

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

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(11000 liter)
2.	Capacity of water storage (Daily)	➢ Reservoir and Overhead tanks- 21000 liter ➢ Total amount of used & misused water- 14500ltr ➢ Total misuse of water-100 ltr
3.	Amount of used water per day	14400liter
4.	Misuse of water in daily	Leakage, overflow and Misuse-100 liter
5.	Maximum used of water per day - for and washroom purpose	42% (6000 liter)
6.	Amount of water for used per day- Drinking Purpose	10 % (1500liter)
7.	Gardening purpose	34%(5000 litre)
8.	Surface water Harvesting	The surface water bodies are available in college campus..
9.	pH level of drinking water	6.9- 7
10.	TDS level of drinking water	110ppm -125ppm

Water Quality Measurement

b. Energy

❖ Electricity Consumption - 52764 Unit, Rs.- 699206/- Per Year

❖ Fossil fuel consumption per Year:

a. Number of Gas cylinders used for cooking purpose(Canteen) – 01 PC
b. Number of Gas cylinders used in Chemistry Laboratory - 01 PC
c. Diesel used for green Generator- 50 liter

❖ Number of Green Generators - 01

❖ Cost of generator fuel – Rs. 4500/year

Energy Audit and Assessment

Sl. No.	Object and Parameter	Observation and Finding
1	Source of energy (conventional)	100 %
3	Total consumption of Electric Power	52764 unit
5	Maximum energy consumption in the purpose	Light and fans - 25854 Unit/year
6	Energy Consumption in Computer & Lab.	14246 unit /year
7	No. of LPG Gas cylinder for cooking purpose	01PC/ Year
8	No. of LPG Gas cylinder used in Laboratories	01pc/Year
9	Amount of diesel used for green generator	50 liter/Year
10	No. of AC and use of energy	8442unit /year

c. Wastes-

- Total Students - 414 persons
- Other Stakeholders – 56 persons
- Total Stakeholders - 470 persons
- Departments – 11
- Staff Quarters - 01
- Canteen- 01

D. Wastes Management Policy:

- Biological Wastes treatment by Vermi-compost system .
- 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 in Earthen pit and Compost pit.

- 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

Waste Audit and Assessment

Sl. No.	Object and Parameter	Observation and Finding
1	Degradable waste	15 (Kg/Day)
2	Non degradable	03 (Kg/Day)
3	Main Source of waste (Organic)	Canteen & Garden
5	Plastic waste management	Use of separate dustbin and Established of different waste unit

d) Green Campus-

Green cover of the campus- 1.112acre area

Free space including Playground- about 3 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 College premises area.

Table 13 Biodiversity and Green Coverage

Sl. No.	Object and Parameter	Observation and Finding
1	Vegetation coverage area	19 %(1.112 Acre)
2	Types of green coverage	➢ Native and Natural Vegetation- 40% ➢ Medicinal plants- 12% ➢ Agro-plants- 22 %
3	Different types of Animal	➢ Mammals -Squirrel, Rat, Free ranging Cat, Free ranging Dog, Field Rat, Bengal Fox etc. ➢ Amphibian-Snake, Frogs ➢ Birds- Crow, Common Moyna, Pigeon, etc. ➢ Insects- Ants, Butterfly, Spider etc.

4	Biodiversity and Green Management Programme	➢ Awareness program arrange by- college among the students and Stuff through the year ➢ Observation and celebration of environmental days ➢ Initiative to Installation of different trees and plants naming plate

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 – 220
- Number of persons using cars – 02
- Number of persons uses two wheelers – 25
- Number of students uses train - 230
- Number of persons using other transportations – 20
- Number of visitors per day – 15
- Average distance travelled by stake holders – 5-15 kms /day
- Expenditure for transportation per person per day – Rs.30 /-

4.3 SUMMARY:

I. The environmental awareness initiatives are adequate.
II. The College campus is plastic free and maintained the outdoor air quality.
III. Fruits garden , organic vegetable cultivation 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 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 are taken to initiative to installation.

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	H
2	Energy efficiency Audit	M
3	Air Quality & Carbon foot print Audit	H
4	Wastes Audit	M
5	Green & Biodiversity Audit	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%

4.4 Environmental Education:

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

- 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 , Nursery hubs 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

- ✓ Maintain of Indoor air quality
- ✓ Establish a solar pump house or solar submersible pump
- ✓ Adopt an environmental policy for the college
- ✓ 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
- ✓ Installation of modern e-waste management unit
- ✓ Establish the crasser machine for plastic waste treatment

- ✓ Establish a biodiversity park
- ✓ Establish a scientific treatment unit for chemical waste management.

4.6 Criteria Wise Recommendations

Water Audit

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

Energy Audit

- ✓ Installation of 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

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- ❖ 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 canteen and Quarters of college campus.
- ❖ 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.
- ✓ Establish a biodiversity park
- ✓ 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.
- ✓ 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 Audit

- ❖ Establish the indoor plants in office rooms ,computer lab and other laboratories to CO_2 management

Group discussion

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 Government General Degree College,Kharagpur-II,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 Government General Degree College,Kharagpur-II 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 5.87 acre out of which about 1.112 acre areas is covered by trees, plants etc. and 0.5 acre areas is covered by surface water bodies and wetland 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. Partha Sarathi Singha, Principal, Government General Degree College, Kharagpur-II. 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 Government General Degree College,Kharagpur-II,W.B.