INTERNAL AUDIT ON ENVORONMENT, GREEN & ENERGY 2022-2023

Prepared By:

Department of Environmental Studies

Department of Botany

Department of Zoology

Bidhan Chandra College

Asansol - 713304

Report of Environmental Audit/Green Audit:

1.0 Introduction

The Environmental Audit and/or Green Audit is considered as systematic identification, quantification, recording, reporting and analysis of the different aspects as well as components of the environment and environmental issues related with human activities. The 'Environmental Audit' / 'Green Audit' focuses to measure the various factors involved in environmental practices in and around the Institutional campus; actually, it plays an important role on the ambient and environment-friendly atmosphere and its impacts on the stakeholders. It is designed with an objective to look after the activities performed by the organization in relation to safe environment, otherwise which can create risks to the health of dwellers and the environment.

Under the present format of AQAR and SSR Environmental Audit/Green audit is a mandatory factor as per requirement of National Assessment and Accreditation Council (NAAC) under the Criteria VII, which is a self-governing organization of India, which declares the Institutional Grade.

1.1 About the College:

Bidhan Chandra College, Asansol, Paschim Bardhaman was established in 1961 at Asansol and Dr. Sarvapally Radhakrishnan laid down the foundation stone of this College in commemoration of Dr. Bidhan Chandra Roy. It was established with a contribution of Rs 1,11,111/- by a philanthropist, Sri Sasthi Narayan Gorai. Previously, it was affiliated to the University of Burdwan, presently affiliated to Kazi Nazrul University, since 2015. Primarily, it started with the courses in English, Bengali, Sanskrit, History, Logic and Philosophy, Economics, Political Science, Mathematics. Later, in course of time, the College has opened some new courses like Physics, Chemistry, Hindi, Urdu, Accountancy, Taxation, Zoology, Botany, Geography, BBA, BCA and one PG Course in English since 2013. It was first accredited by NAAC in 2017 with B grade (2.32). The College has a lush green garden containing some very rare plants sprawling over a vast expanse of land inside the campus. In course of time, the institutional vision has widened and developed to establish the goals to provide higher education as well as quality education in a good ambience. Presently, there are 16 Honours subjects, 19 general subjects and 1 PG. At present, there is one UGC Girls Hostel inside the College campus.

2.0 Executive Summary:

During the initial planning of the audit, an analysis was conducted in order to identify, evaluate and prioritize the risks associated with the environmental sustainability. In accordance with the Format of Green Audit and Evaluation Plan, B C College, Asansol, Paschim Bardhaman, West Bengal has prepared it for the years 2019-'20 and 2020'21. Audit was conducted in the month of June 2023. B C College, Asansol, Paschim Bardhaman is concerned and believes that there is an urgent need to address these local problems and redress the conditions. Being an old traditional built institution of higher learning, the College has initiated 'The Green Campus' program few years back.

The purpose of the audit is to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel

considered key in the environmental management in the campus. The criteria and methods used in the audit were based on the identified risks. The methodology used included physical inspection of the campus, review of the relevant documentation, and interviews.

3.0 Significant Observations:

1. College has a good green ambience covering 20.55 acre approx. with a green area of 65,200 Sq.mt and has constituted its own Environmental Audit Team for protection of environment and safety of all stakeholders.
2. The College has implemented the first Green Policy on 2018.
3. The College has constituted the "College Environmental Committee" in the name of 'ECO WARRIOR' and conducted so far 03 meetings during the years 2022-'23 following the Green Policy and has taken efforts for maintaining greenery in the College campus.
4. Students are used to celebrate Earth Day, World Environment Day, Ozone Day, International Biodiversity Day, etc.
5. Some of the best practices such as campus cleaning, recycling campaigns, electronic waste management, anti-plastic campaigns, training on vermicompost and tree plantation programmes are conducted on regular basis.
6. College is maintaining the disposal of all sorts of wastes, e-wastes and hazardous chemicals wastes.
7. NSS has adopted two villages and are engaged in awaring the rural people on education of children, sanitation, waterlogging, garbage dumping, etc.
8. College has conducted Environmental Awareness programmes and workshop on importance of medicinal plants.

However, after detailed paper examinations and physical verification it is noted that, some of the practices are required to be followed by the College in implementing the Green Policy of the institution and the applicable standards. In addition, certain processes could benefit from further review in order to improve their efficiency, fairness and consistency.

4.0 Statement of Assurance:

As far as possible and appropriate audit procedures completed and evidence gathered to support the accuracy of the conclusions reached and contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit with the established criteria.

GREEN AUDIT WORKING FORMAT:

5.0 Audit Framework and detailed findings:

The following audit framework is used for conducting Green Audit in years 2022-'23. The framework also lists the findings and observations for every criterion.

Control objectives	Control(s)	Audit Observations
Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse	Reduce the absolute amount of waste that it produces from the Institute & Staff offices.	The College has used some controls to reduce the absolute amount of waste that it produces from the departments, staff offices etc.
	Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, Batteries, print cartridges, cardboard and furniture.	College has to take the advantages of waste management through Asansol Municipality. Formal MoU be maintained for long-term basis and periodical monitoring.
	Compost, or cause to be composted, all organic waste, green waste and un-recycled cardboard produced in or collected from kitchens, gardens, offices and rooms.	The College uses different colour bins for disposal of differently segregated wastes. Un-recycled cardboard produced in or collected from departments, gardens, offices and class rooms are disposed as solid wastes.
	Recycle or safely dispose of white goods, Computers and electrical appliances.	Some safe disposal methods have been adopted for electrical wastes, e-wastes, printer cartridges etc.
	Use reusable resources and containers and avoid unnecessary packaging where possible	No, the College has not so far used reusable resources and containers and unnecessary packaging where possible.
	Provide sufficient, accessible and well publicized collection points for recyclable waste, with responsibility for recycling clearly Allocated.	The College has limited scope of accessible and well-publicized collection points for recyclable waste.
Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse	Make specific arrangements for events, such as cultural Events, internal and external seminars and conferences, where significant recyclable waste is likely to be produced, in order to both minimize the waste produced and maximize	The College practices a few arrangements for events, such as Cultural Events, International and National seminars and Conferences, where significant recyclable wastes are likely to be produced.

	what is recycled/reused	
	Promote reuse of items and waste recycling among staff students and conference guests through training. posters and incentives	The College has limited scope of reuse of items and waste recycling among staff, students and conference guests through trainings. posters and incentives.
	Dispose all waste, whether solid or otherwise, in a scientific manner and ensure that it is not released directly to the environment	Yes, the College disposes all wastes, whether solid or otherwise, but not released directly to the environment.
Reduce energy consumption, especially of energy derived from fossil fuels	Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.	College has not been able to install Solar panels. For maintaining all other properties College is dependent on energy-purchasing consortium.
	Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity	The College has no choice other than State Electricity Board.
	Look into the possibility of on-site micro-generation of renewable electricity.	Proposal of installation of Solar panels have been initiated.
	Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy saving light bulbs	The College is using LED (40%) as much as practicable. At least 80% of e-notice is generated for academic & Administrative purposes.

Reduce energy consumption, especially of energy derived from fossil fuels	Encourage staff, students and conference-guests to save energy through visible reminders, incentives and information to increase awareness. This particularly concerns turning off electrical appliances when not in use in both communal and residential rooms	Misuse of electricity is controlled by turning off the appliances when not required. All the stakeholders are aware and doing their best and practices 'switch off drill' to save electricity. But regular monitoring system is lacking.
	Ensures that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available	Students and all the members are used to follow this practice.
	If there are equipment's running on standby mode, reduce the energy consumption on standby mode or minimize the running of equipment's on standby mode	Some of the equipment's are running on standby mode.
	Purchase efficient and environmentally sound appliances in order to fulfil the commitments in section 2, and consider replacing old stock with 'greener', more efficient alternatives.	College is positive about increasing greenery by planting in front of the campus and maintaining plants as much as possible; cleanliness is maintained by the students. Tree plantation programmes are followed in different occasions on regular basis.
Minimize the use of unsustainable transport	Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staff and students.	The College is well connected through bus and train services, so all of them mostly avail bus/train services.
Minimize the use of unsustainable transport	Reduce the proportion of travel on the University/Institute business carried out in private transport and eliminate unnecessary and inefficient use of the University/Institute vehicles	College does not have any common bus services to all stakeholders.
	Promote car sharing / car pool among the students and faculty members	The College is not promoting car sharing/car pool among the students and faculty members.

Minimize consumption of water.	Repair sources of water leakage, such as dripping taps and showers as quickly as possible.	Regular checking and maintenance of pipelines are done to control the water wastage. Misuse and wastage of water from sources are taken care of.
	Install appliances which reduce water consumption.	Practiced as much as possible.
	Encourage a decrease in water usage among staff, students and conference guests.	College has taken some steps to encourage a decrease in water usage among staff students and conference guests.
	Use an efficient and hygienic water storage mechanism is to minimize the loss of water during storage.	College has a hygienic water storage mechanism to minimize the loss of water during storage.
	Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity.	Water filters with RO, aqua guards are installed at the strategic locations in the campus for the students.
	Install Water recycling mechanism, such as rain water harvesting system	Two harvesting pits are prepared to collect rainwater from the main buildings.
	Ensure that all cleaning products used by the University/Institute staff have a minimal detrimental impact of the environment, i.e., are biodegradable and non- toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations	Negligible amount of cleaning/washing liquids are used in the College and all the toilet cleaners are Eco-friendly.
	Minimize the use of fertilizers and pesticides in the University/Institutional gardens, opting for the use of compost produced on site wherever possible	Negligible amount of fertilizers and pesticides are used in the campus for maintenance of tree etc.

	Dispose the chemical waste generated from the laboratories in a scientific manner	Proper disposal system of toxic and hazardous chemicals from the laboratories is to be followed.
	Reduce the practice of burning plastic and other materials that emit the harmful gas on burning is prevented in the campus.	No such burning.
	Establish a Garden in the campus	College has a garden of some medicinal plants within the Campus.
	Encourage the faculties and students to plant tree in the garden.	College conducts tree plantation programmes through students and staff members on regular basis and in different occasions. Choice-plantation, fruit plantation like guava, mango etc. may be planted within the campus.
	Reviews periodically the list of trees plantedin the garden periodically	Periodical maintenance is followed.
Ensure that environmental awareness is created.	Conduct nvironmental awareness workshops as a part of the program.	Environmental awareness programmes are organized for conservation of nature and Natural resources, wildlife, and biodiversity. College celebrates World Environment Day, Ozone Day etc.
Ensure that environmental awareness is created.	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	College conducts seminars and awareness programmes to ensure environmental sustainability, and involvement of students is encouraging.
	Reduce the rate at which the University/Institute contributes to the depletion and degradation of natural resources	College is not directly or indirectly participating in depletion and degradation of Natural resources.
	Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service	Compulsory ENVS paper of 50 marks (4 credits) in the syllabus as per University guidelines for all the students of all streams to develop Environmental Awareness.

Ensure that the buildings conform to green standards.	Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission	New constructions are following the green standard.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Establish the University/ Institute Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy	College has an Environmental Committee in the name of ECOWARRIOR and conducted so far three (03) meetings since 2022.
	Ensure that on the Nature Club/Environmental Committee there will be appropriate representatives of the relevant university departments and authorities -such as catering, gardening, maintenance, cleaning and finance	Environmental Committee is constituted by the representative from all such sections to maintain the campus.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Ensure that on the Environmental Committee there will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact	College has constituted ECOWARRIOR headed by one Convenor.
	Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will monitor progress and set measurable targets wherever possible	Environmental Committee has taken the responsibility to follow the environmental policy.
	Ensure that the Environmental Policy is enforced regardless of whether its requirements exceed the mandate of the law	College practices and adopts the Green policy.

	Require that every staff and student member recognize their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice	Members of the Environmental Committee are following the practices.
	Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings	'Green Audit' is conducted this year in june 2023.

Recommendations:

Following the audit, several recommendations were made to the management.

Criteria	Recommendations
Publication of Audit Report	Resolutions of the "College Environmental Committee" along with audit report to be published in the College website-
Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse	1. The College should go for ISO 9001:2015 Certification. 2. The College should install Effluents Treatment Plant (ETP) and Sewage Treatment Plant (STP). 3. College may go for partnership with local Asansol Municipal Corporation in monitoring of disposal of solid wastes through providing outreach program. 4. Disposal of chemical wastes, solid wastes through licensed agents.
Reduce energy consumption, especially of energy derived from fossil fuels	1. Use energy efficient lighting fully in and around the campus; outdoor lighting be managed and followed in the order of eco- friendly system. 2. Number of Energy and flow meters to be installed for monitoring of energy and water consumption building wise/department wise.
Maintenance of Campus and biodiversity	1. PUC (Pollution under control) certificate for all the vehicles entering the campus to be made mandatory and to be checked by security. 2. Development of maintenance of PBR year wise for different locations by students. 3. Choice-plantation, fruit-plantation, artificial nesting, etc., be strengthened to attract birds and other animals with in the campus.
Proper cleaning of water storage Tanks	1. Proper initiative for cleaning the water tanks on regular basis considering the health & hygiene of the all stakeholders. 2. Wastage of water be managed carefully
Project-based learning on Environment related subjects	1. More number of projects be initiated to start with technical, skill-oriented and hands-on-training programmes for environmental monitoring.

6.0 Objectives and Scope:
The purpose of this audit was to ensure that the Green Policy is followed and implemented in the campus, across all departments, administrative bodies and students.

7.0 Methodology:
The methodology includes - preparation and filling up of questionnaire, screening of the report, physical interaction with the members in presence of Principal and the Members of the College Environmental Committee as well as Members of IQAC, record checking and review of the submitted documentations, interviewing key persons and data analysis, measurements and recommendations. It works on the several aspects of Environmental Audit and Green Audit including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

a. In order to meet these objectives, this audit was based on report submitted by the College authority and reviewing of relevant documents as far as possible and interviews with authority, Coordinator and staff members physically.
b. Review of the Documentations
c. For the purpose of this audit, the Green Policy of the institute was reviewed. Other relevant standards, Green audit framework etc., was also considered.

Interviews
Interviews were conducted with the Principal, IQAC Coordinator, Coordinator of College Environmental Committee and also members of the Committee.

Physical Inspection
Physical inspection was made on 12th of June 2022 and report was prepared based on the physical verification and validation and interaction with the members of the College.

8.0 Declaration:
I agree with all the recommendation and observations mentioned

Date: 12.06.2023
Place: B C College, Asansol.

Dept. of Botany
Bidhan Chandra College
Asansol

Dept. of Zoology
Bidhan Chandra College
Asansol

Principal
Bidhan Chandra College
Asansol

BIDHAN CHANDRA COLLEGE
Govt. Sposored
Estd.-1961
ASANSOL-4

Co-ordinator
Internal Quality Assurance Cell (IQAC)
Bidhan Chandra College
Asansol-4

HISTORY OF GREEN AUDIT :

An environmental audit, also known as a green audit, is a comprehensive evaluation designed to identify environmental compliance and management system gaps, as well as recommend corrective actions. It is akin to financial audits but focuses on eco-friendly practices. The term "Green" signifies environmental friendliness. This concept can be abbreviated as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). Another term for green auditing is "Environmental Auditing."

There are two main types of environmental audits: compliance audits and management systems audits. Compliance audits are more common in the US and within US-based multinationals. The term "protocol" in environmental audits refers to the checklist used by auditors to guide their audit activities. Current technology supports various computer-based protocols that simplify the audit process by converting regulatory requirements into yes, no, or not applicable questions.

A Green Audit involves the systematic identification, quantification, recording, reporting, and analysis of components of environmental diversity. It aims to analyze environmental practices within and outside a college campus, impacting the eco-friendly ambiance. The audit helps assess risks to health and the environment, providing direction on improving environmental conditions. Factors driving Green Audits include campus greenery, sustainability, adherence to green standards, and monitoring of environmental policies through awareness programs.

The purpose of the audit is to ensure that campus practices align with the institution's Green Policy. The methodology involves preparing and filling out questionnaires, physically inspecting the campus, reviewing documentation, interviewing key personnel, and analyzing data to make recommendations. Green Audit focuses on various aspects of a 'Green Campus,' including water conservation, tree plantation, waste management, paperless operations, alternative energy use, and biodiversity mapping.

It aims for a campus with zero environmental footprint, positive impact on occupant health and performance, and 100% graduates demonstrating environmental literacy. The goal is to reduce CO2 emissions, energy, and water use while creating a healthy learning environment for students. The college must focus on water conservation, tree plantation, waste management, paperless operations, alternative energy use, and biodiversity mapping for a 'Green Campus.'

Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management

A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use. Water is used for drinking purpose, canteen, toilets, laboratory and gardening. Loss of water must be checked, neither by any leakages, nor by over flow of water from overhead tanks.The green audit practically involves use of renewable sources, conservation of the energy, rain water harvesting program, and efforts of carbon neutrality, plantation of trees, E-waste management and hazardous waste management.

1. GENERAL INFORMATION

1.1 Year of Establishment of college:1961

1.2 History behind the establishment of the college: Internationally renowned scholar and the then Vice President of India, Dr Sarvapally Radhakrishnan laid the founding stone of Bidhan Chandra College in Asansol and the College was established in 1961 to serve the growing demands of the Asansol Burnpur industrial region. An initiative of the Asansol Educational Development Committee, Bidhan Chandra College also known as B.C. College named after one of the founding figures of West Bengal Dr. Bidhan Chandra Roy is government sponsored public university situated in Asansol **(23°40′36.91″N 86°57′09.67″E).** Sri Sasthi Narayan Gorai donated the sum of Rs.1,11,111 to support their noble cause in the establishment of the college. Bidhan Chandra College is currently affiliated to Kazi Nazrul University whilst previously affiliated to the University of Burdwan.Bidhan Chandra College (Government Sponsored), Asansol, District Paschim Burdwan, West Bengal is a co-educational institution established in the year 1961. The members of the Asansol Educational Development Committee, a Relief and Welfare Society took initiative in founding this college and Sri Sasthi Narayan Gorai donated the sum of Rs.1,11,111 to support their noble cause. The institution owes its name to Dr. Bidhan Chandra Roy – an illustrious son of Bengal and one of the early Chief Ministers, and its foundation stone was laid by Dr. Sarvapally Radhakrishnan, an internationally acclaimed scholar of Indian Philosophy and the then Vice President of India. Since then, we have been one of the major higher-educational institutions of West Bengal affiliated with Kazi Nazrul University and approved by the University Grants Commission.

1.3 Total campus area: 20.55 Acre or 83162.899 Square Meter
1.4 Total built up area: 10992.4 Square Meter
1.5 Total open space area: 72170.499 Square Meter
1.6 Total green area: 65200 Square Meter
1.7 Whether the college is implementing the Green Policy for the first time: Yes, The college implements the green policy for the first time on 21.03.2018.

Whether green audit is followed annually, if so, please produce the year-wise recommendations of the auditor along with report.
Yes, The green audit is followed annually.

The Environmental Audit team has made short term and long-term suggestions for environmental protection. To improve the environmental quality and realization of values of environment and for sustainable development different Environmental Management system or procedure must be needed.

Some recommendations to towards environmental management are as follows: (2022-23):

1. Sensor based energy conservation should be encouraged more.
2. Replacement of conventional ceiling fans with efficient ceiling fans.
3. Total replacement of conventional classroom tube lights with LED tube light.
4. It is observed that, there is no proper drainage system in Teaching Staff quarters which is urgently required.
5. Solar energy panels should be installed as alternative energy resources. The public lights within the campus may be run with solar panels.
6. Green habitat concept should be adopted for all the building construction activities of college.
7. Uses of bicycles should be promoted.
8. Separate toilets are required for different abled students.
9. Increase environmental promotional activities for spreading awareness among students in the campus.
10. Propose a system for collection and disposal of waste sorted out as organic and others on a daily basis, managed by the campus administration.
11. Considering contamination of water with coliform bacteria, water purification treatment facilities may be installed within the campus in order to ensure safe drinking water.
12. For water conservation manual water taps should be replaced with auto closed water taps. Drip irrigation for gardens can be initiated. Establish water treatment system to recycle drain water. Create automatic drip irrigation system during summer holidays.
13. All trees in the campus should be named scientifically.
14. Not just celebrating environment day but making it a daily habit. Encourage students not just through words but through action for making the campus green and eco-friendly.
15. College authorities are advised to dispose the e-waste to only government authorized vendors.

1.8 Whether college has constituted the "College Environmental Committee", "yes", "no" and "not applicable" (if so, give the details of it)

Yes the college has constituted College Environmental Committee named as " **ECO WARRIOR"**

1.8.1 Name of the Committee members:

Kasturi Chatterjee, Sagarika Mukherjee, Anwesha Bandyopadhyay, Manjulika Dey, Sriparna Roy and Debdyuti Sengupta,

1.8.2 Number of meetings conducted so far: Total Eight meetings have conducted.

1.8.3 Resolution of the meetings:

- Sensor based energy conservation should be encouraged more.
- Solar energy panels should be installed as alternative energy resources. The public lights within the campus may be run with solar panels.
- Green habitat concept should be adopted for all the building construction activities of college.
- Increase environmental promotional activities for spreading awareness among students in the campus.

- For water conservation manual water taps should be replaced with auto closed water taps. Drip irrigation for gardens can be initiated. Establish water treatment system to recycle drain water. Create automatic drip irrigation system during summer holidays.
- All trees in the campus should be named scientifically.
- Not just celebrating environment day but making it a daily habit. Encourage students not just through words but through action for making the campus green and eco- friendly.

1.8.4 Action taken by the Committee:

A) Reuse of Non-Biodegradable waste.

B) Medicinal Garden.

C) Rain Water Harvesting.

D) Vermicomposting.

1.8.5 Future programmes of the Committee:

A) Drip Irrigation and Sprinkler Irrigation.

B) Proper Plantation of the Annex Campus.

C) Improve Energy Savings of Electrical Equipments.

1.8.6 Policy enforcement strategies:

To achieve the goal of water conservation – Rain Water Harvesting, Drip irrigation and Sprinkler Irrigation.

To achieve the goal of Environmental Conservation and promote Eco friendly activities - Recycling campaigns, Electronic Waste Management, Anti-plastic campaigns and Tree plantation Programme.

To achieve Sustainable Development goals - Several Awareness Programme organized.

1.9 Whether college has conducted any awareness/responsibility programme among the staff members: "yes", "no" and "not applicable" Yes, The college conducts awareness program at regular interval.

1.10 Whether all the departments/teachers/non-teaching members/students are aware about the need of the environmental protection and audit: "yes", "no" and "not applicable"

Yes, All the Departments, Teachers and Non-teaching members and Students are aware about the need of the Environmental Protection and Audit.

1.11 Whether college has involved the students as volunteers in greening programmes: "yes", "no" and "not applicable"

Yes, The College regularly involve Students as volunteers in greening programmes on Earth Day, Environment Day, Ozone Day and on International Bio diversity Day.

1.12 Whether construction/demolition/repairing are in compliances with green standard: "yes", "no" and "not applicable"

Yes. The construction/demolition/repairing of college are in compliances with green standard.

1.13 Whether college has conducted any workshop/seminar/lecture on environmental awareness programme inside and/or outside the campus: "yes", "no" and "not applicable"

Yes. National Seminar on **"Impacts of Open Cast Mining on Environment."**

1.14 Whether the institute has department of Law/Environmental Science/3-Year degree Course/Course curriculum "yes", "no" and "not applicable"

(if so, how does it takes part in greening programmes)

Yes, Different Departments regularly involve their students as volunteers in greening programmes on Earth Day, Environment Day, Ozone Day and on International Bio diversity Day etc.

1.15 Whether college provides any community services, if so, give details (as Annexure): "yes", "no" and "not applicable"

Yes, A village is adopted by NSS. Education of Children, sanitation, Waterlogging, Garbage dumping look after by NSS students.

1.16 Whether the students are aware about the use of medicinal plants (any lecture/seminar/conference organized on it): "yes", "no" and "not applicable"

Yes, The Students are aware about the use and importance of medicinal plants. A lecture was organized on that topic.

1.17 Comments on the following:

1.17.1 **Plantation program**: Yes, Plantation programmes organized at regular interval.

1.17.2 **Formation of Natural club/Eco club**: Eco club is present named as "Eco-Warrior".

1.17.3 **Management of natural resources, wildlife, conservation of species**:

Yes, The students are aware of "Management of Natural Resources, wildlife, and conservation of species"

1.17.4 **Any project sponsored by national funding agency/NGO, independent project related to environmental issues: Y / N**

No. In future college will take initiative to perform this.

1.17.5 **Is there any incidence of burning of plastics containing garbage within the campus for necessary reduction: Y / N:** No. The Biodegradable and the Non-Biodegradable substances are separated through two bin concepts.

1.17.6 **Celebration of 5th June, Ozone day, Earth Day etc.: Y / N**

Yes. Students observed World Environment Day, Ozone Day, Earth Day, International Bio diversity Day, Water Day etc.

1.17.7 **Number of field visits/survey records: Y / N (if Y number)**

Total number of field visit= **22.**
Department of Environment=**1.**
Department of Botany=**2.**
Department of Geography=**6**. Department of Zoology =**8**.
Department of B.B.A and B.C.A =**3**.
Department of Chemistry =**2.**

1.17.8 **Campus biodiversity register**

Campus Biodiversity Register is maintained.

1.18 General aspects (express in statements)

1.18.1 Campus cleanliness

Campus regularly clean by Staff and Students.

1.18.2 Rainwater harvesting

The college practices the process of Rain Water Harvesting.

2 rainwater harvesting ponds are present of dimensions 25 ft. × 20 ft. × 6 ft. and 20 ft. × 20 ft. × 6 ft. respectively to store rainwater and use it for various purposes.

1.18.3 Solar street lamps

No, there is no provision of solar street lamp.

1.18.4 Carbon dioxide neutrality on the campus by developing greenery

Yes, Carbon dioxide minimize through developing greenery.

1.18.5 Man-made nest to attract some birds to maintain ecological balance:

Yes. There are man made nest to attract birds.

1.18.6 Restriction in use of plastic and plastic products

The college initiate awareness program on ill impacts of plastic products on Environment. India taking all steps to ensure it becomes free single use of plastic by 2022:

Prime minister Modi pledged to make the country free of single use of plastic. So we took several steps in this direction. We perform plastic free campus campaign at the regular interval of time. The main motto of these programs are to eradicate the use of plastic. The NSS volunteers and Eco club members of our college have taken an initiative to organize a program of plastic free around the campus.

Another program was organized by the ecoclub members of the college on 17/9/2022 on International Ozone Day.

On 05.06.2023 on the day of world Environment Day we organized another plastic free campus campaign.

Campaign around the campus.

Holding pluck cards volunteers were reaching all the shops nearby area and made sure the rules and regulations about the usage of plastics are followed.

Awareness was made on all the harmful effects of plastic on environment.

Volunteers remove all plastic from the campus and they took necessary action around the college area, specially they visit all shops near our college and take all the plastic from those shops and told all shop keeper not to use plastic bags...

All the volunteers cleaned all the plastic papers around our college campus. Our Initiatives to protect the environment from plastic: -

- Our college discourage the use of plastic wrappers to bring lunch.
- Students will be encouraged to carry lunch in a steel Tiffin box and water in steel/glass bottle.
- We use eco-friendly disposable plates when we arrange any events in our campus.
- We always spread awareness about plastic free environment among our students in college area.

1.18.7 Culture of some ducks, swans etc., for scenic beauty in pond or any water body resources (if available)

No.

1.19 Green monitoring by green committee/volunteers/team

Yes, Green Monitoring performed and report prepared by Eco club.

1.20 Training on vermicomposting

Yes, Training on Benefits of Vermicomposting organized.

Benefits of vermicomposting

- It recycles the biodegradable waste.
- Low cost procedure or practically free.
- It destructs pathogens and kills weed seeds.
- Reduces mass, volume and odour.

1.20.1 Celebration of 'No vehicle Day' on a particular day

No.

1.20.2 Dams inside the campus to meet the demand for water

Not Applicable.

1.20.3 Installation of fire safety instruments in all the buildings/departments

Yes. The Fire Safety instruments are present in all the buildings.

1.20.4 Toilets/separate toilets for differently abled students

1.20.5 Yes, The separate toilet facility for differently abled students is present.

1.20.6 Over all noise level

Sl no.	Inside campus area	Outside campus	Class room	Lawn	Office	Laboratory	Canteen
Unmeasured							

1.21 Is there any device (preferably HVS: High Volume Sampler) for measuring ambient air quality in the campus (if so, pl mention the data month wise): "yes", "no" and "not applicable"

No, There are no devices are present to measure ambient air quality.

2 WATER MANAGEMENT

2.1 Whether college has an efficient and hygiene water storage mechanism to minimize the loss of water during storage

"Yes", "no" and "not applicable"

Yes, the college has efficient and hygiene water storage mechanism to minimize the loss of water during storage. . The main source of water in our college is municipal water by AMC which is available 24/7 but there is also a water tank of dimensions 20 ft. × 13 ft. × 5 ft. 7 inch for emergency purposes.

2.2 Whether college is using water filter with RO, Aqua Guard and/or large water filter with cooler at the strategic locations in the college. If so, are they under AMC: "yes", "no" and "not applicable"

Yes, The College is using water filter, Aqua Guard and water filter with cooler at the strategic locations in the college. They are not under AMC.

2.3 Whether college has its own mechanism in repairing of water leakage: "yes", "no" and "not applicable"

Yes, The College has its own mechanism in repairing of water leakage.

2.4 Is there any rainwater harvesting unit in college: "yes", "no" and "not applicable"
(if so, what are the uses of this water:)

There are two rainwater harvesting units in college.

a) Recharging ground water.

b) Gardening.

2.5 Whether college has developed any reuse and recyclable of water system: "yes", "no" and "not applicable"

No

2.6 Is there any scope of measurement of water quality parameters used in hostel, lab, office, canteen, tap water (if so, parameters: pH, EC, TDS *etc*.)

2.7 Lab-wise water consumption (lt/d)

Chemistry: 90 lt/d (approx.) Zoology: 5 lt (approx.)

Botany: 2 lt/d (approx.)

Physiology: N/A (approx.)

Geography: 2 lt/d (approx.)

2.8 Whether college has sufficient/adequate drainage system: "yes", "no" and "not applicable"

Yes, The college has sufficient and adequate drainage system.

3 ENERGY CONSERVATION

3.1 Reduction of energy consumptions, especially fossil fuel energy

3.1.1 Average electric consumption amount..... KWH/Yr

Rs. 226453 (2021)

Rs.640833 (2022)

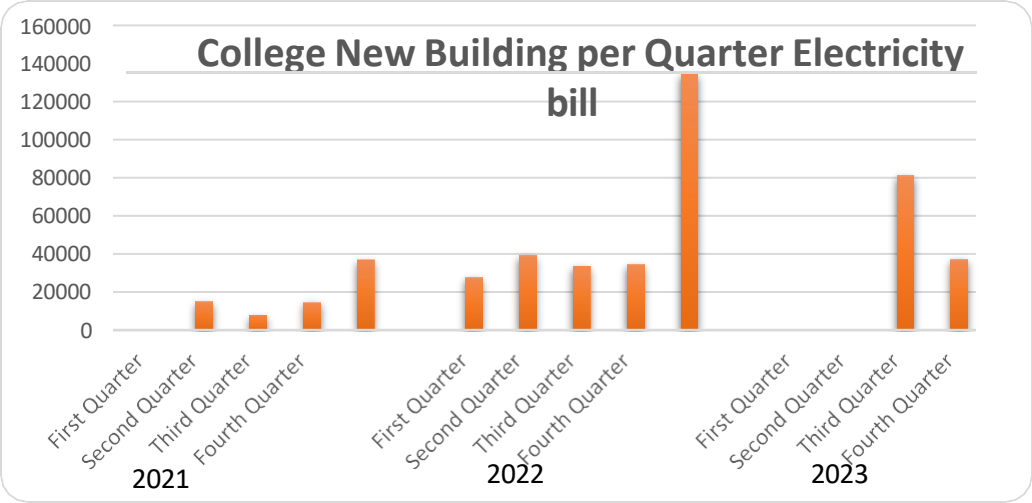
Rs.494001 (2023)

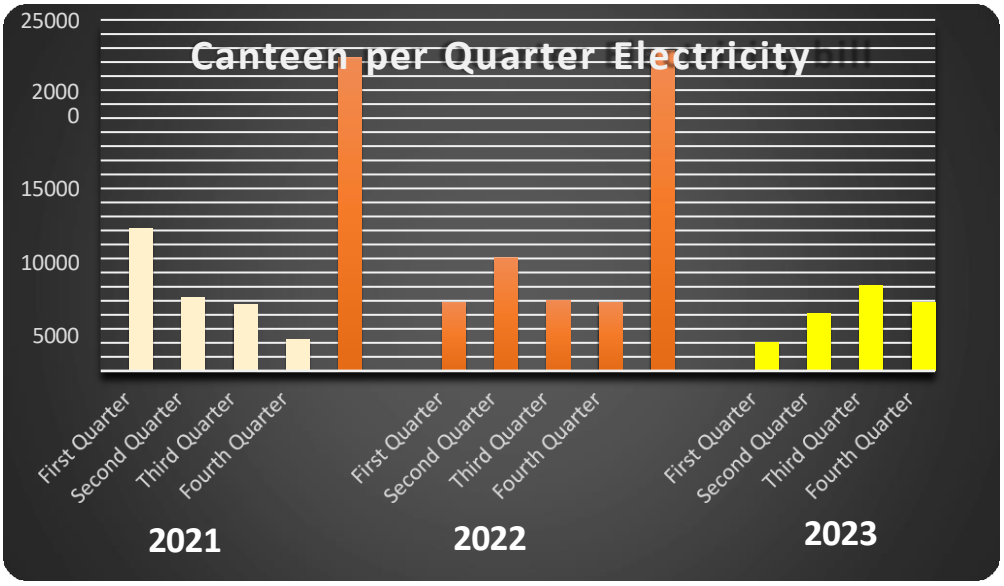
27067 KWH/Yr

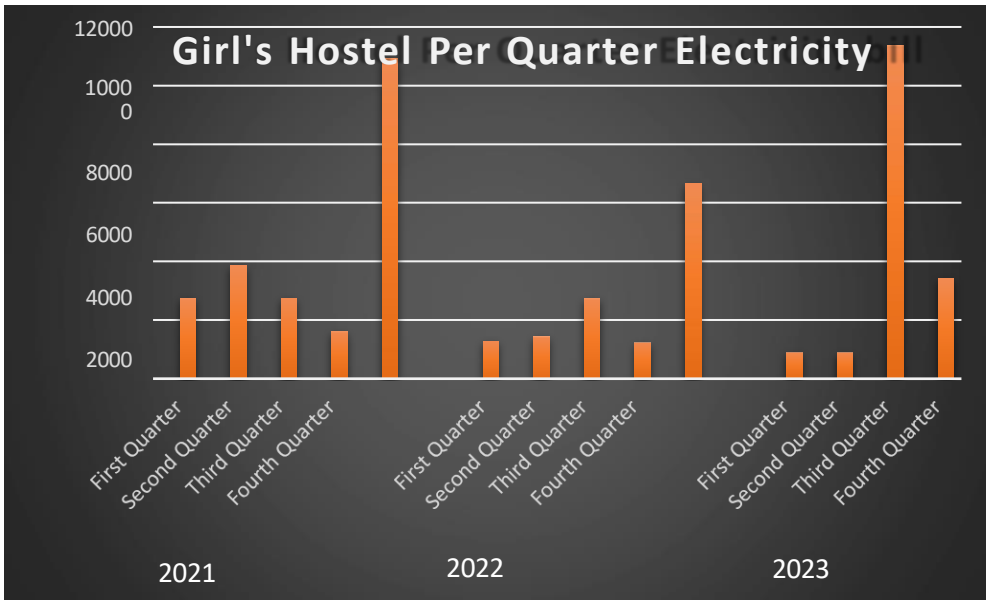
3.1.2 Average electrical consumption in a month …

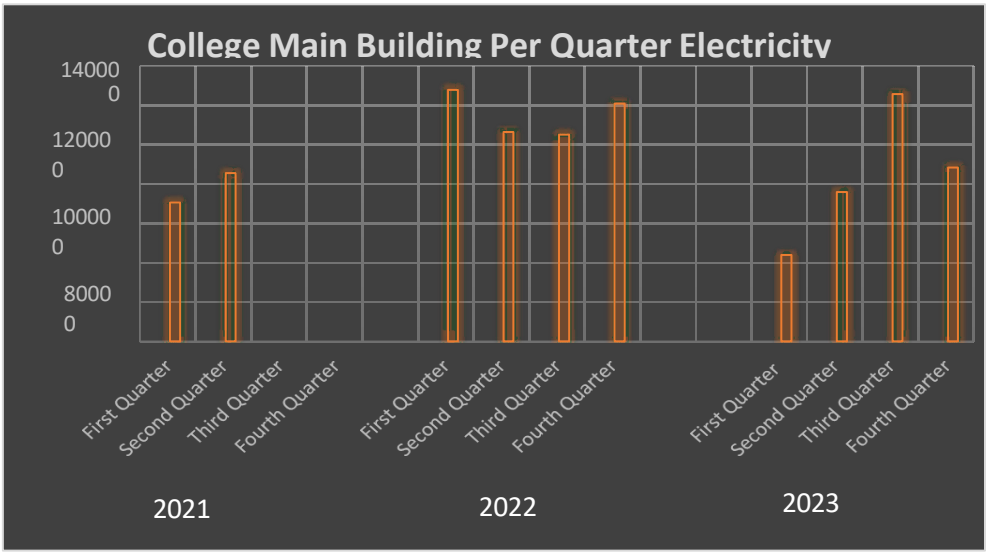
Rs. 53402.75

2255.58 KWH/Month.




Canteen per Quarter Electricity
25000
20000
15000
10000
5000
First Quarter
Second Quarter
Third Quarter
Fourth Quarter
2021
2022
2023


Girl's Hostel Per Quarter Electricity
12000
10000
8000
6000
4000
2000
First Quarter
Second Quarter
Third Quarter
Fourth Quarter
2021
2022
2023


College Main Building Per Quarter Electricity
140000
120000
100000
80000
First Quarter
Second Quarter
Third Quarter
Fourth Quarter
2021
2022
2023

Place	Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Bill
Principal Quarter		---	-	-		
	2022			7524	8604	16128
	2023	425	3093	1570	2938	8026
Canteen	2021	10153	5209	4722	2266	22350
	2022	4870	8044	5051	4889	22854
	2023	2028	4092	6059	4881	17060
Girl's Hostel:	2021	2730	3847	2739	1615	10931
	2022	1283	1429	2726	1234	6672
	2023	883	886	11358	3425	16552
New Building	2021		14802	7507	14704	37013
	2022	27613	39006	33667	34425	134711
	2023	----	----	80943	37343	118286
College Main Building	2021	70580	85579			156159
	2022	127884	106428	105177	120979	460468
	2023	43976	75980	125771	88350	334077

3.1.3 Total No. of

1. **LED and CFL - 210**
2. **Tube lights - 405**
3. **Fans -232 (All)**
4. **Air conditioners/Air Coolers - AC 26**
5. **Bulb - 130**
6. **Projector – 13**
7. **Desktop – 91**
8. **Printer cum Scanner and Xerox Machine – 8**
9. **Printer – 5**
10. **Laptop – 6**
11. **Lamination Machine- 1**
12. **Barcode Scanner- 4**
13. **Colour printer- 1**

Statement of ICT Enable classrooms and seminar halls

Sl.No.	Room No.	Room Details	ICT Tools used
1	**106**	**Classroom(ICT Enable)**	**Projector and Wifi**
2	**114**	**Classroom(ICT Enable)**	**Projector and Wifi**
3	**128**	**Classroom(ICT Enable)**	**Projector and Wifi**
4	**131**	**Classroom(ICT Enable)**	**Projector and Wifi**
5	**211**	**Classroom(ICT Enable)**	**Projector and Wifi**
6	**213**	**Classroom(ICT Enable)**	**Projector and Wifi**
7	**216**	**Classroom(ICT Enable)**	**Projector and Wifi**
8	**222**	**Classroom(ICT Enable)**	**Projector and Wifi**
9	**307**	**Classroom(ICT Enable)**	**Projector and Wifi**
10	**316**	**Classroom(ICT Enable)**	**Desktop,Sound system,Smart Board,Projector and Wifi**
11	**323**	**Classroom(ICT Enable)**	**Projector and Wifi**
12	**H-208**	**Classroom(ICT Enable)**	**Projector and Wifi**
13	**H-306**	**Classroom(ICT Enable)**	**Projector and Wifi**

3.1.4 Whether college has any provision/choice of renewable and carbon-neutral electricity options: "yes", "no" and "not applicable"

No, The college does not have any provision/choice of renewable and carbon-neutral electricity options. The college is planning to build up solar energy panels.

3.1.5 Whether college has planned to install solar panels: "yes", "no" and "not applicable" (if so, Project installed/working: Date/Month/Year)

Not Yet. The college is planning to build up solar energy panels.

3.1.6 Whether college has efficient water heating system: "yes", "no" and "not applicable"

Not Applicable.

3.1.7 Whether the staff members of all sectors are concerned in turning off electrical appliances when not in use in both commercial and residential area: "yes", "no" and "not applicable"

Yes. The staff members of all sectors are concerned in turning off electrical appliances when not in use in both commercial and residential area.

3.1.8 Is there any monitoring system – like put off the main switch where there is no need of electricity: "yes", "no" and "not applicable"

Yes.

3.1.9 Whether the users follow the appropriate and measurable targets for a reduction of energy, such as, computer, printers, electrical equipment when not in use: "yes", "no" and "not applicable"

Yes. The users follow the appropriate and measurable targets for a reduction of energy, such as, computer, printers, electrical equipment when not in use through stand by mode.

3.1.10 Is there any options for equipment's running on standby mode: "yes", "no" and "not applicable"

Yes. options for equipment's running on standby mode present in every electrical equipments.

3.1.11 Whether college has taken initiative to purchase efficient and environmentally sound appliances in order to fulfill the green budget: "yes", "no" and "not applicable"

Yes. The college has taken initiative to purchase efficient and environmentally sound appliances in order to fulfill the green budget.

3.1.12 Whether college has its own mechanism in repairing of electrical fault: "yes", "no" and "not applicable"

Yes.

3.1.13 Whether the class rooms are with sufficient illumination in day time and ventilation: "yes", "no" and "not applicable"

Yes.

Number of lights & fans in class room (average): 5 Fans and 5 Tube light.
Use of light & fans in the day time (average hours): 5 hours.
Number of windows per class: 6.
Natural light source in day time (in hours) (average per class): 5 hours.

3.1.14 How many (%) e-notice generated by the college for academic/administrative purposes in a month

80%

3.1.15 How many (%) paper-notice generated by the college for academic/administrative purposes in a month

20 %

3.1.16 Total number of computer, printer, Laptop, Xerox machine

3.1.16.1 Desktop – 91
3.1.16.2 Printer cum Scanner and Xerox Machine – 8
3.1.16.3 Printer – 5
3.1.16.4 Laptop – 6
3.1.16.5 Lamination Machine- 1
3.1.16.6 Barcode Scanner- 4
3.1.16.7 Colour printer- 1
3.1.16.8 Xerox Machine - 2

3.1.17 Whether college has organized lectures on energy conservation in order to give awareness to the students:
"yes", "no" and "not applicable"

Yes. The college organized lectures on energy conservation in order to give awareness to the students.

3.2 Energy conservation strategies

3.2.1 Whether the architectural design for college is based upon use of natural lighting & ventilation, to save extra power for bulbs and fans: "yes", "no" and "not applicable"

Yes. The architectural design for college is based upon use of natural lighting & ventilation, to save extra power for bulbs and fans.

3.2.2 Whether florescent bulbs are replaced with CFL bulbs/LEDs: "yes", "no" and "not applicable"

Yes. They are replaced by CFL Bulbs or LED Bulbs.

Two Generators in case of Emergency

3.3 Minimize the use of unsustainable transport

3.3.1 What are the available/maximum transport facility used by the staff members/students etc., - mention the number (in average per day):

Two Wheelers- Scooty and Motor Cycle - 80 to 100 (Approx) Four-Wheeler- 2 to 3 (Approx)
Cycle - 100 (Approx)

3.3.2 Whether college has any common car sharing/car pool among the students and faculty: "yes", "no" and "not applicable"

Yes. The faculty members, Students and Non-Teaching Staffs follow common car Sharing or Car pool Method to minimize Air Pollution by vehicular emission.

4 WASTE MANAGEMENT

4.1 Maximization of the process of wastes & minimization of non-renewable refuse

4.1.1 Is there any method of segregation of waste materials? "yes", "no" and "not applicable"

Yes. The method of segregation of waste materials performs in the college campus.

Approximate amount of waste generated per day (in Kilograms/month)

Biodegradable	Non-biodegradable	Hazardous Waste
50 kg	5 kg	1 kg

4.1.2 Total amount of solid waste generated in the campus (including tree droppings & Lawn wastes) 100 kg per month.(Approx)

Total number of staff 142.

Male		Female	Total
Teachers	49	38	87
Students	1612	1665	3277
Non-Teaching Staff(s)	Full timer 15 Adhoc 32	Full timer 02 Adhoc 06	Full timer 17 Adhoc 38

Total	1708	1711	3,419

Per capita production per day 3 to 5 Kg per day.

4.1.3 Whether college arrange any workshop/seminar/conference for awaring the students/staff for specific arrangements for recyclable wastes: "yes", "no" and "not applicable"

Yes. The college arrange workshop/seminar/conference to aware the students/staff for specific arrangements for recyclable wastes.

Eco Club carried out numerous activities viz:

- Recycling campaigns
- Electronic Waste Management
- Anti-plastic campaigns
- Tree plantation Programme
- Sustainable developmental goals and awareness Programme to achieve it.

4.1.4 Whether college follow specific disposal method for solid or liquid waste in specific manner:

"yes", "no" and "not applicable"

Yes,

✓ Composting

Small Composting pits are available in the campus. Vermicomposting is also practiced in small scale for solid biodegradable substance.

✓ Recycling and Reusing

Reuse of one side printed Paper for internal communication

✓ Sewage water is discharged to public Sewer. Domestic Waste is given to Municipal Corporation.

✓ Two types of Waste bins are provided at campus viz: -

a) Biodegradable
b) Non-biodegradable waste

✓ Horticulture waste is also given to Municipal Corporation.

✓ Incinerator is used for managing sanitary waste.

As per new waste management rules all kind of waste is managed in an adequate manner without any deviation.

4.1.5 Whether the recycling/collection facilities are provided by the city Municipality and/or private suppliers (including glass, white plastic bottle, printer cartridges, cardboard, furniture, plastics, thermocol, waste papers, electrical goods & alliances, electronic gadgets, instruments, equipment, packing materials):

"yes", "no" and "not applicable"

Not Applicable.

4.1.6 Whether college has any composting ground/vat or any collection unit etc.: "yes", "no" and "not applicable"
(if yes, what is the percentage of waste undergone composting and the final use of the products)

No, Large Composting ground is not present here. The process of vermicomposting performs in small scale. It is about 5 to 10 % of total biodegradable waste.

4.1.7 Is there any mechanism of treatment/uses of domestic influent in the college campus (if so, what is the capacity of treatment plant/composting etc.): "yes", "no" and "not applicable"

Yes, the treatment or uses of domestic influent in the college campus performs through Composting. Composting pits are available in the campus. Vermicomposting is also practiced. The Capacity of the Vermicomposting Bins 20 Kg.

4.1.8 Minimize use of chemical pollutants

Sl No.	**Dept**	**Name of the waste**			**Total (a+b+c)**	**Characterization(if any)**	**Method of disposal**	**Agency if any**
		Chemical (a)	**Biological waste (b)**	**Microbial waste (c)**				
1	Chemistry	Common chemical wastes used for qualitative and quantitative analysis for inorganic and organic practical.	N/A	N/A	10 Kg (approx /month)	Non-Hazardous	Disposed in Vat	N/A
2	Zoology	Common Chemicals.	Corpse of Cockroaches.	N/A	Negligible	Non-Hazardous	Disposed in Vat	N/A
3	Botany	Common Chemicals.	Leaves & plants residue	N/A	Negligible	Non-Hazardous	Disposed in Vat	N/A

4	Geography	Chemical wastes used for determination & estimation of soil pH, available Phosphate, available Potassium and organic carbon in soil.	N/A	N/A	Negligible	Non-Hazardous	Disposed in Vat	N/A

4.1.9 Records of dustbins/collection bins inside the campus

Sl no.	**Location of dustbin**	**No. of dustbins**			**Quantity of collection (per day)**	**Disposal time**	**Cleaning by ecofriendly product Y/N**
		Biodegradable	**Non-biodegradable**	**Plastic waste**	**Total**		
1	Infront of chemistry Department (Ground floor)	1			B.D- 3 kg N.B.D- 1 kg	Morning 9 A.M	Yes
2	Infront of Room No 116(Ground floor)		1			Same	Yes
3	Infront of Room No 119(Ground floor)	1				Same	Yes
4	Infront of Room No 128(Ground floor)	1				Same	Yes
5	Infront of Zoology Department (Ground floor)		1			Same	Yes
6	Infront of Physics Department (First floor)	1	1			Same	Yes
7	Infront of Room No 201(First floor)					Same	Yes

8	Infront of Teachers Common Room (First floor)	1	1			Same	Yes
9	Infront of Room No 301(Second floor)					Same	Yes
10	Infront of Room No 304(Second floor)	2				Same	Yes
11	Infront of Room No 314 (Second floor)	1				Same	Yes
12	Infront of Seminar Room (Second floor)	1				Same	Yes

4.1.9 Whether the cleaning products used by the college staff are ecofriendly and under the COSHH (Control of Substances Hazard to Health) regulations: "yes", "no" and "not applicable"

Yes. The cleaning products used by the college staffs are ecofriendly.

Whether the college is using fertilizers, pesticides for any purposes, if so, amount used per month and places of uses

Use of public transport: "yes", "no" and "not applicable"

No. The college is not using fertilizers, pesticides for any purposes.

5.E-WASTE MANAGEMENT

5.1 Quantity of e-waste generated:

5.2 Number of cartridges used month-wise:

2 cartridges used.

5.3 Number of cartridges disposed in a year (average):

2 cartridges disposed in a year (average)

5.4 Number of times refilling & reusing method of disposal of e-waste (if any)

Not applicable.

5.5 Whether college has conducted any awareness programme on e-waste management:

"yes", "no" and "not applicable"

Yes. The college has conducted awareness programme on e-waste management.

5.6 Is there any means of disposal of unused computers, printers and electronic wastes through authorized agents: "yes", "no" and "not applicable"

No.

5.7 Disposal methods Not applicable.

Sl No.	Location	Amount of generation	Method of disposal	Name of the Agency (if any) for disposal
	Not applicable			

6. GREEN AREA MANAGEMENT

6.1 Is there any garden in the college campus/outside the campus under college custody: "yes", "no" and "not applicable"

Yes. 65200 Square meter area is under the green coverage.

6.2 Whether the garden is watered by using drip/sprinkler irrigation system: "yes", "no" and "not applicable"

No. The college is trying to establish the methods of advance and modern Irrigation like Sprinkler and Drip Irrigation.

6.3 Is there any mechanism of review of periodical monitoring of tree species: "yes", "no" and "not applicable"

Yes, Review of periodical monitoring of tree species is maintained by the Botany Department.

6.4 Whether the college has taken any programme for plantation of some fruit trees which can attract birds, bees *etc*.
"yes", "no" and "not applicable"

Yes, the college has taken programme for plantation of fruit trees which can attract birds, bees etc.

6.5 Biodiversity Mapping
Name of the place and area: B.C.COLLEGE, ASANSOL

SL. NO.	Type of plantation				Species name	Name of the family	Total number of species
	Indigineous plants	Medicinal plants	Ornamental plants	Exotic plants			
1	Tectona grandis	Pandanus amaryllifolius	Polyalthia longifolia	Swietenia macrophylla	Swietenia macrophylla	Meliaceae	14
2	Dalbergia sisso	Bryophyllum pinnatum	Codiaeum variegatum	Samanea saman	Samanea saman	Fabaceae	1
3	Mangifera indica	Eupatorium triplinerve	Dracena marginata	Peltophorum pterocarpum	Peltophorum pterocarpum	Fabaceae	12
4	Ficus benghalensis	Elettaria cardamomum	Peltophorum pterocarpum		Tectona grandis	Lamiaceae	1
5	Syzygium cumini	Solanum nigrum	Acalypha wilkesiana	Sterculia foetida	Sterculia foetida	Malvaceae	4
6	Annona squamosa	Andrographis paniculata	Ixora finlaysoniana	Polyalthia longifolia	Dalbergia sisso	Fabaceae	6
7	Mimusops elengi	Sansevieria roxburghiana	Trema orientalis	Acalypha wilkesiana	Mangifera indica	Anacardiaceae	15
8	Ficus religiosa	Bacopa monnieria	Tabernaemontana divericata	Ixora finlaysoniana	Ficus benghalensis	Moraceae	1
9	Kalanchoe pinnata	Euphorbia tirucalli	Cordyline fruticosa	Cinnamomum camphora	Syzygium cumini	Myrtaceae	6
10	Tabernaemontana divericata	Ocimum tenuiflorum	Bauhinia variegata	Mussaenda erythophylla	Annona squamosa	Annonaceae	2
11	Terminalia catappa	Sansevieria cylindrica	Thuja orientalis	Thuja orientalis	Mimusops elengi	Sapotaceae	1
12	Adenanthera pavonina	Murraya Koemigii	Hibiscus rosa-sinensis	Gardenia jasminoides	Ficus religiosa	Moraceae	2
13	Ficus virens	Aerva javanica	Gardenia jasminoides	Nerium oleander	Polyalthia longifolia	Annonaceae	12

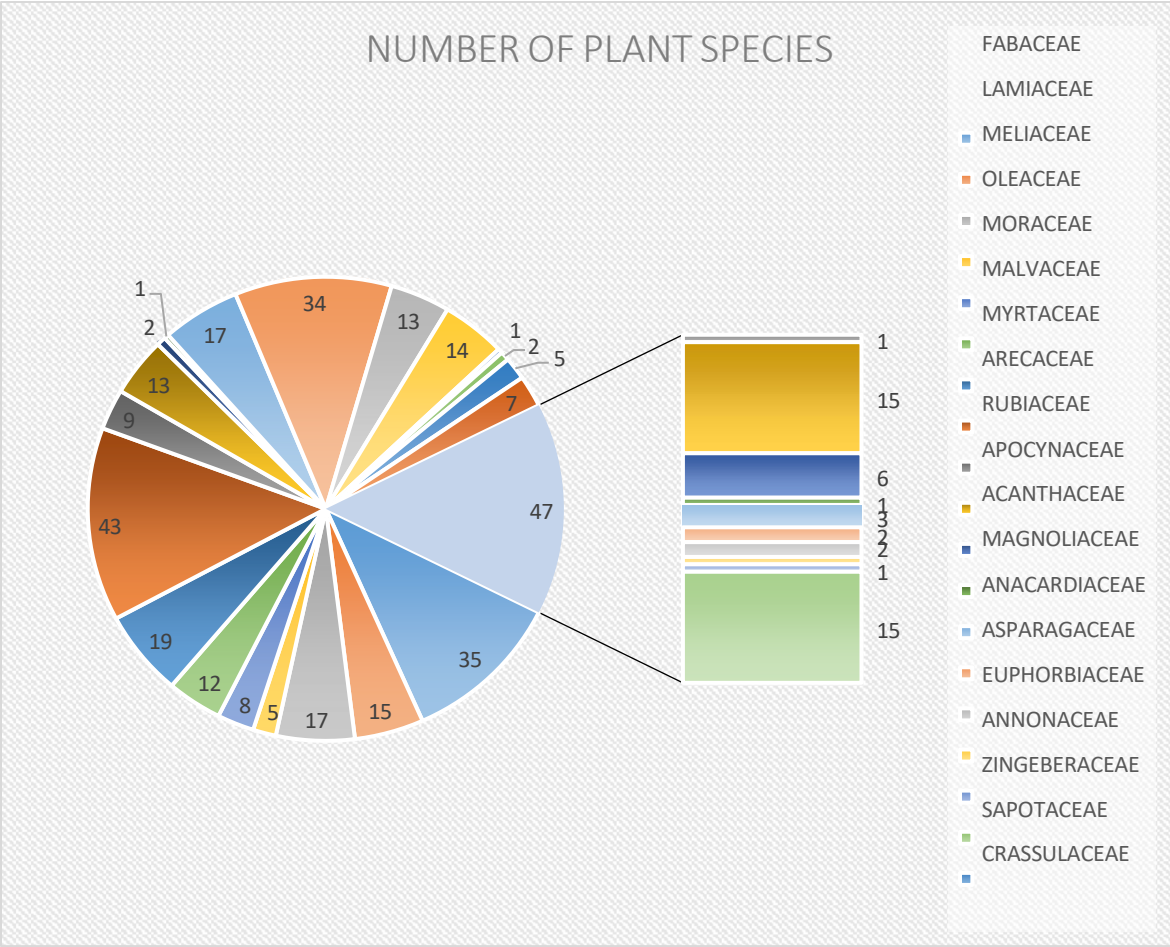
14	Bridelia retusa	Euphorbia antiquorum	Nerium oleander	Ixora coccinea	Codiaeum variegatum	Euphorbiaceae	8
15	Pterospermum acerifolium	Centella asiatica	Ixora coccinea	Hyophorbe lagenicaulis	Dracena marginata	Asparagaceae	24
16	Elaeocarpus ganitrus	Curcuma amada	Hyophorbe lagenicaulis	Duranta erecta	Kalanchoe pinnata	Crassulaceae	5
17	Bauhinia variegata	Withania sommifera	Albizia lebbeck	Plumeria rubra	Acalypha wilkesiana	Euphorbiaceae	4
18	Hibiscus rosa-sinensis	Coleus amboinicus	Saraca asoca	Rosa sp	Ixora finlaysoniana	Rubiaceae	1
19	Psidium guajava	Cymbopogon flexuosus	Murraya paniculata	Dypsis lutescens	Trema orientalis	Tiliaceae	7
20	Acacia auriculiformis	Cissus quadrangularis	Combretum indicum	Eucalyptus globulus	Tabernaemontana divericata	Apocynaceae	6
21	Azadirachta indica	Aloe vera	Duranta erecta		Cinnamomum tamala	Lauraceae	1
22	Bauhinia acuminata	Asparagus adscendens	Magnolia champaca		Cordyline fruticosa	Asparagaceae	10
23	Albizia lebbeck	Sauropus androgynus	Plumeria rubra		Terminalia catappa	Combretaceae	1
24	Saraca asoca	Datura stramonium	Rosa sp		Adenanthera pavonina	Fabaceae	1
25	Phyllanthus emblica	Catharanthus roseus	Jasminum sambac		Ficus virens	Moraceae	1
26	Justicia adhatoda	Plumbago zeylanica	Dypsis lutescens		Bridelia retusa	Phyllanthaceae	1
27	Combretum indicum	Clerodendrum indicum	Nymphaea nouchali		Pterospermum acerifolium	Sterculiaceae	2
28	Trophis aspera	Tylophora indica	Nyctanthes arbor-tristis		Elaeocarpus ganitrus	Elaeocarpaceae	1
29	Artocarpus heterophyllus	Mimosa pudica			Cinnamomum camphora	Lauraceae	1
30	Aegle marmelos	Crinum asiaticum			Mussaenda erythophylla	Rubiaceae	1
31	Areca catechu	Euphorbia nerifolia			Bauhinia variegata	Caesalpiniaceae	1
32	Cocos nucifera	Stevia rebandiana			Thuja orientalis	Cupressaceae	15
33	Neolamarckia kadamba	Ambroma augusta			Hibiscus rosa-sinensis	Malvaceae	8
34	Murraya paniculata	Hemidesmus indicus			Psidium guajava	Myrtaceae	9
35	Spondias pinnata	Hedychium coronarium			Gardenia jasminoides	Rubiaceae	1
36	Manilkara japota	Acorus calamus			Nerium oleander	Apocynaceae	4
37	Magnolia champaca	Belamcanda chinensis			Ixora coccinea	Rubiaceae	5
38	Jasminum sambac	Kaempferia galanga			Acacia auriculiformis	Fabaceae	10
39	Ficus hispida	Costus pictus			Azadirachta indica	Meliaceae	3
40	Ocimum tenuiflorum	Kalanchoe pinnata			Hyophorbe lagenicaulis	Arecaceae	33
41	Ocimum sanctum	Adina cordifolia			Bauhinia acuminata	Fabaceae	3
42	Nymphaea nouchali	Saraca asoca			Albizia lebbeck	Fabaceae	2
43	Cleistanthus collinus	Buchanania lanzan			Saraca asoca	Fabaceae	1

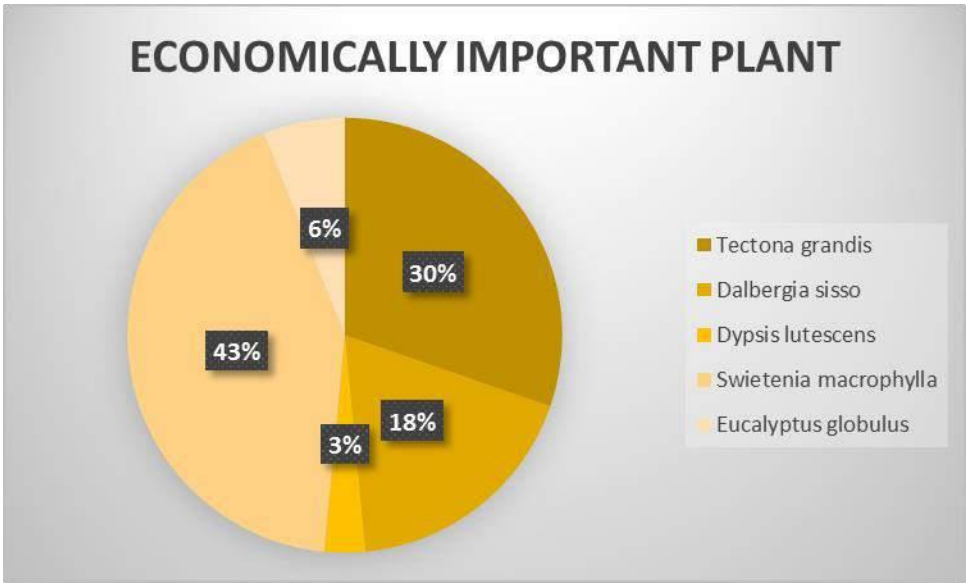
44	Nyctanthes arbor-tristis	Pterocarpus marsupium			Phyllanthus emblica	Phyllanthaceae	2
45	Curcuma longa	Stereospermum suaveolens			Justicia adhatoda	Acanthaceae	2
46		Terminalia arjuna			Combretum indicum	Combretaceae	1
47		Terminalia bellerica			Trophis aspera	Moraceae	3
48		Terminalia chebula			Artocarpus heterophyllus	Moraceae	1
49		Zephyranthes grandiflora			Aegle marmelos	Rutaceae	1
50		Allium tuberosum			Areca catechu	Arecaceae	7
51		Shorea robusta			Cocos nucifera	Arecaceae	3
52		Costus speciosus			Neolamarckia kadamba	Rubiaceae	1
53		Santalum album			Murraya paniculata	Rutaceae	3
54		Aegle marmelos			Spondias pinnata	Anacardiaceae	2
55		Azadirachta indica			Duranta erecta	Verbenaceae	15
56		Emblica officinalis			Manilkara japota	Sapotaceae	1
57		Pimenta dioica			Pimenta dioica	Myrtaceae	2
58		Cinnamomum tamala			Magnolia champaca	Magnoliaceae	1
59		Elaeocarpus ganitrus			Plumeria rubra	Apocynaceae	3
60		Justicia adhatoda			Rosa sp	Rosaceae	6
61		Magnolia champaca			Jasminum sambac	Oleaceae	1
62		Jasminum sambac			Ficus hispida	Moraceae	1
63		Eucalyptus globulus			Dypsis lutescens	Arecaceae	14
64		Ocimum tenuiflorum			Eucalyptus globulus	Myrtaceae	2
65		Ocimum sanctum			Ocimum tenuiflorum	Lamiaceae	8
66		Nymphaea nouchali			Ocimum sanctum	Lamiaceae	6
67		Cleistanthus collinus			Nymphaea nouchali	Nymphaeceae	1
68		Nyctanthes arbor-tristis			Cleistanthus collinus	Euphorbiaceae	1
69		Curcuma longa			Nyctanthes arbor-tristis	Oleaceae	4
70					Curcuma longa	Zingiberaceae	1
71					Pandanus amaryllifolius	Pandanaceae	8
72					Bryophyllum pinnatum	Crassulaceae	10
73					Eupatorium triplinerve	Asteraceae	12

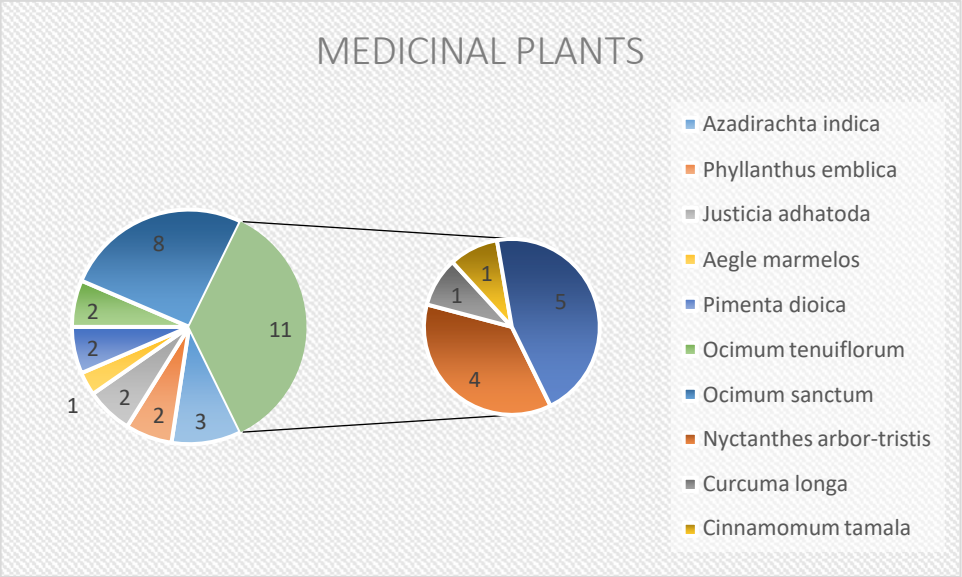
74					Elettaria cardamomum	Zingiberaceae	10
75					Solanum nigrum	Solanaceae	10
76					Andrographis paniculata	Acanthaceae	10
77					Sansevieria roxburghiana	Asparagaceae	10
78					Bacopa monnieria	Plantaginaceae	10
79					Euphorbia tirucalli	Euphorbiaceae	10
80					Ocimum tenuiflorum	Lamiaceae	7
81					Sansevieria cylindrica	Asparagaceae	12
82					Murraya Koemigii	Rutaceae	12
83					Aerva javanica	Amaranthaceae	12
84					Euphorbia antiquorum	Euphorbiaceae	12
85					Centella asiatica	Apiaceae	8
86					Curcuma amada	Zingiberaceae	14
87					Withania sommifera	Solanaceae	24
88					Coleus amboinicus	Lamiaceae	12
89					Cymbopogon flexuosus	Poaceae	10
90					Cissus quadrangularis	Vitaceae	12
91					Aloe vera	Xanthorrhoeaceae	12
92					Asparagus adscendens	Asparagaceae	10
93					Sauropus androgynus	Phyllanthaceae	10
94					Datura stramonium	Solanaceae	10
95					Catharanthus roseus	Apocynaceae	10
96					Plumbago zeylanica	Plumbaginaceae	10
97					Clerodendrum indicum	Lamiaceae	10
98					Tylophora indica	Apocynaceae	10
99					Mimosa pudica	Fabaceae	10
100					Crinum asiaticum	Amaryllidaceae	10
101					Euphorbia nerifolia	Euphorbiaceae	10
102					Stevia rebandiana	Asteraceae	8
103					Ambroma augusta	Malvaceae	5
104					Hemidesmus indicus	Apocynaceae	10

105					Hedychium coronarium	Zingiberaceae	10
106					Acorus calamus	Acoraceae	10
107					Belamcanda chinensis		10
108					Kaempferia galanga	Zingiberaceae	10
109					Costus pictus	Costaceae	10
110					Kalanchoe pinnata	Crassulaceae	10
111					Adina cordifolia	Rubiaceae	1
112					Saraca asoca	Fabaceae	2
113					Buchanania lanzan	Anacardiaceae	1
114					Pterocarpus marsupium	Fabaceae	2
115					Stereospermum suaveolens	Bignoniaceae	2
116					Terminalia arjuna	Combretaceae	2
117					Terminalia bellerica	Combretaceae	2
118					Terminalia chebula	Combretaceae	2
119					Zephyranthes grandiflora	Amaryllidaceae	10
120					Allium tuberosum	Amaryllidaceae	10
121					Shorea robusta	Dipterocarpaceae	3
122					Costus speciosus	Costaceae	10
123					Santalum album	Santalaceae	6
124					Syzygium samarangense	Myrtaceae	1
125					Averrhoa carambola	Oxalidaceae	1
126					Carissa carandas	Apocynaceae	1

Biodiversity Calculator







MEMBERS OF OUR GREEN CAMPUS

Sidar hombifolia

Phyllanthus niruri

Catharanthus roseus

Duranta repens

Swietenia mahagoni

Euphorbia hirta

Gardenia jasminoides

Bauhinia acuminata

Alternanthe rasessilis

Tridax procumbens

Oldenlandia corymbosa

Tabernaemontana divaricate

Murraya paniculata

Polyalthia longifolia

Ruellia tuberosa

Saraca asoca

Tectona grandis

LIST OF TREES

SL NO.	BOTANICAL NAME	FAMILY
1	Swietenia macrophylla	Meliaceae
2	Samaneasaman	Fabaceae
3	Peltophorumpterocarpum	Fabaceae
4	Tectona grandis	Lamiaceae
5	Sterculiafoetida	Malvaceae
6	Dalbergiasisso	Fabaceae
7	Mangifera indica	Anacardiaceae
8	Ficusbenghalensis	Moraceae
9	Syzygiumcumini	Myrtaceae
10	Annona squamosa	Annonaceae
11	Mimusopselengi	Sapotaceae
12	Ficus religiosa	Moraceae
13	Polyalthialongifolia	Annonaceae
14	Adenantherapavonina	Fabaceae
15	Ficus virens	Moraceae
16	Brideliaretusa	Phyllanthaceae
17	Pterospermumacerifolium	Sterculiaceae
18	Elaeocarpusganitrus	Elaeocarpaceae
19	Psidium guajava	Myrtaceae
20	Gardenia jasminoides	Rubiaceae
21	Acacia auriculiformis	Fabaceae
22	Azadirachtaindica	Meliaceae
23	Hyophorbelagenicaulis	Arecaceae
24	Albizialebbeck	Fabaceae
25	Saracaasoca	Fabaceae
26	Phyllanthusemblica	Phyllanthaceae
27	Trophisaspera	Moraceae
28	Artocarpus heterophyllus	Moraceae
29	Aegle marmelos	Rutaceae
30	Areca catechu	Arecaceae
31	Cocos nucifera	Arecaceae
32	Neolamarckiakadamba	Rubiaceae
33	Spondiaspinnata	Anacardiaceae

34	Manilkarajapota	Sapotaceae
35	Magnolia champaca	Magnoliaceae
35	Magnolia champaca	Magnoliaceae
36	Plumeria rubra	Apocynaceae
37	Ficushispida	Moraceae
38	Eucalyptus globulus	Myrtaceae

LIST OF HERBS		
SL.NO.	**BOTANICAL NAME**	**FAMILY**
1	Acalypha indica	Euphorbiaceae
2	Achyranthes aspera	Amaranthaceae
3	Ageratum conyzoides	Asteraceae
4	Alternantheraphiloxeroides	Amaranthaceae
5	Alternantherasessilis	Amaranthaceae
6	Amaranthusviridis	Amaranthusviridis
7	Andrographispaniculata	Acanthaceae
8	Blumealacera	Asteraceae
9	Catharanthus roseus	Apocynaceae
10	Cleome rutidosperma	Capparidaceae
11	Commelinabenghalensis	Commelinaceae
12	Cynodondactylon	Poaceae
13	Cyperusrotundus	Cyperaceae
14	Ecliptaprostrata	Asteraceae
15	Eleusine indica	Poaceae
16	Eragrostistenella	Poaceae
17	Kyllingamonocephala	Cyperaceae
18	Ocimum sanctum	Lamiaceae
19	Oldenlandiacorymbosa	Rubiaceae
20	Peperomia pellucida	Piperaceae
21	Ruelliatuberosa	Acanthaceae
22	Phyllanthusniruri	Phyllantheceae
23	Euphorbia hirta	Euphorbiaceae
24	Lindenbergiaindica	Scrophulariaceae
25	Scoparia dulcis	Scrophulariaceae
26	Solanum nigrum	Solanaceae
27	Vandelliacrustacea	Scrophulariaceae
28	Vernoniacineria	Asteraceae

LIST OF SHURBS

SL. NO.`	BOTANICAL NAME	FAMILY
1	Ixora coccinea	Rubiaceae
2	Lantana camara	Verbenaceae
3	Sidaacuta	Malvaceae
4	Sidarhombifolia	Malvaceae
5	Sidaacuta	Malvaceae
6	Tabernaemontanadivaricata	Apocynaceae
7	Nerium indicum	Apocynaceae
8	Adhatodavasica	Acanthaceae
9	Hibiscus rosa-sinensis	Malvaceae

PLANT SURVEY

Scientific Name	Local Name	Family	Numbers
Swietenia macrophylla	Mahogany	Meliaceae	14
Samaneasaman	Khirish, Rain Tree	Fabaceae	1
Peltophorumpterocarpum	Radhachura	Fabaceae	12
Tectonagrandis	Shagun	Lamiaceae	1
Sterculiafoetida	Bakshabadam	Malvaceae	4
Dalbergiasisso	Sisso	Fabaceae	6
Mangifera indica	Aam	Anacardiaceae	15
Ficusbenghalensis	Bot	Moraceae	1
Syzygiumcumini	Jam	Myrtaceae	6
Annona squamosa	Aata	Annonaceae	2
Mimusopselengi	Bakul	Sapotaceae	1
Ficus religiosa	Peepul	Moraceae	2
Polyalthialongifolia	Debdaru	Annonaceae	12
Codiaeum variegatum	Garden Croton	Euphorbiaceae	8
Dracenamarginata	Dragon tree	Asparagaceae	24
Kalanchoe pinnata	Pathorkuchi	Crassulaceae	5
Acalyphawilkesiana	Curly Acalypha	Euphorbiaceae	4
Ixorafinlaysoniana	Sadarongon	Rubiaceae	1
Tremaorientalis	Chikan, Indian nettle tree	Tiliaceae	7
Tabernaemontanadivericat a	Tagor	Apocynaceae	6
Cinnamomumtamala	Tejpata	Lauraceae	1
Cordylinefruticosa	Baby doll Ti plant	Asparagaceae	10
Terminalia catappa	Indian almond	Combretaceae	1
Adenantherapavonina	Raktachandan	Fabaceae	1
Ficus virens	Pakur	Moraceae	1
Brideliaretusa	Kosoi, Gilo, Kuhir	Phyllanthaceae	1
Pterospermumacerifolium	Muchkund, Muskanda	Sterculiaceae	2

Elaeocarpusganitrus	Rudraksha	Elaeocarpacea e	1
Cinnamomumcamphora	Camphor Tree	Lauraceae	1
Mussaendaerythophylla	Mussaenda	Rubiaceae	1
Bauhinia variegata	Raktakanchan	Caesalpiniacea e	1
Thujaorientalis	Mandirjhau	Cupressaceae	15
Hibiscus rosa-sinensis	Jaba	Malvaceae	8
Psidium guajava	Peyara	Myrtaceae	9
Gardenia jasminoides	Gardenia	Rubiaceae	1
Nerium oleander	Karabi	Apocynaceae	4
Ixora coccinea	Lal rangan	Rubiaceae	5
Acacia auriculiformis	Akashmoni	Fabaceae	10
Azadirachtaindica	Neem	Meliaceae	3
Hyophorbelagenicaulis	Bottle palm	Arecaceae	33
Bauhinia acuminata	Sadakanchan	Fabaceae	3
Albizialebbeck	Sirish	Fabaceae	2
Saracaasoca	Ashoka	Fabaceae	1
Phyllanthusemblica	Amloki	Phyllanthaceae	2
Justiciaadhatoda	Basak	Acanthaceae	2
Combretum indicum	Madhobilata	Combretaceae	1
Trophisaspera	Sheora	Moraceae	3
Artocarpusheterophyllus	Kathal	Moraceae	1
Aegle marmelos	Bel	Rutaceae	1
Areca catechu	Supari	Arecaceae	7
Cocos nucifera	Narkel	Arecaceae	3
Neolamarckiakadamba	Kadam	Rubiaceae	1
Murrayapaniculata	kamini	Rutaceae	3
Spondiaspinnata	Aamra	Anacardiaceae	2
Durantaerecta	Duranta	Verbenaceae	15
Manilkarajapota	Sabeda	Sapotaceae	1
Pimentadioica	Allspice	Myrtaceae	2
Magnolia champaca	Swarnochampa	Magnoliaceae	1
Plumeriarubra	Frangipani	Apocynaceae	3
Rosa sp	Rose	Rosaceae	6
Jasminumsambac	Beli	Oleaceae	1
Ficushispida	Dumur	Moraceae	1
Dypsislutescens	Areca palm	Arecaceae	14
Eucalyptus globulus	Eucalyptus	Myrtaceae	2
Ocimumtenuiflorum	Krishna tulsi	Lamiaceae	8
Ocimum sanctum	Tulsi	Lamiaceae	6
Nymphaea nouchali	Lal shaluk	Nymphaeceae	1
Cleistanthuscollinus	Parashi	Euphorbiaceae	1
Nyctanthesarbor-tristis	Shuili	Oleaceae	4
Curcuma longa	Halud	Zingiberaceae	1

ANIMAL SURVEY

Acraea terpsicore

- **List of Annelids found in the College Campus**

1. *Eiseniafetida* (Common Name: Red Wigglers)
2. *Perionyx excavates*
3. *Phertima sp.*

- **List of Arthropods found in the College Campus**

1. *Rhysida* sp. (Common Name: Common Centiped)
2. *Scolopendra* sp.
3. *Periplaneta* sp.
4. Family: Scutelleridae (Common Name: Jewel Bug)
5. Family: Coccinellidae (Common Name: Lady Bird Beetles)
6. *Culex* sp.
7. *Aedes* sp.
8. Chironomous Larva
9. *Musca domesticus*
10. Family: Scutelleridae
11. Millipeds
12. *Apis*sp.
13. *Cyclops sp.*
14. *Mantis sp.*
15. *Macrotermes*
16. *Papiliodemodocus (Lime Butterfly)*
17. *Junoniaatlites (Grey Pansy)*
18. *Appiasolferna (Black veined albatross)*
19. *Euremahecabe (Common grass yellow butterfly)*
20. *Diplacodestrivialis (Ground skimmer butterfly)*
21. *Acraea terpsicore (Tawny Coaster)*

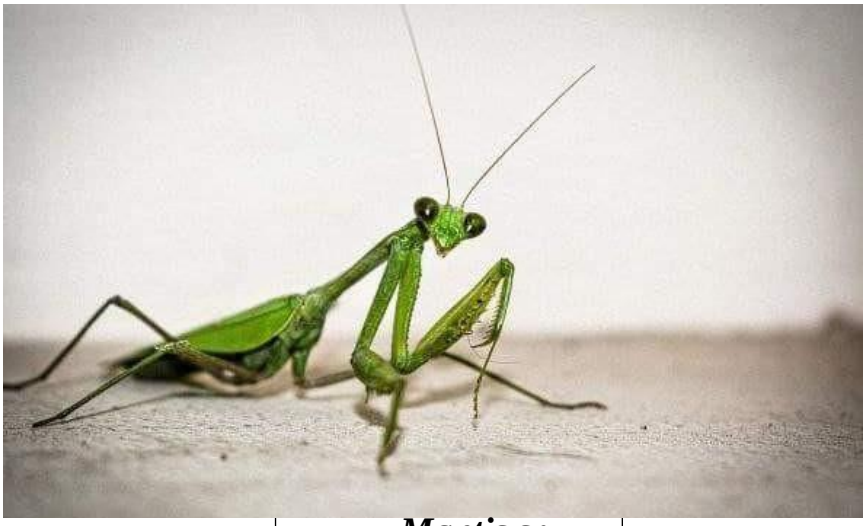
22. *Kalidasalanata*
23. *Tutubing kalabaw*
24. *Ceriagrioncoromandelianum*
25. *Crocothemis servilia*

Photographs of a few arthropods at B.C.College campus

Tutubing kalabaw

Crocothemis servilia

Ceriagrion coromandelianum



Mantis sp.

List of Molluscs found in the College Campus

1. *Pila sp*
2. *Achatina sp.*

List of Amphibia Found in the college Campus:

1. *Bufo sp.*
2. *Rana sp.*

List of Reptiles found in the College Campus

1. *Vipera sp.*
2. *Fowleapiscaletor*
3. *Calotes versicolor*
4. *Chamaeleozeylanicus*
5. *Amphiesmastolatum*
6. *Oligodonarnensis*
7. *Ahaetullanasuta*
8. *Hemidactylus*

Photographs of Reptile at B.C.College campus

Calotes versicolor

List of Aves found in the College Campus

1. *Columba sp.*
2. *Pycnonotus sp.*
3. *Psittacula sp.*
4. *Passer sp.*
5. *Corvus sp.*
6. *Eudynamys sp.*
7. *Centropus*
8. *Acridotheres*
9. *Spilopelia*
10. *Turdoides*
11. *Cinnyris*
12. *Bubo*
13. *Dicurus*
14. *Upupa*
15. *Copsychus*
16. *Hoopoe*

Photographs of a few birds at B.C.College campus

Dicurus sp.

Hoopoe sp.

Acridotheres tristis

Acridotheres ginginianus

Pycnonotus sp.

Copsychus sp.

List of Mammals found in the College Campus

1. *Canis sp.*
2. *Felis sp.*
3. *Funumbulus sp.*
4. *Rattus norvegicus*
5. *Sorex sp.*

Funumbulus sp.

Discussion: The campus of Bidhan Chandra College is rich in faunal biodiversity. The arthropod biodiversity as well as avian biodiversity of this campus is very high which is due to abundance of a lot of trees within the campus. The interaction of the flora and fauna within the campus are depicted in most of the pictures attached with this report.

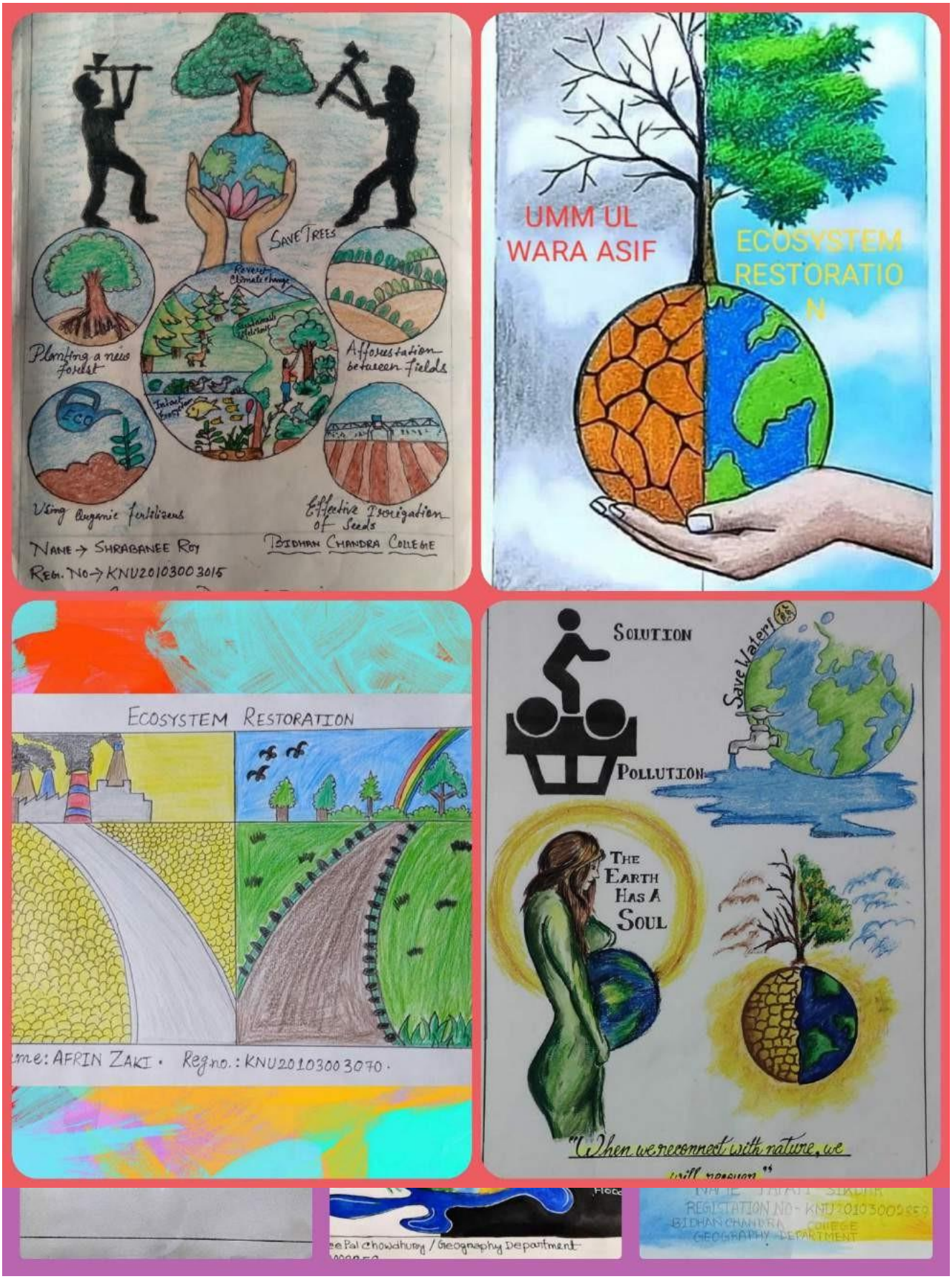
Reference

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- K.A Subramanian. Dragon flies and Dansel flies of Peninsular India, a field guide(ed.1.0) project life scape PP12 to 35, 2005
- Richards, O.W, Davies, R.G(1977) Imms' General text book of Entomology. Chapman and Hall.
- Peter Stilling Ecology book.
- Elements of ecology by Robert's Smith
- Wikipedia
- For identification – Medicinal plant resources of South Bengal.

Identify.plantnet.org flowersofindia.net

- Energy Conservation Act 2010
- Energy Conservation Rule 1956 (Amended 2006)


SOLAR
ALTERNATIVE ENERGY RESOURCES
GEOTHERMAL
ACID RAIN
Name : Shabahat Perween
Reg. NO : KNU20103003998
Department : Geography
STOP
Ecosystem Restoration
LET US RESTORE ECO-SYSTEM
THE EARTH IS WHAT WE ALL HAVE IN COMMON!
Name : Naaz Perween
Reg.No. : KNU20103003997
Department : Geography
SAVE THE EARTH
Global Warming
West Antacita has losing ice 60% faster to global warming
STOP Global Warming
ECOSYSTEM RESTORATION
NAME - TAPATI SIKDAR


Save Trees
Reverse Climate change
Planting a new forest
Afforestation between fields
Using Organic fertilizers
Effective Irrigation of Seeds
NAME → SHRABANEE ROY
REG. NO → KNU2010300 3015
BIDHAN CHANDRA COLLEGE
UMM UL WARA ASIF
ECOSYSTEM RESTORATIO N
ECOSYSTEM RESTORATION
me: AFRIN ZAKI · Reg no.: KNU2010300 3070 ·
SOLUTION
POLLUTION
Save Water!
THE EARTH HAS A SOUL
"When we reconnect with nature, we
ee Pal Chowdhury / Geography Department
REGISTATION NO - KNU2010300
BIDHAN CHANDRA COLLEGE
GEOGRAPHY DEPARTMENT


WORLD EARTH DAY
NATIONAL SERVICE SCHEME
B.C COLLEGE


DEFEND AGAINST DENGUE
STOP DENGUE