

**Green Audit Report
of
KRISHNAGAR WOMEN'S COLLEGE**



2022-2023

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Aurobindo Sarani, Krishnagar, Nadia – 741 101.

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EXECUTIVE SUMMARY

Rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the green campus for the institute which will lead for sustainable development. Krishnagar Women's College is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher studies, the college has initiated 'The Green Campus' programme is conducted every year which activity promotes various project for environmental protection and sustainability.

Purpose of this audit is to ensure that the practices followed in the campus are in accordance with the green policy adopted by the institution, it works on several facets of Green Campus including water conservation, electricity conservation, tree plantation, waste management, paperless work, mapping of biodiversity etc. With this in mind, specific objectives of the audit is to evaluate 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. It can make a tremendous impact on students' health and learning, college operational costs and the environment. The criteria methods and recommendations used in the audit were based on the identified risks.

Sonar Dharat Environment & Ecology Pvt. Ltd.

Paximal Sarkar

Director

CHAPTER - 1

INTRODUCTION

1.1 Green Audit

Environmental or Green Audit is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices adopted to meet the environmental requirements (EPA, 2003). In other words, it is a management tool, comprising of systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with Institutional policies, which would include regulatory requirements and standards applicable.

Environmental auditing is essentially an environmental management tool for re assuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties.

Considering the present environmental problems of pollution and excessive use of natural resources, Honorable Prime Minister, Shri. Narendra Modi has declared the Mission of Swachh Bharat Abhiyan. Also, College Grants Commission has mentioned the "Green Campus, Clean Campus" mission mandatory for all higher educational institutes. 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.

1.2 Why Green Audit

- To ensure that the performance of the institution with respect to environmental activities is in compliance with existing laws and regulations.
- To check the functionality and their operating success including water supply, energy related matters and other similar matters that are related to green operations in the campus
- To formulate or update the institution's environmental policy.
- To measure the environmental impact of operational process related to green activities in the campus.
- To measure the performance of each green related operations and actions in the campus.
- To generate a data base of green activities for continuous monitoring to assess the success of each of them.
- To identify future potential liabilities.
- To align the institution's developmental and day to day activities with the stated vision, mission, strategies.
- To identify possible ways to reduce expenditure and running costs on equipments, appliances, etc. or try to enhance revenue income.

1.3 Goals of Green Audit

College has conducted a green audit with specific goals as:

- Assess facility of different types of waste management.
- Increase environmental awareness through out campus.
- Identification and documentation of green practices followed by College.
- Identify strengths and weaknesses in green practices.
- Conduct a survey to know the ground reality about green practices.
- Analyze and suggest solutions for problems identified from the survey.
- Identify and assess environmental risk.

- The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues.

- To motivate staff for optimized sustainable use of available resources.

1.4 Objective of Green Audit

The general objective of green audit is to prepare a baseline report on biodiversity and other resources, measures to mitigate resource wastage and improve resource quality and sustainable practices. The specific objectives are:

- To prepare a checklist of flora and fauna diversity in and around the college campus.
- To suggest measures to improve biodiversity with in the college campus.
- To monitor the energy consumption pattern of the college.
- To assess the quantity of water usage within the college campus.
- To suggest sustainable energy usage and water conservation practices.
- To find out various sources of organic and solid waste generation and mitigation possibilities.
- To inculcate values of sustainable development practices through green audit mechanism.

1.5 About Criteria VII of NAAC

National Assessment and Accreditation Council (NAAC) is a self-governing organization that rated the institutions according to the scores assigned at the time of accreditation of the institution. Green Audit has become a mandatory procedure for educational institutes under Criterion VII of NAAC. The intention of the green audits is to upgrade the environmental condition inside and around the institution. It is performed by considering environmental parameters like water and wastewater accounting, energy conservation, waste management, air, noise monitoring, etc. for making the institution eco-friendlier.

Students are the major strength of any academic institution. Practicing green action in any educational institution will inculcate the good habit of caring for natural resources in students. Many environmental activities like plantation and nurturing saplings and trees, Cleanliness drives, no vehicle day, Rainwater harvesting, etc. will make the students good citizens of the country. Through Green Audit, higher educational institutions can ensure that they contribute towards the reduction of global warming through Carbon Foot print reduction measures.

1.6 Benefit of Green Audit to an Educational Institute

There are many advantages of green audit to an Educational Institute.

- It would help to protect the environment in and around the campus.
- Recognize the cost-saving methods through waste minimization and energy conservation.
- Empower the organization to frame a better environmental performance.
- It portrays a good image of the institution through its clean and green campus.
- More efficient resource management.
- To create a green campus.

- To enable waste management through reduction of waste generation, solid and waste.
- To create plastic-free campus and evolve health consciousness among the Stake holder.

- Recognize the cost-saving methods through waste minimizing and managing.
- Authenticate conformity with the implemented laws.
- Empower the organizations to frame a better environmental performance.
- Enhance the alertness for environmental guidelines and duties.

- Impart environmental education through systematic environmental management approach and Improving environmental standards.

- Bench marking for environmental protection initiatives.
- Financial savings through a reduction in resource use.

- Development of ownership, personal and social responsibility for the College and its environment.

- Developing an environmental ethic and value systems in youngsters.

- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the College.

- Finally, it will help to build a positive impression through green initiatives for the up coming NAAC visit.

1.7 Introduction of Auditing Firm

Name of Firm	M/s. Sonar Bharat Environment & Ecology (P) Ltd.
Address	35, C. R. Avenue, 3 rd floor, Kolkata - 700012.
Contact Details	033-40031179/033-22113034

Details of Team Member

Sr. No.	Name	Designation/ Technical	Technical Experience /Qualification
1	Shri Parimal Sarkar	Legal Expert	<ul style="list-style-type: none">➤ M.Sc. in Disaster Management➤ Post Graduate Diploma in Environmental Law from National Law School, Bangalore➤ Lead Auditor in ISO 14000 (Environmental Management)
2	Shri Subrata De Sarkar	General Manager	<ul style="list-style-type: none">➤ General Manager in Central Public Sector undertaking.➤ 12 years experience in Environmental Auditing➤ Lead Auditor in ISO 50001:2011

List of Experts

Sl. No.	Name	Designation/Qualification	Experience
1	Shri Suvra Majumdar	<ul style="list-style-type: none"> ➤ Post Graduate Diploma in Energy Management (MBA) ➤ B.Tech (Electrical Engineering) 	<ul style="list-style-type: none"> ➤ 15 years experience of Energy audit
2	Shri Gautam Ghosh	<ul style="list-style-type: none"> ➤ Diploma in Mechanical & Electrical Engineering from Calcutta Technical School 	<ul style="list-style-type: none"> ➤ 27 Years experience of working in electrical engineering department in different industries. ➤ 12 years experience in independent electrical auditing
3	Shri Suman Chattaraj	Environmental Specialist	<ul style="list-style-type: none"> ➤ M.Tech in Environmental Science ➤ 20 years experience in Environmental Impact Studies and Auditing
4	Amit Poddar	<ul style="list-style-type: none"> ➤ Diploma in Industrial Safety, M.Sc. Biotechnology from Berhampur College 	<ul style="list-style-type: none"> ➤ 27 years experience of working in Industrial Area.
5	P. K. Koley	<ul style="list-style-type: none"> ➤ M.Tech in "Safety and Occupational Health" from BESU (now IEST) 	<ul style="list-style-type: none"> ➤ 30 years experience of working in BPCL.

1.8 List of Instruments Energy Audit

Following are the instrument used at the time of the Energy Audit.

Sr.	Instrument	Make/Sr.No.
1	Digital LUX Meter	HTC/2222600
2	Digital Micro OHM Meter	Innova/l-259
3	Digital Multi Meter	KusamMeco/162180630
4	Digital Clampmeter	Waco/1910149152
5	Meger	Waco/307421
6	Load analyser	Waco/2954563

1.9 List of Laboratory Instruments for Environmental Monitoring

SL. NO.	NAME OF EQUIPMENT	MAKE	MODEL
1	GAS CHROMATOGRAPH WITH FID, TSD.	VARIAN	CP3800
2	GAS CHROMATOGRAPH MASS SPECTROMETER WITH ECD	VARIAN	CP 3800 SATURN 2200
3	GAS CHROMA TOGRAPH WITH FID for Air	DANI	Master GC
4	ION CHROMATOGRAPH	Thermo Fisher Scientific	DIONEXICS 1100
5	H.P.L.C.	VARIAN	SERIES 200
6	FTIR	Thermo Fisher Scientific	Nicolet IS10
7	ATOMIC ABSORPTION SPECTRROPHOTOMETER	VARIAN	AA 2406TA 120
8	MERCURY ANALYSER	EC	MAS 5840
9	FLAME PHOTOMETER	LOWERENCE & MAYO	381
10	SPECTRO PHOTOMETER	VARIAN	CARY 50
11	BOD INCUBATOR	MULTISPAN	DIGITAL
12	ELECTRONIC MICRO BALANCE	Citizen	CMSF

1.10 List of Field Equipment in Environment Department

Sl. No.	Name of Equipment	Make	Model
1	Field Dust Sampler	Envirotech/LataEnvirotech	APM – 550, PM 2.5 & 10
2	Respirable Dust Sampler	Envirotech/LataEnvirotech	APM-460BL
3	Stack Kit Sampler	Envirotech/LataEnvirotech	APM-620, PM-602
4	Sound Level Meter (AUTOMEDTIC)	Envirotech	SLM-101
5	Sound Level Meter	Lutron	SLM-4001
6	Local Air Quality Sampler	Vayubodhan	APM-414
7	Auto Metric Weather Monitor	Spectrum Technology	WM-272
8	Depth Sampler	NA	NA

1.11 General steps involved in Green Audit

- a) Systematic and exhaustive data collection.
- b) Evidence based documentation of activities.
- c) Regular monitoring.
- d) Provide standards and methods for improvement by establishing cost effective green action plan.

CHAPTER – 2

KRISHNAGAR WOMEN'S COLLEGE

2.1 History of the College

Krishnagar Women's College was first affiliated to Calcutta University and it came under the aegis of Kalyani College in 2000. The College has been accredited by NAAC first with a grade of B++ and with a B+ in its second cycle.

The College founded in 1958, owes its inception to the influx of women from erstwhile East Pakistan who were in need of education after India wins back its freedom. The urge felt by the educated circle of Krishnagar led to the establishment of this one and only College for women in the district that initially started its academic journey in Krishnagar Government College and then shifted to an old building located in Basanta Chatterjee Lane. Soon, the construction of the present College building started with the financial assistance from West Bengal Government under the able leadership of its first founder Principal, Professor Dipti Bose. Since then the College is marching forward with the sole intention to impart quality education to a cross-section of women most of whom are first-generation learners and hail from the marginalized section of society.

The Institution has a number of infrastructural facilities to offer to the students---an eco-friendly beautiful green campus of 3.9 acre in the heart of the city, medicinal plant garden and dedicated teachers, a well-stocked automated Library with e-journals and OPAC facility, well equipped Science Laboratories, Classes with ICT tools, Computer Laboratory, Cheap Canteen providing hygienic food, safe and pure drinking water, cycle stand, toilet for differently abled persons, clean Hostel for students, expansive playground and attractive sports facilities. The students can avail free internet facility for academic purpose under the guidance of their teachers. The College office is aimed to provide easy, automated services to the students. They find the non-teaching employees very supportive and helpful. The whole College campus is under 24x7 CCT surveillance. Students coming from distant parts of the district as well as from outside the district can find accommodation in the College Hostel located inside the campus at a cheap rate. It is completely safe and secure with three full time Hostel employees and other staff to take care of the boarders.

The Institution offers Honours Courses in ten subjects at undergraduate level in the faculty of Science (Chemistry and Mathematics, Geography, Economics), Literature (Bengali, English and Sanskrit) and Humanities & Social Sciences (History, Political Science and Philosophy) respectively. It emphasizes on regular class teaching complemented with special lectures by eminent faculty members and inter-departmental lectures throughout the year. A variety of add-on certificate courses, Study tours, Seminars and workshops are offered to the students to add extra edge to their domain of knowledge. As an outcome of the discipline and regular theoretical and practical classes, class tests, the students do fairly well in College examinations, sometimes scoring highest marks in some subjects.

The College has a vibrant career counseling and placement cell to empower students in their journey towards career growth. The cell arranges various training programmes, mostly free of cost, to enhance communicative skill and ICT skill of the students. We also offer few regular courses for skill enhancement and capacity building of our students. Currently, we are running an app based certificate course on communicative English, offered by British Council Library. This year we have planned to introduce a certificate course on Computer offered by WEBEL. The College also maintains an online job portal to prepare students for competitive examinations.

To encourage students from the marginalized sections of society, various scholarships like Kanyasree , OASIS , SVMCM, Aikyashree, The Hon'ble Chief Minister's Relief Fund are available for the students. They are also assisted to avail scholarship provided from NSP, Priyangbada Devi Birla Memorial fund, Department of Armed Forces and from few other organizations. Students get all the supportive help from the dedicated staff while applying for the scholarships and Students Credit Card through online portal.

Ragging is strictly prohibited in the College and the hostel. Besides, College has set an Internal Complaint Committee (ICC) where students may lodge any complaint if they have any and it is addressed with extreme care.

The College is committed to imparting a holistic development of the students by encouraging them to take part in various co-curricular and extension activities and their achievements in this field are recognized in the Annual Prize Distribution Ceremony. A variety of programmes organized by the Cultural and Magazine Sub-Committee, like observation of days of National and International importance are a regular feature of the institution. Publication of departmental wall magazines and College magazine helps the students to see their own writings in print for the first time.

We also take care of mental and physical health of our students. They can avail free of cost treatment and medicine from Students Health Home centre near our College. We also arrange health check up camps in the campus.

NSS unit of the College monitors our environment-friendly campus and provides students with the ambience necessary at a centre for teaching and learning. The NSS Volunteers are actively engaged in outreach programmes viz. adopting slum area, conducting survey in the surrounding villages, organizing seminars ,distributing essentials among the children of the adopted village and organizing a health-check up camp for them.

Office of the Krishnagar Women's College is aimed to provide easy, automated and hassle free services to its students with several wings of the office. Students can access their college related data, can pay fees online and can send their application for College registration/ Examination through 'Student Portal' with their student ID and own password.

The College has the legacy of having eminent academicians and renowned personalities at its helm to frame policy for overall academic and infrastructural development of the College. At present the College is run by a Governing Body headed by an acclaimed academician, Sri Siddhartha Majumdar, Associate Professor, City College, Kolkata. The Principal, Dr. Natasa Dasgupta, a renowned academician and an accomplished social personality, is empowered to implement the decisions taken by the Governing Body. Apart from the Governing Body, IQAC plays an important role in working closely with the faculties to create an effective teaching-learning environment with a view to reach the goal of the institution. The College has signed MoU with few neighbouring Colleges and is engaged in various collaborative research and training projects.

Krishnagar Women's College, once established to cater to the need of the post-partition displaced girls is now serving as a multifaceted centre for empowerment of girls. Projects like installation of solar panel, Water ATM under Sajal Dhara Prakalpo, and introduction of two new courses are in the pipeline. Challenges are many and in spite of that, we envisage to take this only Women's College in the district to a new era of emancipation, academic and creative excellence.

2.2 Vision & Mission of the College:

Vision :

As an educational institute the College envisions to create an academic space dedicated to the holistic growth of potential female leaders of our state who will exhibit novelty in their professional competencies, integration in their personal lives and inclusion in their social involvement.

Mission :

- To impart skill, and encourage perfection.
- To stimulate decisive and original thought process.

- To promote multi-disciplinary knowledge and a broadened intellectual perspective.

- To link curriculum with contemporary social models and scientific applications.
- To make the self socially and environmentally valuable.
- To foster confidence, boost self esteem and vision.
- To develop executive and management capabilities.

- To encourage inspired and shared engagement in curricular and co/extra-curricular activities.

- To strive for social accord and camaraderie.
- To empathize for the marginalized and the disempowered.
- To be capable enough to break the glass ceiling.

2.3 Campus Infrastructure:

Krishnagar Women's College is ragging free Green Campus with free internet facility. It has a very good and systematic building infrastructure. All the classrooms are spacious, well ventilated and comfortable. Total area of college over 3.9 Acre. The college following facilities are available:

Digital Library :

- For the benefit of the students and teachers the institution upgraded its library. Digital Kiosk has been installed to get a glimpse of the books present in the library. Every year books of different departments are added, and the kiosk is updated accordingly.



Fig. 1 Digital Library

Students' Common Room with Vending Machine & Gym. :

- "All work and no play make Jack a dull boy", keeping this proverb in mind, our institution provide a common room for the students to enjoy a recreational safe space to get along and build relationship with various other peers, from across different disciplines, who can interact and gel to create strong bond which intern would build a foundation to generate an effectual student body in the institution.
- During free time or recess, the students try their hand in in-door games like playing carom, ludo, etc. The common room is not only used as a space to transmit verbal ideas, but also it is a space where students practice their creative and extra-curricular activities. Rehearsals for Cultural and Annual Programme are executed. We also provide an extensive gym equipment like a treadmill, Exercycle, few weights, etc to motivate our students to be mentally and physically fit. We have also taken an initiative to install a sanitary napkins' vending machine for our all-beloved students, that they might get, whenever necessary sanitary napkins, and dispose them properly. We also provide sick bed; in case our students need them.



Fig. 2 Gym & Vending Machine

Play Ground :

- A playground in a institution is not merely a space for recreation but a vital component of holistic student development. It offers a platform for physical activity, promoting health and well-being among students who often lead sedentary lifestyles due to academic pressures. Beyond physical benefits, the playground fosters social interaction, teamwork, and leadership skills through sports and recreational activities. It serves as a stress-relief outlet, allowing students to rejuvenate and maintain a healthy balance between academic rigor and leisure. Additionally, the playground provides a venue for extracurricular events, enhancing campus vibrancy and fostering a sense of community among students. Overall, a playground in a college plays a crucial role in nurturing students' physical, social, and emotional growth, contributing to their overall academic success and personal development.



Fig. 3 Play Ground

Cycle Stand :

- The institution provides both the students and the college staffs a protected and shaded cycle stand inside the college campus.



Fig. 4 Cycle Stand

Science Laboratory :

- The institution has Departments of Geography, Chemistry, Physics and all the departments has different labs for the practical works.



Fig. 5 Science Laboratory

Purified Drinking Water :

- Water is one of the most important needs of human life. Drinking water for any intuition is another important thing since both the students and the college staffs spend more than five hours in the institution. Therefore, for the safe keeping of the students and the staffs the institution has provided four water purifier machines and a 'Sajal Dhara'. The 'Sajal Dhara' itself holds more than 5000 Liters of water, which uses solar energy to collect the water.



Fig. 6 Purified Drinking Water

Canteen :

- The canteen at Krishnagar Women's College serves as an essential hub for students and faculty. It is easily accessible to students and faculty both. The canteen maintains satisfactory hygiene standards. The quality of food served at the canteen is generally satisfactory, with freshness and taste being notable aspects. The canteen offers a diverse range of menu options to cater to varying preferences and dietary requirements. Vegetarian and non-vegetarian options are also available. The pricing of items at the canteen is reasonable and affordable for the majority of students. It reflects the economic constraints often faced by college-goers while maintaining a balance with the quality and quantity of food served.

- The canteen at Krishnagar Women's College plays a vital role in the daily lives of its students and faculty members. It serves as more than just a food outlet; it fosters a sense of community and camaraderie among individuals from diverse backgrounds. While there is room for improvement in certain aspects such as cleanliness and food consistency, the overall experience remains positive and enriching.
 - In conclusion, the canteen at Krishnagar Women's College is an integral part of the campus ecosystem, providing essential services and contributing to the holistic development of its stakeholders. By addressing areas of improvement highlighted in this report, the canteen can further enhance its offerings and continue to serve the college community effectively.



Fig. 7 College Canteen

Smart Class Room :

- The institution, along with a proper digital seminar hall, provides several smart classrooms for the betterment of the students. Smart classrooms in colleges represent the future of education, integrating technology to enhance teaching and learning experiences. Equipped with interactive whiteboards, audiovisual systems, and high-speed internet, these classrooms foster dynamic and engaging lessons. They allow instructors to incorporate multimedia content, simulations, and real-time data, making complex concepts more understandable and memorable. Students benefit from personalized learning experiences, interactive discussions, and immediate access to digital resources, empowering them to actively participate in their education. Furthermore, smart classrooms facilitate collaboration among students, encouraging teamwork and problem-solving skills. With features like remote access and virtual labs, they also enable flexible and innovative teaching methods. Overall, smart classrooms revolutionize the traditional learning environment, preparing students for the demands of the digital age and fostering a culture of continuous learning and innovation.



Fig. 8 Smart Class Room

Free Internet and CCTV Cameras installed :

- Free Wi-Fi is made available to the students and Teachers in the Campus. CCTV Cameras are installed at various corners of the college. The College has developed its own website namely www.krishnagarwomenscollege.org.

Hospital/Medical Facilities :

- The college has there is a medical room for initial First-Aid treatment for students and staff. The college has arranged medical checkups for the students every month by a Doctor. There is a well-equipped government hospital in close proximity (within 1.6 Km) of the College. Students and staff can avail of medical facilities there. Hospital staffs are very helpful to provide priority medical services to the students.

Institutional Strength :

- Promoting teaching learning through project work.
- Healthy academic atmosphere.
- Facility of computerization in office and library.
- Prompt assistance from the surrounding locality.
- Academic counseling.
- Eco-friendly atmosphere.
- A multigym for students & staff.
- A cheap canteen.
- Safe drinking water.
- ICT enabled classrooms
- Incubation Cell for students & staff

CHAPTER - 3

GREEN AUDIT METHODOLOGY

3.1 Utility of Green Auditing

Green audit is used to improve existing anthropogenic activities, with the object to reduce the adverse effects of these activities upon environment. An environmental auditor will study an organization's efforts to conserve the environment in a systematic and documented manner and will produce an environmental audit report.

3.2 Objectives of the Study

The basic objective of green audit is to promote environment management and conservation in the college campus. Purpose of the audit is to identify, quantify, describe and prioritize the framework of environmental sustainability in compliance with the applicable regulations, policies and standards. Major objectives of carrying out green audit are:

- To introduce an awareness among the students regarding real concerns of environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.

3.3 Methodology

In order to perform green audit, methodology included different techniques such as physical inspection of the campuses, observation and review of the documentation, interviewing key persons and data analysis, measurement of the present status of environment management in the campuses:

- Water quality assessment, consumption and management
- Air quality assessment and management
- Electricity consumption and management
- Sound pollution monitoring
- Waste management
- Bio diversity status of the campus
- Land use and land coverage
- Rain water Harvesting
- Use of alternate energy sources.

CHAPTER - 4

LAND USE ANALYSIS, KRISHNAGAR WOMEN'S COLLEGE, KRISHNAGAR, NADIA.

4.1 General overview of the concept of land use:

Land use refers to man's activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape.

4.2 Methodology adopted for land use mapping

Three types of data that are GPS points, field survey data and Google earth data for Geo-referencing have been used in this study. Land use map of the study area have been prepared using field survey

Land Use System The Krishnagar Women's College, located behind DM Bunglo & Circuit House, Krishnagar, District - Nadia, West Bengal, geographically lies between 23.4097349°N and 88.4774427°E. The College has a total of 3.9 acre of land which was transferred from Department of Forests, Government of West Bengal for the purpose of creating infrastructure required for the development of various Offices/ Departments of the College. The total buildup area of the College is 0.53 acre which includes Academic/ Administrative building, computer lab, toilets, classroom, common room, canteen and parking area. The remaining 3.37 acre area includes the park/garden, plantation area and forest green cover etc.

CLASSIFICATION SCHEME FOR LAND USE ANALYSIS OF BUILT UP AREA

Level-I	Level-II
1. Built- up land area	1.1 Dense 1.2 Moderate 1.3 Sparse

Therefore, attempt has been made in this study to map land use for Krishnagar Women's College with a view to detect the land consumption in the built-up land area.

LAND USE DATA OF COLLEGE OF KRISHNAGAR WOMEN'S COLLEGE

CATEGORIES OF LAND USE	AREA IN SQ METRES
OPEN SPACE AND PLANTATION	13653.83
GROUND COVERAGE	2128.91
TOTAL LAND AREA	15782.74

Ground coverage of 13.49% (i.e 2128.91 sq.mtr.) consists of the buildings.

FINDINGS:

Krishnagar Women's College, which was established in the year 1958, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 86.51% of the total area is occupied by open land and plantation that generates a better and sustainable campus environment.

CHAPTER – 5

WATER QUALITY ASSESSMENT CONSUMPTION & MANAGEMENT

5.1 Water Quality Analysis Test Report

DOC NO : QLS/SAMP/08-D/00

Name & Address Of the Customer : M/s. Krsihngar Women's College Aurobindo Sarani, Krishnagar, Nadia – 741 101.	Report No.	: QLS/MR/W/23-24/C/128
	Date	: 29.05.2023
	Sample No.	: QLS/MR/W/23-24/128
	Sample Description	: Drinking Water
	Sample Location	: Canteen Aquaguard
	Sample Drawn On	: 16.05.2023
Date of Performance	: 17.05.2023-24.05.2023	

Analysis Result

(A) Microbiological Analysis

Sl. No.	Characteristic	Limit as per Drinking Water Standard : IS:10500, 2012 RA:2018 Amd. 2	Test Method	Result
1.	Total Coliform Bacteria/100ml	Not Detectable	IS 15185-2016	Not Detected
2.	E.coli /100ml	Not Detectable	IS 15185: 2016	Not Detected

(B) Chemical Analysis

Sl. No.	Test Parameter	Test Method	As per Drinking Water Standard : IS:10500, 2012 RA:2018 Amd. 1 & 2		Result
			Acceptable Limit	Permissible Limit	
1.	pH Value at 25°C	IS 3025 (Part 11)- 1984 (RA: 2019)	6.5-8.5	No Relaxation	7.67
2.	Turbidity in NTU	IS 3025 (Part 10)- 1984 (RA: 2017)	1	5	<1.0
3.	Total Dissolved Solids (TDS) in mg/l	IS 3025(Part 16)- 1984 (RA: 2017)	500	2000	257
4.	Calcium(as Ca) in mg/l	IS 3025 (Part 40)- 1991 (RA: 2019)	75	200	38.5
5.	Chloride(as Cl) in mg/l	IS 3025 (Part 32)- 1988 (RA: 2019)	250	1000	47.0
6.	Iron (as Fe) in mg/l	IS 3025(Part 53)-1988 (RA: 2019)	1.0	No Relaxation	0.31
7.	Magnesium(as Mg) in mg/l	APHA 24 th edition-2023, 3500 Mg.	30	100	19.5
8.	Nitrate (as NO ₃) in mg/l	IS 3025 (Part 34)-1988 (RA: 2019)	45	No Relaxation	<0.5
9.	Free Residual Chlorine in mg/l	IS 3025 (Part 26): 1986(RA 2021)	0.2	1.0	<0.1
10.	Sulphate (as SO ₄) in mg/l	IS 3025 (Part 24)-1986, (RA: 2022)	200	400	28.2
11.	Alkalinity (as CaCO ₃) in mg/l	IS 3025 (Part 23)- 1986, (RA: 2019)	200	600	193.3
12.	Total Arsenic(as As) in mg/l	IS 3025 (Part 37):1988,(RA 2019)	0.01	No Relaxation	<0.01
13.	Total Hardness (as CaCO ₃) in mg/l	IS 3025 (Part 21)-1983, RA: 2019	200	600	178.1

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(Authorized Signatory)



Fig. 9 : Drinking water sample collection

SOURCES OF WATER

- From Municipality
- Bore Well

Total water storage capacity in the Institute.

Sl. No.	Name of Building	Storage Resources	Number of Tank	Qty. (Liters)	Total Storage capacity in (Liter)
1	Main College Building	Municipality Water Supply	2	2000	4000
2	Dipti Bose Bhasha Bhavan	Municipality Water Supply	2	2000	4000
3	Sajal Dhara	Bore Well	1	3000	3000
4	Sajal Dhara	Bore Well	1	2000	2000
	Total Storage capacity				13000

Total requirement of water is drawn from the Municipal & Bore Well installed in the campus.

The total water consumption in the Campus is 13000 litres per day. The per capita utilization of the College is 8.69 Litres per day. The utilizations of such a huge resource of water include usage for drinking, cleaning, laboratory use, garden use.



Fig. 10 : Drinking water storage tank

WASTE WATER TEST REPORT

DOC NO : QLS/SAMP/08-D/00

Name & Address Of the Customer : M/s. Krishnagar Women's College Aurobindo Sarani, Krishnagar, Nadia – 741 101.	Report No. : QLS/MR/W/23-24/C/129 Date : 29.05.2023 Sample No. : QLS/MR/W/23-24/129 Sample Description : Waste Water Sample Location : Outside Gate Sample Drawn On : 16.05.2023 Date of Performance : 17.05.2023-24.05.2023
---	--

Analysis Result

Sl. No.	Parameter	TEST METHOD	Result	Limit as per CPCB for discharge of effluents	
				Inland Surface Water	Public Sewers
1	pH at 25°C	APHA 24th Edition-2023, 4500 H+	7.49	5.5 to 9.0	5.5 to 9.0
2	Total Suspended Solid in mg/l	APHA 24 th Edition-2023, 2540 D	23	100	600
3	Chemical Oxygen Demand (as COD) mg/l	APHA 24 th Edition-2023, 5220B	75	250	---
4	Biochemical Oxygen Demand (as BOD) mg/l	IS 3025 (Part 44)-1993, RA:2019	19	30	350
5	Oil & Grease in mg/l	APHA 24 th Edition-2023, 5520A	3.1	10	20

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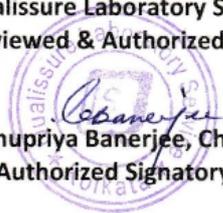

 Bishnupriya Banerjee, Chemist
 (Authorized Signatory)



Fig. 11 : Waste water sample collection

Rain Water Harvesting System :

The Rain Water Harvesting project has begun and by the end of 2024 Green Committee is hopeful to complete the Rain Water Harvesting project and start utilizing it.



Fig. 12 Rain Water Harvesting Project's Site in Campus

CHAPTER – 6

AMBIENT AIR QUALITY ASSESSMENT AND MANAGEMENT

6.1 Air Quality Test Report

DOC NO : QLS/SAMP/08-A/00

Name & Address Of the Customer : M/s. Krishnagar Women's College Aurobindo Sarani, Krishnagar, Nadia – 741 101.	Report No. : QLS/MR/A/23-24/C/98 Date : 29.05.2023 Sample No. : QLS/MR/A/23-24/98 Sample Description : Ambient Air Sample Mark : Near Main Gate
---	---

Analysis Result

Location : Near Main Gate		Date of sampling : 16.05.2023-17.05.2023		
Sampling Done by: B. Mondal/C. Sahoo		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition: Clear & Sunny		Average Temperature : 32°C		
Barometric Pressure : 756 mm of Hg		Average Humidity : 44%		
Sl. No.	Pollutants	Result	Limit as per CPCB	Method of Test Reference
1	Particulate matter (<10µm) in µg/m ³	74	100	IS: 5182 (Part-23), RA-2017
2	Particulate matter (<2.5µm) in µg/m ³	34	60	USEPA CFR-40,Part-50, Appendix-L
3	Sulphur dioxide (SO ₂) in µg/m ³	6.6	80	IS: 5182 (Part-2)-2001, RA-2017
4	Nitrogen dioxide (NO ₂) in µg/m ³	29.9	80	IS: 5182 (Part- 6)-2006, RA-2017
5	Carbon Monoxide (CO) in µg/m ³	730	2000	IS: 5182 (Part-10):1999,RA-2014
NOTE: Limit as per CPCB notification, New Delhi, 18 th November 2009, for Ambient air quality.				

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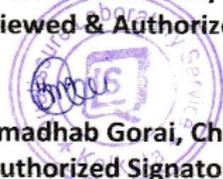

Benimadhab Gorai, Chemist
(Authorized Signatory)



Fig. 13 : Ambient Air sample collection

FINDINGS

Central Pollution Control Board, New Delhi has set guidelines to monitor and analyze the air pollution quality parameters. The trees covers on the campus are the leading sources to absorb CO₂ and release enough fresh O₂ across the Campus. The result shows that GNIPST Campus's air quality status is very good as compared to other locations. It is identified that KWC campus is a green campus with observed minimum air pollution as compared to other Ambient Air Pollution Centers located in different parts of the city.

Sources of air pollution: It was observed and revealed from data that the only possible sources of pollution in the College campus are as use of diesel / petrol vehicles, air-conditioners, power generator, kitchen waste and other biodegradable waste from canteen, use of electronic appliances and other. 10 student & employees use two wheeler and rest 1490 people use public transport for commuting to the college. There is no industry around the college, the college surrounded by greenery. So the possibility of air pollution is very low.

CHAPTER – 7

NOISE MONITORING

7.1 Ambient Noise Monitoring Status:

Ambient noise monitoring was carried out in Krishnagar Women's College campus. The sampling was carried out using calibrated Sound Level Meter by logarithmic scale in decibels (dB). The noise readings were collected at day and night time.

TEST REPORT

Name & Address Of the Customer : M/s. Krishnagar Women's College Aurobindo Sarani, Krishnagar, Nadia – 741 101.	Report No. : QLS/MR/A/23-24/C/142 Date : 29.05.2023 Sample No. : QLS/MR/A/23-24/142 Sample Description : Ambient Noise
---	---

Sampling Done By: B.Mondal/C.Sahoo				
Sampling Guideline : As per IS: 9876: 1981 (RA-2001)				
Sample No.	Date of Monitoring	Location	Leq dB (A) Day Time	Leq dB (A) Night Time
142	16.05.2023 – 17.05.2023	Near Main Gate	57.3	45.3

Code/ Category	Leq dB (A)Day Time	Leq dB (A)Night Time	NOTE: Day Time : 06.00 Hr. – 22.00 Hr. Night Time : 22.00 Hr. – 06.00 Hr.
A/Industrial	75	70	
B/Commercial	65	55	
C/Residential	55	45	
D/Ecological Sensitive	50	40	

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(Authorized Signatory)



Fig. 14 : Noise level monitoring

Sources of noise pollution: It was observed that there is no industrial as well as the sound generating activities near the College campus and it was revealed from that due to limited number of vehicles the chances of noise pollution seems to be quite below of standard limit. Moreover the two generators of the College are also sound proof. There is no other source of noise pollution in the campus.

Carbon Neutrality

Students and staff members are made aware of pollution caused by use of vehicles and bicycles. Most of the students in the college use bicycle for commuting and most of the staff members reside nearby. They either avail public transport, bicycle. Besides, residences of some of the staff are in the vicinity of the college and they commute by walking. In the college campus almost 1% of students are using bicycles, 99% of student using local transport. The carbon consumption awareness programme improves carbon emission at individual as well as social level. It also helps the college authorities to avoid air and noise pollution in the campus due to vehicles or any activity in it.

CHAPTER – 8

ENERGY AUDIT

Source of Energy

KWC withdraws Energy from followings:

- Electricity from WBSEDCL
- Solar Energy

The following are the Major consumers of Electricity in the facility

- Lighting
- Air Conditioner
- Fans
- Computers
- Other lab Equipment

DIESEL GENERATOR DETAILS

The Mangalore Institute of Technology has installed 2 nos. of Diesel Generator. The following table provides the Diesel generator capacity in the college campus.

Sl. No.	Equipment Name	Make	Capacity (KVA)
1	Diesel Generator	Kirloskar	15
2	Diesel Generator	Kirloskar	15

ELECTRICITY CONSUMPTION (IN UNIT) AND MANAGEMENT

Common electricity meter is provided for the entire campus. Electricity is provided by West Bengal State Electricity Development Corporation. Electricity bills of July 2023 to June 2024 were available for review (average consumption 1465 units/ month).

The areas of major consumption of electricity are:

- Tube Lights • LEDs • Fans (ceiling, wall & exhaust) • Air Conditioners • Computers (desktops & laptops) • Projectors • Audio-Visual System • RO system • Water Coolers • Water Pump • Photocopier • Printers • LCD projectors

8.1 General Details:

Sl.No.	PARTICULARS	DETAILS	
1	Name & Address of College	Krishnagar Women's College Aurobindo Sarani, Krishnagar, Nadia – 741 101.	
	Web Site	https://www.kwc.ac.in	
2	Name of Contact Officer	Dr. Natasa Dasgupta	
	Designation	Principal	
	Name of Alternative Officer	Dr. Anuradha Chattopadhyay	
	Designation	Convener, Green Audit, Associate Professor, Department of Philosophy	
3	Telephone No.	03472252355	
	Mobile No.	9433256171	
	Fax No.		
	e-mail ID	kwc.edu@gmail.com/ndgkwc@gmail.com	
	No. of shift	11.00 a.m.. TO 17.00 p.m.	
	No. of Employees (Permanent & Casual) Approx	37	
4	Electricity Consumption	Imported (Purchased) 15401	
5	Specific Energy Consumption	Fuel	Electricity
		1391.40	Rs. 1,42,850/- (Per year)
6	LPD	2.4 W/sf.	
7	EPI	1.65	

8.2 Electrical Details

a) Transformers

	No. 1
Voltage Ratio	N/A
KVA	N/A
% Impedence	N/A

b) Electricity Consumption

	Particulars	Demand
A	Contract demand KVA	10.12
B	Maximum demand	10.12
C	Total Energy units consumed / month	1283
D	Avg. Power Factor (P.F.)	0.99
E	Avg. Energy bills (Rs/month)	Rs.11,904/-

c) Detailed list of Electric Motors operating in the college

S.NO.	NAME OF THE PLANT	RATING OF MOTOR (KW)	NO. OF MOTORS
1	Krishnagar Women's College Krishnagar, Nadia.	2.23	2 nos.

d) **Connected Load**

	EQUIPMENT	TOTAL NUMBERS	LOAD IN KW (TOTAL)
A	Motors : Greater than 10kW	NIL	NIL
	: Less than 10 kW	2Nos.	2.23 KW
B	AC & Ventilation with TR capacity		
a)	Others (Package ACs/ Split ACs / Windows ACs), with TR	Room AC of Split/Window type – 75.61 KW	
C	Total Process Load (in kW)	77.84 KW	
D	Total Lighting Load (in kW) & Luminaries details	No's of lighting luminaries (LED+T/L+ (including fan) Tube Light, Led Light etc. = 3.66 KW Electric Fan - 7.02 KW	
	Total Load (in KW)	88.52 KW	

A. Lux Measurements :

Sl. No.	Room	LUX level	Remarks
1.	Main Building		
	Ground Floor	301,301,299,305	
	1 st floor	299,303,297,300	
	2 nd floor	301,305,302,305	
2	Dipti Bose Bhasha Bhavan		
	Ground floor	302,299,304,301	
	1 st floor	298,306,302,303	

Illumination Level Comparison

Area	Average Lighting Level (LUX)	NBC Recommended
MAIN BUILDING	301	300-500
DIPTI BOSE BHASHA BHAVAN	302	300-500

Remarks: Lights needs cleaning at an interval of one month and old light to be replaced by new to get desired LUX value

8.3 Use of Alternate Energy

To reduce the cost of electricity, there is a need to install solar system in the college.

CHAPTER - 9

WASTE MANAGEMENT

The present Honable Prime Minister of India Sri Narendra Modi launched 'Swachh Bharat Abhiyan' (Clean India Mission) on 2nd October, 2014. In this mission, the proper use of dust/waste bins is one of the major priorities. To implement this mission, collective mass effort is necessary. For proper segregation and management proper use of waste bins is the only solution for waste management purpose in the college campuses.

9.1 Solid Waste

Krishnagar Women's College has set up separate bins to ensure proper segregation and collection of the biodegradable, non-biodegradable and hazardous waste products generated in the campus. The responsibility of recyclable waste is however still not taken up due to devoid of recycling device to carry on the procedure. However, several solid wastes such as glass, cans, used white and brown papers, batteries, print cartridges, cardboard, furniture, damaged pen, carbon papers etc are either sold to vendors for recycling or despatched via municipality disposal van on regular basis. The biodegradable waste such as humus, rest portion of vegetables etc. which are used in college canteen.



Fig. 15: Solid Waste

9.2 Liquid Waste

The source of wastewater is Domestic Waste Water i.e., Sewage water. The Sewage water mainly comes from laboratory of different departments, toilets of college, kitchen and canteen.

9.3 E-Waste

Substantial quantity of e waste is generated due to extensive use of computer.

All members particularly students have been advised not to throw used pendrive etc. any where, but to keep in designated bins. Waste thus collected is stored in secured place.

E-Waste is accumulated in a separate room, stock of such waste as on date is quite substantial.

As per the guidelines of Pollution Control board (P.C.B.) e-waste is to be disposed off through approved vendors of the P.C.B.

The College should take steps for disposal through the approved vendors.



Fig. 16: E-Waste

CHAPTER – 10

ENVIRONMENT AUDIT

BIODIVERSITY STATUS OF THE COLLEGE CAMPUS

10.1 Introduction

Krishnagar Women's College campus is very rich in the term of biodiversity. To conserve this biodiversity, our first need is to learn about the existing diversity of the place. Unless we know whom to conserve, we will not be able to plan proper conservation initiatives. Also, it is important to have an understanding of the biodiversity of an area so that the local people can be aware of the richness of biodiversity of the place they are living in and their responsibility to maintain that richness.

10.2 Objective

The main objective of this study is to get a baseline data of bio-diversity of the area which will include:

1. Documentation of the floral diversity of the area: its trees, herbs, shrubs, climbers and aquatic vegetations.
2. Documentation of the major faunal groups like mammals, reptiles, amphibians, birds and among the insects, butterflies and dragonflies.
3. Documentation of the specific interdependence of floral and faunal life.

Transportation of the College

This college is well connected with different parts of North 24 Parganas district and Kolkata by bus and local trains. Lot of bus services to Kolkata is available here. The nearest railway station is Krishnanagar with in 3.3 km. The nearest international and domestic airport is Netaji Subhas Chandra Bose International Airport of Kolkata.

Location Map

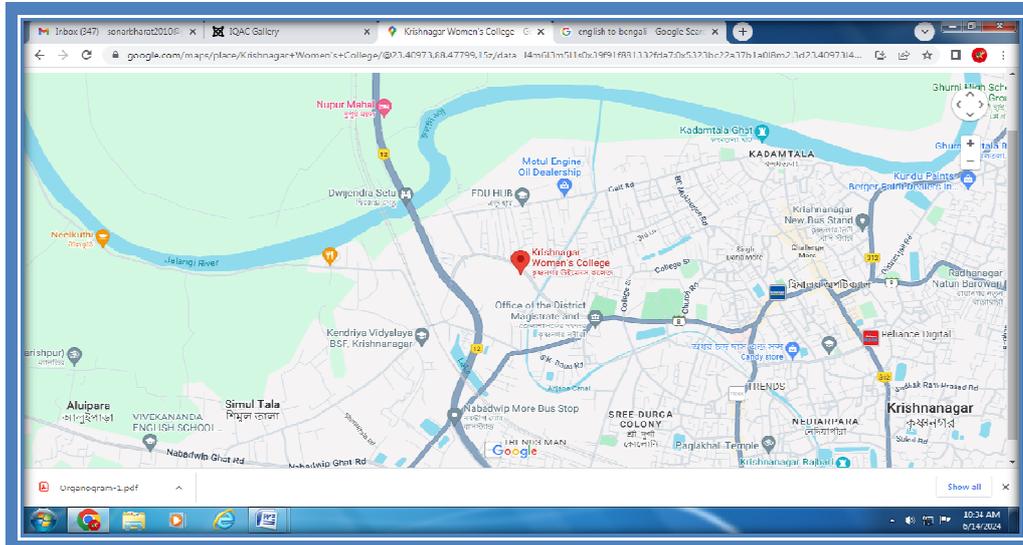


Fig. 17 : Location Map

10.3 Method of Study

Brief methodology for the floral and faunal survey is given below:

- a) Sampling was done mostly in random manner.
- b) Surveys were conducted for the maximum possible hours in day time.
- c) Tree species were documented through physical verification on foot and photographed each species as much as possible.
- d) The total area was surveyed by walking at day time.
- e) For faunal species we emphasized mainly on the direct sighting. Also call of various birds and amphibians and nesting of some faunal species were considered as direct evidences.
- f) Observing mammals depend critically on the size of the species and its natural history. Diurnal species are common and highly visible. Nocturnal species, however, are rare and difficult to detect. Small mammals like the field rats were found near their burrows, particularly during their entry or exit times in or out from their burrows respectively. In some cases, deposits and footprints were also observed that served as a potential clue for the presence and absence of the concerned species. These secondary evidences were all noted with time and space co-ordinates.
- g) Birds are often brightly coloured, highly vocal at certain times of the year and relatively easy to see. Sampling was done on the basis of direct sighting, call determination and from the nests of some bird species
- h) Reptiles were found mostly by looking in potential shelter sites like crevices of building, logs, tree hollows and leaf litter and also among and underneath the hedges. Sometimes some species, particularly the garden lizards were also observed in open spaces (on twigs and branches and even on brick constructions) while they were basking under direct and bright sunlight.
- i) Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were searched near pond, road beside wetland and in other possible areas. Diurnal search operations are also successful.

- j) Active invertebrates like the insects require more active search. For larger winged insects like butterflies, dragonflies and damselflies, random samplings were carried and point sampling was also done.
- k) The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or microhabitat. Searching was carried out under stones, logs, bark, in crevices in the walls and rocks and also in leaf litter, dung etc. slugs and snails are more conspicuous during wet weather.

10.4 Plant diversity in the College Campus

Krishnagar Women's College premises having about 3.37 Acre of land have unique plant diversities. These include some large trees, shrubs and herbs.

These plants are listed and depicted as following:

List of the Plants of College Campus

Sl. No.	Local Name	Scientific Name	Family
1	Bakul	<i>Mimusops elengi</i>	Caesalpiniaceae
3	Red oleander, Karabi	<i>Nerium indicum</i>	Apocynaceae
4	Tagar plant	<i>Tabernaemontana divaricata</i>	Apocynaceae
5	Parijat, Shiuli	<i>Nyctanthes arbor-tristis</i>	Oleaceae
6	Aparajita	<i>Clitoria ternatea</i>	Fabaceae
7	Palash	<i>Butea monosperma</i>	Legumes
8	Siuli	<i>Nyctanthes Arbor-Tristis</i>	Oleaceac
9	Kak Dumur	<i>Ficus hispida</i>	Monaceae
10	Akashneem	<i>Millingtonia hostensis</i>	Bifnoniaceae
11	Amrah	<i>Spondias pinnata</i>	Anacardiaceae
12	Aam	<i>Mangifera indica</i>	Anacardiaceae
13	Ashok	<i>Saraca asoka</i>	Fabaceae
14	Ashwattha	<i>Ficus religiosa</i>	Moraceae
15	Debdaru	<i>Polialthia longifolia</i>	Annonaceae
16	Bel	<i>Aegle marmelow</i>	Rutaceae
18	Bot	<i>Ficus benghalensis</i>	Moraceae
19	Chhatim	<i>Alstonia scholaris</i>	Apocynaceae
20	Christmass Tree	<i>Araucaria cookie</i>	Arucariaceae
25	Chikon	<i>Treema orientalis</i>	Cannabaceae
27	Chinese Cherry	<i>Muntingia calabura</i>	Muntingiaceae
28	Curry	<i>Murraya koenigii</i>	Rutaceae
29	Tentul	<i>Tamarindus indica</i>	Caesalpiniaceae
30	Gandharaj	<i>Gardenia Jasminoides</i>	Ruliaceae
31	Ghora neem	<i>Melia azedarach</i>	Meliaceae
32	Jagga Dumur	<i>Ficus glomerata</i>	Moraceae
33	Jam	<i>Syzygium cumini</i>	Myrtaceae
34	Jarul	<i>Lagerstroemia speciosa</i>	Lythraceae
35	Kadam	<i>Anthocephalus chinensis</i>	Rubiaceae
36	Kanak Champa	<i>Pterospermum acerifolium</i>	Malvaceae
37	Kanthal	<i>Artocarpus heterophyllus</i>	Moraceae
38	Kath Badam	<i>Terminalia catappa</i>	Combretaceae
39	Krishnachura	<i>Delonix regia</i>	Caesealpiniaceae
40	Kul (Topa Kul)	<i>Ziziphus mauritiana</i>	Rhamnaceae
41	Lal Shimul	<i>Bombax ceiba</i>	Malvaceae
42	Neem	<i>Azadirachta indica</i>	Meliaceae
43	Pakue	<i>Ficus infectoria</i>	Moraceae
44	Pepe	<i>Carica papaya</i>	Caricaceae
45	Peyara	<i>Psidium guajava</i>	Myrtaceae
46.	Putranjeeva	<i>Putranjiva roxburghii</i>	Euphorbiaceae
47.	Radhachura	<i>Peltoforum pterocarpum</i>	Caesalpiniaceae
48.	Segun	<i>Tectona grandis</i>	Verbenaceae
49.	Sisham	<i>Dalbergia sisoo</i>	Fabaceae
50.	Sojna	<i>Moringa oleifera</i>	Moringaceae
51.	Swama Champa	<i>Michelia champaca</i>	Magnoliaceae

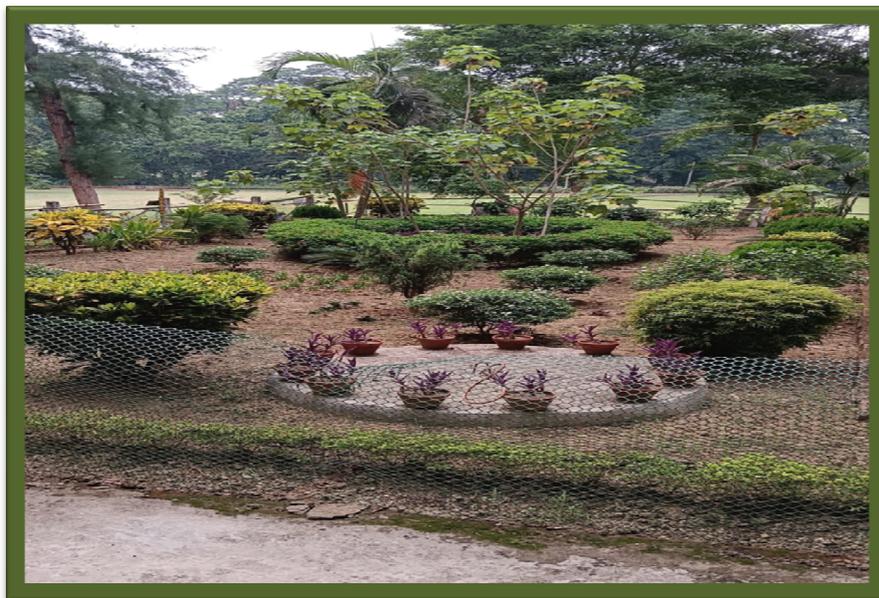
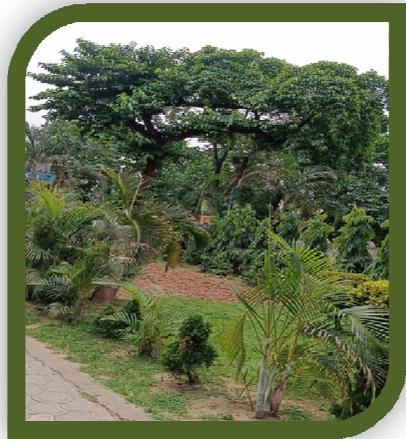


Fig. 18 : Major plants in the campus area

10.5 Medicinal Plants in the College Campus:

Medicinal plants have been planted in the college premises.

Sl. No.	Common Name	Scientific name	Uses
1	Basak	Justicia adhatoda	Cough, colds, asthma, bronchodilator
2	Apang	Achyranthes aspera Linn.	Anti-inflammatory and uterine stimulant activity, rheumatism, Hydrophobia.
3	Kalmehch	Andrographis paniculata (Burm.f.)	Fever, dysentery, dyspepsia, improves liver function, Leaves – in case of irregular stool, loss of appetite; roots – given to children to cure general debility.
4	Harjora	Cissus quadrangularis Linn. Syn. Vitis quadrangularis	Leaves – in bowel complaints; stem to cure scurvy, irregular menstruation, asthma, sap applied externally on forehead to cure one-sided headache.
5	Amlaki	Embilica officinalis Gaertn	Fruits – treat vomiting, leprosy, piles, anaemia; leaves – in ophthalmia.
6	Ramtulsi	Ocimum gratissimum Linn.	Leaves – Decoction of the leaf applied to treat septic wounds, Seeds – soaked in water and taken very cooling and refreshing drink.
7			
8	Jaba	Hibiscus rosasinensis Linn.	Flowers – in black colour of hair, female disease; leaves – soothing, used in growth of hair, Roots – in cold.
9	Telakucha	Coccinia grandis (Linn.) Voigt	Roots – in case of vomiting, burning sensation of hands and feet; Leaves – in cough and skin disease.
10	Arshagandha	Wythanasomnifera	Root, Leaf, Fruits and Seed
11	Akanda	Calotropis gigantea	Bark, Root, Leaf, Latex, Flower
12	Ayapan	Eupatorium triplinerve	Whole Plants
13	Tulsi	Ocimum sanctum	Leaf
14	Kari pata	Murrayakoenigii	Root, Leaf, Fruit
15	Bisallakaroni	Barlerialupulina	Leaf
16	Kulephara	Hygrophilaschulli	Whole plant
17	Gurmar	Gymnemasylvestre	Root, Leaf, Fruit
18	Grikumari	Aloe vera	Leaf
19	Thankuni	Cantellaasiatica	Leaf
20	Nayantara	Catharanthusroseus	Whole Plants
21	Neem	Azadirachta indica	Bark, Leaf, Young Stem, Unripe fruit, Seed Oil
22	Basak	Adhatodavasika	Leaf, Flower, Bark, Root
23	Bisllakarani	Gendarussa Vulgaris	Leaf
24	Bel	Aeglemarmelos	Root, Young Leaf, Flower, Ripe and Unripe Fruit
25	Sarpagan Jha	Raunolfiaserpentina	Leaf
26	Sughni	Marsileaminuta	Whole Plant
27	Karabi	Neriumodorum	Root, Leaf, Bark, Stem
28	Black Tulsi	Ocimumtenuiflorum	Whole Plant, Leaf, Seed
29	Muthagrass	Cyperusrotundus	Root



Fig. 19 : Medicinal plants in the campus area

10.6 Vegetable Garden in the College Campus:

Vegetable Garden have been planted in the college premises..



Fig. 20 : Vegetable Garden in the campus area

10.7 Checklist of Reptiles:

Sl. No.	Local Name	Common name	Scientific name
1	Darash	Rat Snake	<i>Zamenis longissimus</i>
2	Anjani	Skink	<i>Lampropholis sp.</i>
3	Girgiti	Chamaeleon	<i>Calotes versicolor</i>
4	Tiktiki	Common House Gecko/Gekko, Lizard	<i>Hemidactylus frenatus</i>
5	Hele	Buff Striped Keelback	<i>Colubridae</i>



Fig. 21 : Reptiles

10.8 Checklist of Birds:

A total of 52 types of bird species were found in the campus, which is quite a good number, in spite of the industrialized surrounding around it.

Total bird species encountered in the college campus.

Sl. No.	Common name	Scientific Name	Local Name	Family
1	Black Kite	<i>Milvius migrans</i>	Chil/Dom Chil	Accipitridae
2	Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>	Madhuchil/Moubaz	Accipitridae
3	Shikra	<i>Accipiter badius</i>	Shikra	Accipitridae
4	White-breasted Waterhen	<i>Amauornis phoenicurus</i>	Dhuk	Rallidae
5	Red-wattled Lapwing	<i>Vanellus indicus</i>	Hattiti	Charadriidae
6	Common Pigeon	<i>Columba livia</i>	Paira	Columbidae
7	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Kanthi Ghughu	Columbidae
8	Spotted Dove	<i>Streptopelia chinensis</i>	Tile Ghughu	Columbidae
9.	Yellow-footed Green Pigeon	<i>Treron phoenicoptera</i>	Harial	Columbidae
10.	Alexandrine Parakeet	<i>Psittacula eupatria</i>	Chandana	Psittacidae
11	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Tia	Psittacidae
12.	Pied Cuckoo	<i>Clamator jacobinus</i>	Chatak	Cuculidae
13.	Common Hawk Cuckoo	<i>Hierococcyx varius</i>	Papia/Chokh Gelo	Cuculidae
14.	Asian Koel	<i>Eudynamys scolopacea</i>	Kokil	Cuculidae
15.	Greater Coucal	<i>Centropus sinensis</i>	Kubu	Cuculidae
16.	Barn Owl	<i>Tyto alba</i>	Laxmi Pencha	Tytonidae
17.	Indian Scops Own	<i>Otus bakkamoena</i>	Khude Pencha	Strigidae
18.	Spotted Owlet	<i>Athene brama</i>	Kutur Pencha	Strigidae
19.	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	Talcharai/Talchonch	Apodidae
20.	Common Hoopoe	<i>Upupa epops</i>	Mohanchura	Upupidae
21.	Indian Roller	<i>Coracias benghalensis</i>	Nilkhonto	Coraciidae
22.	Stork-billed Kingfisher	<i>Pelargopsis capensis</i>	Gurial	Alcedinidae
23.	White-throated kingfisher	<i>Halcyon smymensis</i>	Sada Buk Machhranga	Alcedinidae
24.	Green Bee-eater	<i>Merops orientalis</i>	Bashpati	Meropidae
25.	Lineated Barbet	<i>Psilopogon lineatus</i>	Rekiha Basonto	Megalaimidae
26.	Blue-throated Barbet	<i>Psilopogon asiaticus</i>	Nilkantha Basontobouri	Megalaimidae
27.	Coppersmith Barbet	<i>Megalaima</i>	Chhoto Basontobouri	Megalaimidae

Sl. No.	Common name	Scientific Name	Local Name	Family
28.	Fulvous-Breasted Woodpecker	<i>Dendrocopos macei</i>	Jarad Kaththokra	Picidae
29.	Streak-throated Woodpecker	<i>Picus xanthopygaeus</i>	Chhoto Sabuj Kaththokra	Picidae
30.	Black-rumped Flameback	<i>Dinopium benghalense</i>	Chhoto Sonali Kaththokra	Picidae
31.	Ashy Woodswallow	<i>Artamus fuscus</i>	Tal Chatak	Artamidae
32.	Common lora	<i>Aegithina tiphia</i>	Fotikjal	Aegithinidae
33.	Brown Shrike	<i>Lanius cristatus</i>	Kajol Pakhi	Lanidae
34.	Long-tailed Shrike	<i>Lanius schach</i>	Metelatore	Lanidae
35.	Black Drongo	<i>Dicrurus mactocedrus</i>	Finge	Dicruridae
36.	Black-hooded Oriole	<i>Oriolus xanthornus</i>	Benebout/Istikutum	Oriolidae
37.	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Harichacha	Corvidae
38.	Eastern Jungle Crow	<i>Corvus leuallantii</i>	Danr kak	Corvidae
39.	House Crow	<i>Corvus splendens</i>	Pati kak	Corvidae
40.	Barn Swallow	<i>Hirundo rustica</i>	Ababil	Hirundinidae
41.	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Sipai Bulbul	Pycnonotidae
42.	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Bulbuli	Pycnonotidae
43.	Jungle Babbler	<i>Turdoides striata</i>	Chhatore	Leiotrichidae
44.	Jungle Myna	<i>Acridotheres fuscus</i>	Jhut Shalik	Sturnidae
45.	Common Myna	<i>Acridotheres tristis</i>	Shalik	Sturnidae
46.	Purple Sunbird	<i>Nectarinia asiatica</i>	Durga Tuntuni	Nectariniidae
47.	House Sparrow	<i>Passer domesticus</i>	Charai	Passeridae
48.	Baya Weaver	<i>Ploceus philippinus</i>	Bbbui	Ploceidae
49.	Asian Openbill	<i>Anastomus oscitans</i>	Shamuk Khol	Ciconidae
50.	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	Nishi Bok/Bachka	Ardeidae
51.	Indian Pond Heron	<i>Ardeola grayii</i>	Koch Bok	Ardeidae
52.	Cattle Egret	<i>Babulcus ibis</i>	Go Bok	Ardeidae



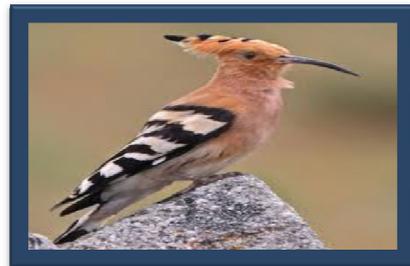
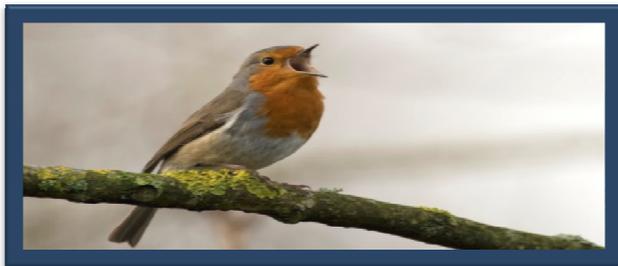


Fig. 22 : Local Birds

10.9 Checklist of Mammals:

Sl. No.	Common name	Scientific name	Bengali name
1	Indian palm squirrel	<i>Funambulus sp.</i>	Kathberali
3	Mole	<i>Heterocephalus glader</i>	Chuncho
4	House mouse	<i>Mus musculus</i>	Indur
5	Rat	<i>Rattus norvegicus</i>	Dhere indur
6	Cat	<i>Felis catus</i>	Biral
7	Dog	<i>Herpestes edwardsi</i>	Neul

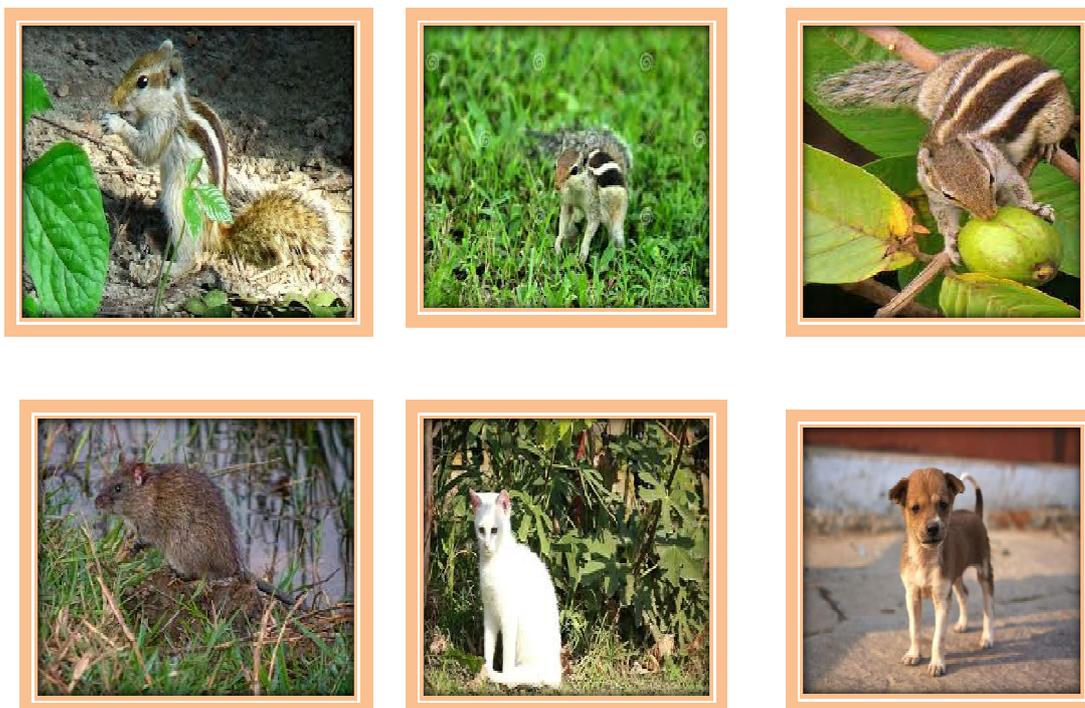


Fig. 23 : Mammals

10.10 Checklist of Ferns and Seasonal Flowers

Sl. No.	Local Name	Common Name	Scientific Name
1.	Fern	Fern	<i>Pteris spp.</i>
2.	Gulab	Rose	<i>Rosa sp.</i>
3.	9 o' clock plant	9 o' clock plant	<i>Portulaca grandiflora</i>
4.	Joba	Hibiscus	<i>Hibiscus rosa-sinensis</i>
5.	Marigold, Ganda	Marigold	<i>Tagetes erecta</i>
6.	Aparajita	Aparajita	<i>Clitoria ternatea</i>
7.	Maiden Pink, China pink	Maiden Pink	<i>Dianthus chinensis</i>
8.	Sandhyamani	Four o clock flower,	<i>Mirabilis jalapa</i>
9.	Nayantara	Periwinkle	<i>Catharanthes roseus</i>
10.	Shiuli	Parijat	<i>Nyctanthes arbor-tristis</i>
11.	Sthalapadma	Confederate rose	<i>Hibiscus mutabilis</i>
12.	Tagar	Tagar	<i>Tabernaemontana divaricata</i>
13.	Madhabilata	Burma creeper	<i>Quisqualis indica</i>





Fig. 24 : Flowering plants of the college premises

10.10 Checklist of Amphibians

Sl. No.	Common name	Scientific Name	Bengali Name
1.	Indian Toad	<i>Duttaphrynus melanostictus</i>	Kuno Byand
2.	Skittering Frog	<i>Euphlyctis cyanophlyctis</i>	Karkati Byang
3.	Asian Bullfrog	<i>Hoplobatrachus tigerinus</i>	Sona Byang



Fig. 25 : Amphibians

10.11 Checklist of Butterflies

Sl. No.	Common name	Scientific Name	Bengali Name
1.	Lemon Pansy	<i>Junonia lemonias</i>	Ushum
2.	Great Eggfly	<i>Hypolimnys bolina</i>	Jamui8
3.	Plain Tiger	<i>Danaus cheysippus</i>	Tamot
4.	Striped Tiger	<i>Danaus genutia</i>	Baghballa
5.	Commoner	<i>Moduza procris</i>	Karanjia
6.	Lime Butterfly	<i>Papilio demolius</i>	Ruru
7.	Common Grass Yellow	<i>Eurema hecabe</i>	Holud
8.	Common Gull	<i>Capora nerissa</i>	Kuchila
9.	Zebra Blue	<i>Laptotes plinius</i>	Zizi
10.	Tailed jay	<i>Graphium agamemnon</i>	Choitak
11.	Psyche	<i>Leptosia nina</i>	Furus
12.	Dark Grass Blue	<i>Zizeeria karsandra</i>	Chhoi
13.	Tiny Grass Blue	<i>Zizula hylax</i>	Tinni
14.	Indian Jezebel (Common Jezebel)	<i>Delias eucharis</i>	Hartoni
15.	Lemon Emmigrant	<i>Catopsilia Pomona</i>	Payrachali
16.	Mottled Emmigrant	<i>Catopsilia pyranthe</i>	Chhitpayra
17.	Common Castor	<i>Ariadne merione</i>	Morchepata
18.	Common Crow	<i>Euploea core</i>	Kaoa
19.	Baron	<i>Euthalia aconthea</i>	Bhushanda
20.	Common Evening Brown	<i>Melanitis leda</i>	Sanjhla
21.			
22.	Common Four-ring	<i>Ypthima huebneri</i>	Charbundi
23.	Common Palmfly	<i>Elymnias hypermnestra</i>	Khyerchak
24.	Peacock Pansy	<i>Junonia almanac</i>	Nayan
25.	Gray Pansy	<i>Junonia atlites</i>	Chandnori
26.	Lime Blue	<i>Chilades lajus</i>	Tura
27.	Pale Grass Blue	<i>Pseudozizeeria maha</i>	Dhupi
28.	Plains Cupid	<i>Chilades pandava</i>	Rulki
29.	Blue Tiger	<i>Tirumala limniace</i>	Himalkuchi
30.	Common Bushbrown	<i>Mycalesis perseus</i>	Jaglabira
31.	Blue Mormon	<i>Papilio Polumnestor</i>	Barunpakha
32.	Common Jay	<i>Graphium doson</i>	Minji
33.	Common Mime	<i>Papila Clytia</i>	Khagra
34.	Common Mormon	<i>Papilo pelytes</i>	Kalim
35.	Common Rose	<i>Pachliopta aristolochiae</i>	Alte

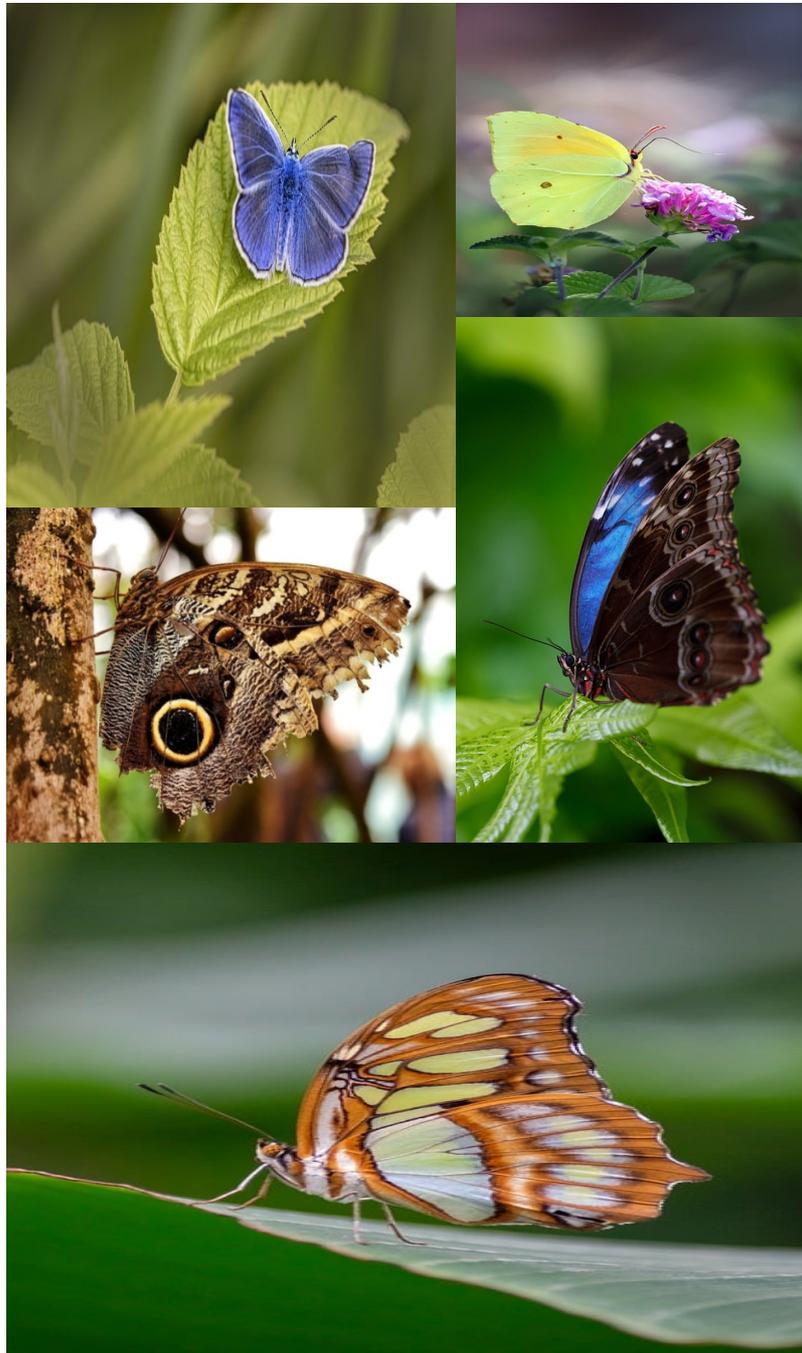


Fig. 26 : Butterfly

CHAPTER - 11

GREEN INITIATIVES

Krishnagar Women's College aims to protect and conserve its biodiversity, fresh and clean ambiance through the following green initiatives to protect and conserve nature.

11.1 Plantation Programme

Plantation programme of Krishnagar Women's College promotes environment management and conservation in the college campus with the following objectives:

- i) To motivate the students to keep their surroundings green and clean by undertaking plantation of trees.
- ii) Promote ethos of conservation of water by minimizing the use of water.
- iii) Motivate students to imbibe habits and life style for minimum waste generation, source separation of waste and disposing the waste to the nearest storage points.
- iv) To create awareness amongst public and sanitary workers, so as to stop the indiscriminate burning of waste which causes respiratory diseases.
- v) To minimize the use of plastic bags, not to throw them in public places as they choke drains and sewers, cause water logging and provide breeding ground for mosquitoes.
- vi) Organize tree plantation programmes, awareness programmes regarding various environmental issues like global warming and educate children about utility of plants.
- vii) Organize Nature Trail in Botanic Garden/Parks/Forest so as to know about the Bio-diversity.



Fig. 27 : Plantation programme

GREEN CAMPUS INITIATIVES :

The total green area of the campus is 13653. 8384 square meters which itself shows the institution lives by the motto, “Green Campus Clean Campus”. The greenery breaks the monotony and gives us a pollution less campus. The integration of flora and fauna within college campus is indispensable. Beyond aesthetics, these living organisms serve a pivotal role: it fosters a conducive learning environment, offering students firsthand experience in biodiversity conservation and ecological balance. Additionally, green spaces enhance mental well-being, providing a respite from academic stress. Moreover, they serve as living laboratories for research and scientific inquiry, enriching academic discourse. Furthermore, preserving indigenous species promotes environmental stewardship and sustainability, instilling values crucial for future generations, fostering a sense of connection to the natural world. The integration of flora and fauna into college campuses not only enhances aesthetics but also cultivates a deeper appreciation for the interconnectedness of life and the environment.



Fig. 28 : Green Initiatives

Apart from the Plantation Programme, many others programs are conducted by the college :

- i) Independence day celebration
- ii) Republic day celebration
- iii) International Yoga Day
- iv) Swachh Bharat Abhiyan
- v) World Environment Day
- vi) Safe Drive Safe Life
- vii) Annual Sports
- viii) Saraswati Puja

11.2 Green computing practice:

Being an academic institution, papers are used for various purposes like exam answer sheets, circulars, notices, office work, document printing, and Xeroxing. Since the trees are cut for paper manufacturing, the sequestration of carbon is reduced increasing carbon footprint. To cut down the carbon footprint, the College administration and various departments follow paperless methods of communication by using emails, online forms submission, etc. The paperless work was helpful in reducing tons of CO₂. Tons of biomass are saved by this green computing practice

CHAPTER – 12

CONSOLIDATION OF AUDIT FINDINGS

Green Audit will create a greater appreciation and understanding of the impact of college activities on the environment. Krishnagar Women's College has successfully been able to identify the impacts on the environment through the various auditing exercises. The green auditing exercise has brainstormed and provided insights on practical ways to reduce negative impact on the environment. Participating in this green auditing procedure has increased knowledge about the need of maintaining sustainability of the college campus. It will create awareness around the use of the Earth's resources in your home, college, local community and beyond. Krishnagar Women's College should adopt an Environmentally Responsible Purchasing Policy and work towards creating and implementing a strategy to reduce the environmental impact through its purchasing decisions.

12.1 Preparation of Action Plan

Management's policies referring to College and approach towards the use of resources need to be considered in purview of green audit report. An environmental policy should be formulated by the management of the college. The college should have a policy on green awareness raising or training programmes for students and staff, seminars on Environment Awareness are often organized by different departments of the institution, green awareness policy right from kitchen staff to procurement policy by the management. Based on the policies, college should have an action plan. The green auditing report will be a base line for the action plan to be evolved.

12.2 Follow up Action and Plans

Green Audit is an exercise which generates considerable quantities of valuable environment and resource management information. The time and effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organization and action plans and implementation programmes will be conducted on the basis of the audit findings.

12.3 Environmental Education

The following environmental education programmes may be implemented in the college before the next green auditing:-

Training programmes in solid waste management, liquid waste management setting up of biodiversity garden, tree management, medicinal plant nursery, vegetable cultivation, water management, energy management, landscape management, pollution mitigation methods, and water filtration methods.

- Give priority to environmental clubs and its programmes
- Conduct exhibition on throw away plastic danger, recyclable products etc.
- Display various slogans and pictures to protect environment.
- Implement chemical treatment system for waste water from the laboratories and incinerators.

Highlight of the measures for maintaining better environment

- Safe drinking water supply has been ensured by installation of sufficient number of water purifier.
- The College has a vegetable garden and a flower garden. Which is very well maintained.
- Electrical installation and internal wiring are well maintained.
- Standard of housekeeping is of very high order. General cleaners through out the college building is very very good.

REGULAR DUSTING AND CLEANING & MULTIPLE WASTE BIN INSTALLATION

Cleanliness is next to godliness” inspired with this motto the college keeps an eye on the cleanliness of the campus with regular dusting, cleaning of the buildings and the washrooms of students and staffs. The institution also has installed many waste bins to keep the campus clean. ‘Clean Campus Drive’, an initiative taken by the NSS Volunteers, KWC. Clean Campus Drive is a positive step towards creating a clean and green campus and promoting a sense of social responsibility among the students. Every year this drive takes place, the NSS volunteers starts the drive early in the morning and works tirelessly to clean the entire college campus. They pick up litter, remove fallen leaves and branches, and clean other areas of the college.



Fig. 29 : Regular Dusting in the College Campus

HAND SANITIZER STAND



Fig. 30 : Hand Sanitizer stand

CHAPTER - 13

CONCLUSION AND RECOMMENDATIONS

Green Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problem. Green Audit is one kind of professional approach towards a responsible way in utilizing economic, financial, social and environmental resources. Green audits can “add value” to the management approaches being taken by the college and is a way of identifying, evaluating and managing environmental risks (known and unknown). There is scope for further improvement, particularly in relation to waste, energy and water management. The college in recent years consider the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the college does perform fairly well, the recommendations in this report highlight many ways in which the college can work to improve its activities and become a more sustainable institution.

13.1 Suggestions

- a) Reduce wastage of water on campus.
- b) The trees planted needs to be managed regularly. Burning should be totally avoided.
- c) Electronic waste should be recycled where possible.
- d) Paperless work should be encouraged as much as possible so as to avoid misuse of wastage of paper.
- e) More use of generators every day should be discouraged

13.2 Recommendations:

- a) The Biodiversity is to be maintained while considering the plantation in future.
- b) Awareness among students and staff about green environment shall be done use tools like display boards.
- c) Flowering plants can be planted through pot on every floor.
- d) Replace incandescent and CFL lamps with LED Light
- e) Plant distribution program in nearby villages and societies should be initiated periodically.
- f) Ensure that green audit is conducted annually. And action is taken on the basis of audit report and recommendation and findings.
- g) The tube lights and LED bulbs are to be cleaned periodically to remove dust and to make them brighter.
- h) A separate enclosure needs to be made for storage of scrap and E-waste materials.
- i) As per the guidelines of Pollution Control Board, (P.C.B.) E-Waste is to be disposed of through approved vendors of the P.C.B.
- j) The College should take steps for disposal through the approved vendors.
- k) Sample of noise level monitoring has been tested and the result shows that the parameters are well within the norm. Periodical testing will be carried out.
- l) Sample of drinking water has been tested and the result shows that the parameters are well within the norm. Periodical testing will be carried out.

Sonar Bharat Environment & Ecology Pvt. Ltd.

Pavimal Sarkar
Director

ACKNOWLEDGEMENT

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2. Dr. Anuradha Chattopadhyay – Convener, Green Audit, Associate Professor,
Department of Philosophy

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Sonar Bharat Environment & Ecology Pvt. Ltd.
Parimal Sarkar
Director



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Certificate number	: IND/QMS/NAB-C3313/3200	2nd Surveillance due	: 13.10.2024
Attachment(s)	: None		


H. Narasimhaiah
Director

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