Green Audit Report
of
RAIDIGHI COLLEGE

2022-2023

INTERNAL QUALITY ASSURANCE CELL (IQAC)

P.O. Ridighi, South 24 Parganas, PIN – 743 383.

CONTENT

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. Raidighi 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 few years back that actively promote various projects for environment 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 Bharat Environment & Ecology Pvt. Ltd.
Parimal 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, Honourable 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 re source 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, 3rd floor, Kolkata - 700012.
Contact Details	033-40031179/033-22113034

Details of Team Member

Sr. No.	Name	Designation/ Technical	TechnicalExperience /Qualification
1	Shri Parimal Sarkar	Legal Expert	➢ 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	➢ 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	➢ Post Graduate Diploma in Energy Management (MBA) ➢ B.Tech (Electrical Engineering)	➢ 15 years experience of Energy audit
2	Shri Gautam Ghosh	➢ Diploma in Mechanical & Electrical Engineering from Calcutta Technical School	➢ 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	➢ M.Tech in Environmental Science ➢ 20 years experience in Environmental Impact Studies and Auditing
4	Amit Poddar	➢ Diploma in Insustrial Safety, M.Sc. Biotechnology from Berharampur College	➢ 27 years experience of working in Industrial Area.
5	P. K. Koley	➢ M.Tech in "Safety and Occupational Health" from BESU (now IIEST)	➢ 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/I-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

RAIDIGHI COLLEGE

2.1 About the College

Raidighi College is a NAAC-accredited co-education college affiliated with the University of Calcutta situated in South 24 Parganas, Raidighi beside the Mani River. This institute started its journey on 16 th May 1995 with the primary motto to make higher education available to the weaker section of society and uplift the rural area through its constant community services. The Raidighi Park, the UNESCO heritage site, Jatar Deul and the largest mangrove in the World, Sundarbans are not far away from this educational institute. The campus has two buildings, a canteen, Girl's Hostel and a field with an adjacent huge pond. There is a medicinal plant garden and a few others varieties of plants, trees and saplings. From time-to-time different natural creatures visit the campus like snakes, birds, bees, butterflies, lizards, chameleons etc. As time is passing an increasing number of trees from surrounding areas are vanishing, and the number of vehicles is increasing which adds to the increased pollution level? Thus, if this trend keeps on increasing then this locality as well as the College has to face the wrath of many more natural calamities like the previous ones for example Fani, Bulbul etc. which leads to huge loss of man and material damage destroying the hard work and advancements made in no time. During such times of difficulty, this College acts as the sole shelter for the local people so protecting the environment in and around the College will not only benefit the stakeholders but also the rural community people.

2.2 History of the College

On May 16th, 1995 at the initiative of some sincere and selfless local people and under the guidance of a number of enthusiasts, Raidighi College started functioning. Time has flown fast and Raidighi College is celebrating its silver jubilee year.

Raidighi College is located in an area which is socio-economically backward. Natural calamities are part and parcel of the people of this locality, students who come to pursue their higher studies are very poor. They sometimes fail to pay the minimum fees of the college. For the development of infrastructure we always look forward the grants allocated by the different Government agencies. College is in urgently in need to develop some infrastructure which are mostly for the welfare of our students.

It needs to be mentioned here that with the help of grants from U.G.C. and Sunderban Development Board construction we have started our girls' hostel from 25 th March, 2018. In the near future, we also wish to construct a similar hostel for boys. These hostels, we are confident, will immediately benefit those students who come to the college from far off areas and are therefore, inconvenienced by the hazards of having to commute long distances to and from the college. Among our future plans is also the construction of an auditorium with adequate seating capacity and all modern facilities. We also give UGC - sponsored remedial coaching classes, a different competitive examinations for entry into services for weaker section of ST, SC and OBC students. We also intend to set up a modern computer training centre in the college itself, which will enable not only the students of the college but the students and eager people of the entire Sundarbans area to receive training in computers and thereby discover new and fresh means to earn their livelihood. We have started a Study Centre of Netaji Subhas Open University, which will enable the students of sundarbans to receive degrees in various post-graduate courses.

The Institute consider social awareness among the students is one of the important aspects to make them a good citizen. NSS's two units in the college have been paving the way in this direction.Volunteers of the NSS units have been doing a lot of works for the upliftment of social awareness among the people of this lineage part of Sundarbans. Health and nutrition oriented programmes and other STDS have been organised. Blood Donation Camp is one of its regular activities. Repairing of roads in the local areas, cleaning of hospital premises, illiteracy eradication programme etc. have been made mandatory for our volunteers.

Our institute believes in overall development of our students-both mental and physical growth. We encourage our students to participate in different sports events both in university level and society level. Our football and kabadi teams (both Boys and girls) are performing excellently and consistently. Our players were selected to play at national level. Students are enthusiastic to participate in other games and sports also. But inadequacy of fund and infrastructure they are not getting optimum opportunity to show their talent

Our students also participate in different cultural competitions. Students of Political Science Department are participating in Youth Parliament and quiz contest every year. They are to be appreciated in this regard. Even living in this remote part of the state, they are capable to win prizes for the college. In near future we are planning to have audio visual classes to train them.

Students of this institution are of first generation learner. They possess little knowledge about co-curricular and extra- curricular activities. Still we have been trying hard to make them aware of other activities of the department. We have been providing them opportunity to write down their own thoughts and imaginations. Wall magazines are the perfect. Example of their creative writing. Already Geography Department has been able to publish 5th editions of its departmental journal. English Department is on the track to publish its 4th edition of its journal' Critique' within a very short period. Other departments are thinking on the same way. A few editions of departmental wall magazine have already been published. Departmental seminars are also very encouraging in our college. Students are getting ready how to deliver lecture. Departmental get-together and educational tour are normal aspect.

Though we do not have experienced any inter-departmental competitions, but it has been found that students use to participate in different events departmentally. Quiz contest and debate 'competitions are the finest example of such activities. Our students use to organise 'Teachers' Day' programme every year both centrally and departmentally. The college also organizes Annual competition in music, recitation, extempore speech and debate.

The Learning parameter is so high that new students are learning very quickly from our elder students. We have strong faith on our students that in the near future our students will definitely develop themselves to that extent that we will be able to produce them at any arena.

2.3 Vision & Mission of the College:

Vision of the College:

The vision of the College is to carve a niche for itself as a premier institution offering quality education to the poverty-stricken, under-developed community of rural marshlands of Sundarban.

The college endeavors to strengthen character, broaden mind, dispel superstition, impart moral values and consequently develop generations of worthy and responsible human beings who will build our future society. We want our students to contribute constructively towards nation-building by upholding the values of secularism, national integration and social commitment. We have a vision that the students coming out of our campus should be intellectually enlightened, emotionally sound, physically strong and practically efficient. We envision them to champion the cause of justice, truth and peace and be always open to further growth to attain the Absolute.

The challenges are infinite. Majority of the population belongs to socially and financially underprivileged category. A significant section belongs to impoverish minority groups. Their daily struggle to make both ends meet often becomes a hindrance to the process of learning. The rural position of the college, poor communication and the perpetually under developed locality are also key concerns. The area is threatened by cyclones and floods every monsoon and suffers from lack of basic facilities, e.g., inadequate power supply (which makes it extremely difficult to advance technologically). The nearest railway station is 24 km away and many students are dependent on irregular and infrequent ferry services across the nearby Moni river to reach the college. The proximity of the border area also has its disadvantages. Bright students from local families often cannot cope with these unending handicaps and prefer to migrate away from the locality for higher education. As a result, the general quality of input students in the college is unfortunately not very high. This renders the journey towards academic excellence extremely challenging. With better communication, sufficient infrastructure and more modern learning resources at its disposal, the college would have attracted more quality students. Nevertheless, Raidighi College is marching ahead with its sole objective of providing quality education to its rural, needy, academically backward students irrespective of their caste, creed, religion, gender and economic status.

Mission of the College:

Raidighi College was established with a single mission ~ to cater higher education to the poverty-stricken, under-developed community of this region and to develop the students into self-sufficient and responsible citizens through comprehensive education based on carefully prepared and well designed curriculum. Our mission is to impart quality education and exposure to the students and equip them to cope with the latest requirements, through innovative techniques and practices. We are confident that proper education is the best resort to uplift the youth in the rural and backward areas, and we are committed to facilitate meaningful education for our students, coming from far-away islands of the Sunderbans.

2.4 Campus Infrastructure:

Raidighi 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 16188 Sq. Mtr. Acre. The college following facilities are available:

- Digital Library
- Play Ground :
- Cycle Stand :
- Purified Drinking Water :
- Canteen :
- Smart Class Room
- Free Internet and CCTV Cameras installed :
- Hospital/Medical Facilities **:**

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.

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, RAIDIGHI COLLEGE, SOUTH 24 PARGANAS, WEST BENGAL.

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 landscapes.

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 Raidighi College, located behind ESI Office & Panchayat Office, Raidighi, District – South 24 parganas, West Bengal, geographically lies between 21°59'29.28"N and 88°26'24.08"°E. The College has a total of 16188 Sq. Mtr. 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 9219 Sq. Mtr. which includes Academic/ Administrative building, computer lab, toilets, classroom, common room, canteen and parking area. The remaining 6969 Sq. Mtr. 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 Raidighi 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	12488
GROUND COVERAGE	3700
TOTAL LAND AREA	16188

Ground coverage of 22.86% (i.e 3700 sq metres) consists of the buildings.

FINDINGS:

Raidighi College, which was established in the year 1924, 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 77.14% 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

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Mob. No. : 9831287086
9830093976

Qualissure Laboratory Services

NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

DOC. NO. : QLS/SAMP/TR-13/00

TEST REPORT

Name & Address Of the Customer : Raidighi College, Raidighi, South 24 Parganas, PIN – 743 383.	Report No.	: QLS/MR/W/23-24/C/426
	Date	: 30.05.2023
	Sample No.	: QLS/MR/W/23-24/426
	Sample Description	: Drinking Water
	Sample Location	: Tube Well
	Sample Drawn On	: 18.05.2023
	Date of Performance	: 19.05.2023 - 27.05.2023

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	7.57
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	260
4.	Calcium(as Ca) in mg/l	IS 3025 (Part 40): 1991(RA 2019)	75	200	39.5
5.	Chloride(as Cl) in mg/l	IS 3025 (Part 32): 1988 (RA 2019)	250	1000	45.0
6.	Iron (as Fe) in mg/l	IS 3025 (Part 53): 1988(RA 2019)	1.0	No Relaxation	0.22
7.	Magnesium(as Mg) in mg/l	APHA 24th Edition- 2023, 3500 Mg	30	100	20.0
8.	Nitrate (as NO_3) in mg/l	IS 3025 (Part 34): 1988(RA 2019)	45	No Relaxation	<0.2
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	28.5
11.	Alkalinity (as $CaCO_3$) in mg/l	IS 3025 (Part 23): 1986(RA 2019)	200	600	196.8
12.	Total Arsenic(as As) in mg/l	IS 3025 (Part 37): 1988 (RA 2019)	0.01	No Relaxation	<0.02
13.	Total Hardness (as $CaCO_3$) in mg/l	IS 3025 (Part 21): 2019	200	600	182.1

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By
Soumy Chakraborty, Microbiologist
(Authorized Signatory)

for Qualissure Laboratory Services
Reviewed & Authorized By
Bidhnupriya Banerjee, Chemist
(Authorized Signatory)

End of Report

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- *This Test Report shall not be reproduced without the permission of Qualissure Laboratory Services.*
- *The reserved part of sample(s), except perishable sample(s), shall be retained for 30 days from the date of issue of the Test Report.*

Fig. 1 : Drinking water sample collection

Water Storage tank

Fig. 2 : Water Storage Tank

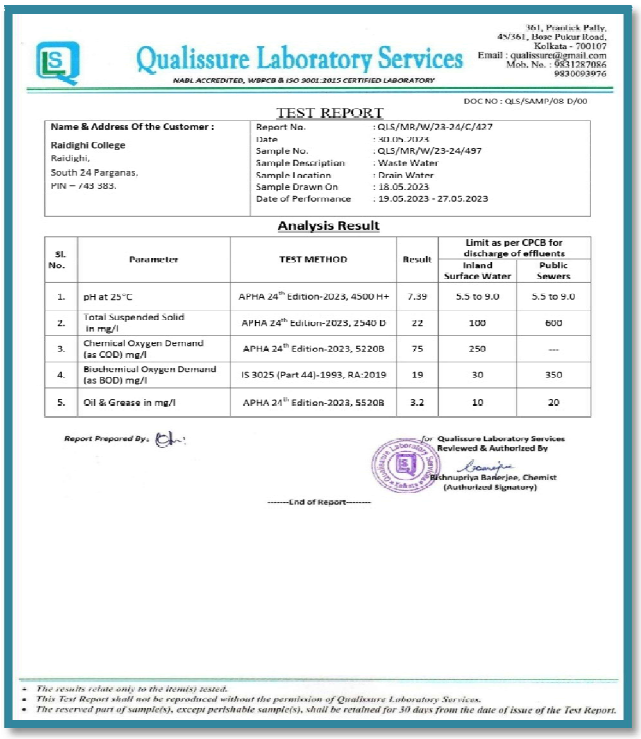
SOURCES OF WATER

• From Borewell

Total requirement 15000 Ltr. of water is drawn from the Borewell installed in the campus.

The total water consumption in the Campus is 18000 litres per day. The per capita utilization of the College is 4.79 Litres per day. The utilizations of such a huge resource of water include usage for drinking, cleaning, laboratory use, garden use.

WASTE WATER TEST REPORT



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NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

DOC NO : QLS/SAMP/08 D/00

TEST REPORT

Name & Address Of the Customer :		
Raidighi College Raidighi, South 24 Parganas, PIN – 743 383.	Report No. Date Sample No. Sample Description Sample location Sample Drawn On Date of Performance	: QLS/MR/W/23-24/C/427 : 30.05.2023 : QLS/MR/W/23-24/497 : Waste Water : Drain Water : 18.05.2023 : 19.05.2023 - 27.05.2023

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+	7.39	5.5 to 9.0	5.5 to 9.0
2.	Total Suspended Solid in mg/l	APHA 24th Edition-2023, 2540 D	22	100	600
3.	Chemical Oxygen Demand (as COD) mg/l	APHA 24th 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 24th Edition-2023, 5520B	3.2	10	20

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By
Bidhnupriya Banerjee, Chemist
(Authorized Signatory)

-------End of Report--------

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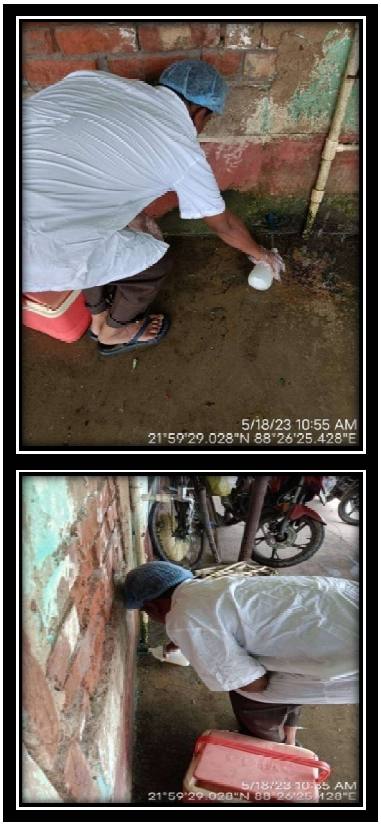


Fig. 3 : Waste water sample collection

CHAPTER – 6

AMBIENT AIR QUALITY ASSESSMENT AND MANAGEMENT

6.1 Air Quality Test Report

361, Prantick Pally,
45/361, Bose Pukur Road,
Kolkata - 700107
Email : qualissure@gmail.com
Mob. No. : 9831287086
9830093976

Qualissure Laboratory Services

NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

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

TEST REPORT

Name & Address Of the Customer.	Report No. : QLS/MR/A/23-24/C/411
Raidighi College	Date : 30.05.2023
	Sample No. : QLS/MR/A/23-24/411
Raidighi, South 24 Parganas.	Sample Description : Ambient Air
PIN – 743 383.	Sample Mark : Near Main Gate
	Date of Performance : 19.05.2023 to 27.05.2023

Analysis Result

Location : Near Main Gate	Date of sampling : 18.05.2023
Sampling Done by : J. Sahana	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear & Sunny	Average Temperature : 30°C
Barometric Pressure : 754 mm of Hg	Average Humidity : 62%

Sl. No.	Pollutants	Result	Limit as per CPCB	Method of Test Reference
1	Particulate matter (<10μm) in μg/m³	76	100	IS: 5182 (Part-23), RA-2017
2	Particulate matter (<2.5μm) in μg/m³	36	60	USEPA CFR-40, Part-50, Appendix-L
3	Sulphur dioxide (SO_2) in μg/m³	7.1	80	IS: 5182 (Part-2)-2001, RA-2017
4	Nitrogen dioxide (NO_2) in μg/m³	31.3	80	IS: 5182 (Part- 6)-2006, RA-2017
5	Carbon Monoxide (CO) in μg/m³	741	2000	IS: 5182 (Part-10):1999, RA-2014

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By
Bishnupriya Banerjee, Chemist
(Authorized Signatory)

-----End of Report-----

- The results relate only to the item(s) tested.
- This Test Report shall not be reproduced without the permission of Qualissure Laboratory Services.
- The reserved part of sample(s), except perishable sample(s), shall be retained for 15 days from the date of issue of the Test Report.

Fig. 4 : 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 CO_2 and release enough fresh O_2 across the Campus. The result shows that RC Campus's air quality status is very good as compared to other locations. It is identified that RC 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.

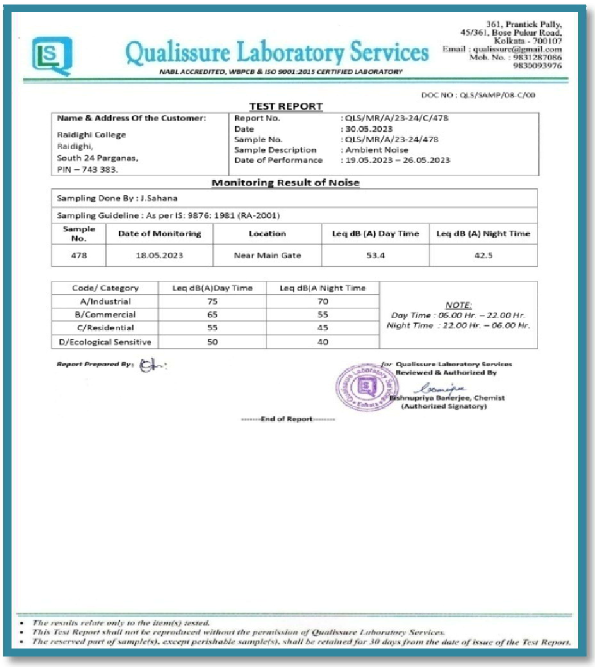
Sources of air pollution: It was observed and revealed from data that the only possible sources of pollution in the College campus are as use of diesel / petrol vehicles, air-conditioners, power generator, kitchen waste and other biodegradable waste from canteen, use of electronic appliances and other. 20 student & employees use two wheeler and 100 Student use in Bi-Cycle & rest of 3008 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.



Qualissure Laboratory Services
NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

361, Prantick Pally,
45/361, Bose Pukur Road,
Kolkata - 700107
Email : qualissure@gmail.com
Mob. No. : 9831287086
9830093976

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

TEST REPORT

Name & Address Of the Customer:	
Raidighi College Raidighi, South 24 Parganas, PIN – 743 383.	Report No. : QLS/MR/A/23-24/C/478 Date : 30.05.2023 Sample No. : QLS/MR/A/23-24/478 Sample Description : Ambient Noise Date of Performance : 19.05.2023 – 26.05.2023

Monitoring Result of Noise

Sampling Done By : J.Sahana

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
478	18.05.2023	Near Main Gate	53.4	42.5

Code/ Category	Leq dB(A)Day Time	Leq dB(A Night Time
A/Industrial	75	70
B/Commercial	65	55
C/Residential	55	45
D/Ecological Sensitive	50	40

NOTE:
Day Time : 06.00 Hr. – 22.00 Hr.
Night Time : 22.00 Hr. – 06.00 Hr.

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By
Bishnupriya Banerjee, Chemist
(Authorized Signatory)

--------End of Report--------

- *The results relate only to the item(s) tested.*
- *This Test Report shall not be reproduced without the permission of Qualissure Laboratory Services.*
- *The reserved part of sample(s), except perishable sample(s), shall be retained for 30 days from the date of issue of the Test Report.*

Fig. 5 : 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 0.64% of students & Teacher are using Motor Cycle and 3.20% of student use Cycle & rest of 96.16 of student & Teacher 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

RAIN WATER HARVESTING SYSTEM

A vital environmental concern has been addressed recently by developing Rain Water Harvesting system. Arrangements have been made for collection of rain water from the rooftop, roads and paved are as, Collected water is stored in above ground tank from where it is used for maintenance of greenery.

Fig. 6 : Rain water harvesting tank

CHAPTER – 9

ENERGY AUDIT

Source of Energy

RC 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

Fig. 7 : DG Set

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 2022 to June 2023 were available for review (average consumption 2806 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

9.1 General Details:

Sl.No.	PARTICULARS	DETAILS	
1	Name & Address of College	Raidighi College P.O. Raidighi, South 24 Pargans – 743 383.	
	Web Site	www.raidighicollege.in	
2	Name of Contact Officer	Dr. Sasabindu Jana	
	Designation	Principal	
	Name of Alternative Officer	Dr. Madhumita Majumder (Assistant Professor HOD, Dept. of Botany)	
	Designation	Assistant Professor – HOD, Dept. of Botany	
3	Telephone No. Mobile No.	NA 8777239612	
	Fax No. e-mail ID	raidighicollege95@gmail.com	
	No. of shift	10A. TO 5 PM	
	No. of Employees (Approx)	72	
4	Electricity Consumption/month	Imported (Purchased) 2806	
5	Specific Energy Consumption	Fuel	Electricity
		7790.16	Rs. 49,457/- (Per month)
6	LPD	3.6 W/sf.	
7	EPI	0.75	

8.2 Electrical Details

a) Transformers

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

b) Electricity Consumption

	Particulars	Demand
A	Contract demand KVA	113
B	Maximum demand	113
C	Total Energy units consumed / year	36484
D	Avg. Power Factor(P.F.)	0.97
E	Avg. Energy bills(Rs/month)	Rs.6,42,946/-

c) Detailed list of Electric Motors operating in the college

S.NO.	NAME OF THE PLANT	RATING OF MOTOR (KW)	NO. OF MOTORS
1	Raidighi College, Raidighi	7.4	2 nos.

d) **Connected Load**

	EQUIPMENT	TOTAL NUMBERS	LOAD IN KW (TOTAL)
A	Motors : Greater than 10kW	NIL	NIL
	: Less than 10 kW	2Nos.	7.4 KW
B	AC & Ventilation with TR capacity		
a)	Others (Package ACs/ Split ACs / Windows ACs) with TR	**Room AC of Split/Window type –** 9 Nos. 31.59 KW	
C	Total Process Load (in kW)	38.99 KW	
D	Total Lighting Load (in kW) & Luminaries details	**No's of lighting luminaries** (LED+T/L+ (including fan) Tube Light, Led Light, Metal etc.= 24.44 KW Electric Fan - 10.25 KW	
	Total Load (in kW)	**73.68 kw**	

A. Lux Measurements :

Sl.no.	Room	LUX level	Remarks
1.	AJC Bose Bhavan		
	Ground Floor	272,262,259.252,267,271	
	1st floor	269,284,273,269,276,280	
	2nd floor	263,266,264,272,276,270	
2.	Swami Vivekananda Bhavana	**LUX level**	
	Ground Floor	253,267,271,262,254,254	
	1st floor	277,261,260,258,253,262	
	2nd floor	260,246,253,246,272,281	
	3rd floor	263,275,256,269,277,268	

Illumination Level Comparison

Area	Average Lighting Level (LUX)	NBC Recommended
AUJC Bose Bhavan	269	300-500
Swami Vivekananda Bhavana	262	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

9.3 Use of Alternate Energy

A roof top solar panel of array capacity of 20 kw power supply has been installed funded from WB Renewable Energy Development Agency at Raidighi College by M/s. Larsen & Turbo Ltd. On 26.06.2022. this bi-directional meter has been installed with Solar PV module of Adani make of 325 Wp of each module, consists of 62 nos. of total such modules, along with energy meter, array junction box, inverter interfacing panel, grid interfacing panel, earth pit chamber, data logger, net meter and fire fighting system. All the structural components are non magnetic SS304, inverter and grid interfacing panels are L&T and LS Power control Ltd. Make. Earthing cable are 3 m long with 50 mm diameter with 10SWG GI wire. Fire extinguisher is installed with 6kg dry ABC type 1 stand with 4 buckets.

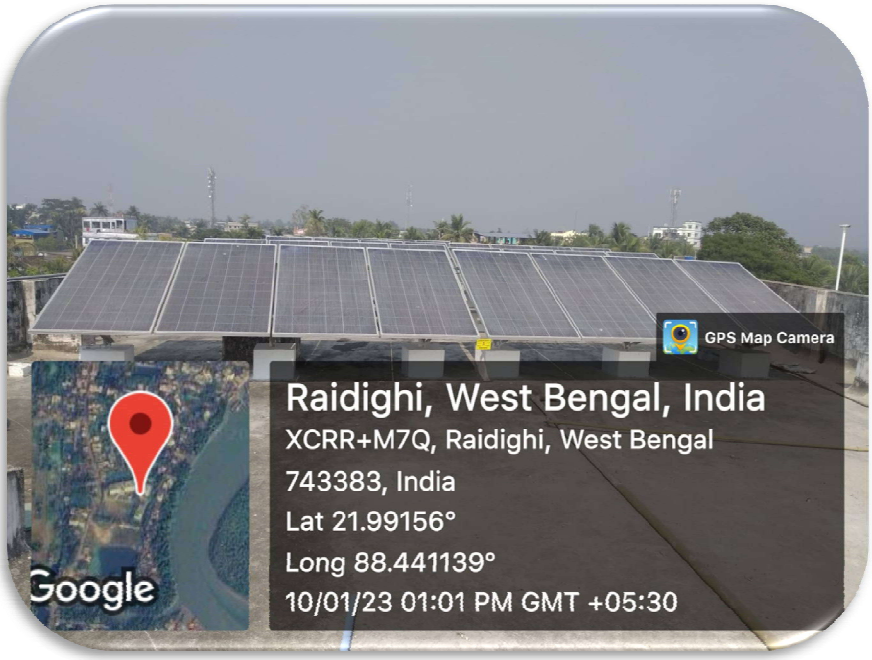


Fig. 8 : Solar system

CHAPTER - 10

WASTE MANAGEMENT

The present Honourable 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.

10.1 Solid Waste

For collection of solid waste, separate bins have been placed at selected locations. Solid waste is dumped in a sludge pit.

System of collection & disposal of solid waste centrally does not exist in the Panchayet area where the College is located.

Fig. 9: Solid Waste

9.2 Liquid Waste

Waste water from toilet etc are disposed through septic tank. Waste water from other points are discharged in panchayat drains.

9.3 E-Waste

Substantial qualtity 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.

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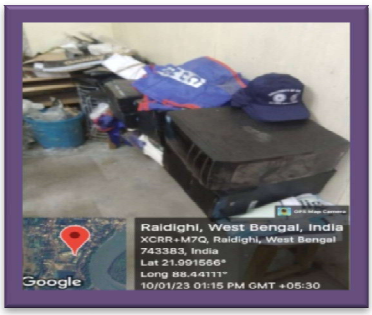


Fig. 10 E-Waste

A MOU agreement has been signed with M/s. Hulladek Recycling Pvt. Ltd. On 14/09/2022 to dispose of the Solid, Liquid and E-waste to this organisation.

भारतीय गैर न्यायिक

दस रुपये रु.10

TEN RUPEES Rs.10

INDIA

INDIA NON JUDICIAL

पश्चिम बंगाल WEST BENGAL 69AB 180628

SERVICE AGREEMENT FOR E-WASTE MANAGEMENT

The Agreement is entered into at Kolkata on this 14 day of September, 2022

By and Between

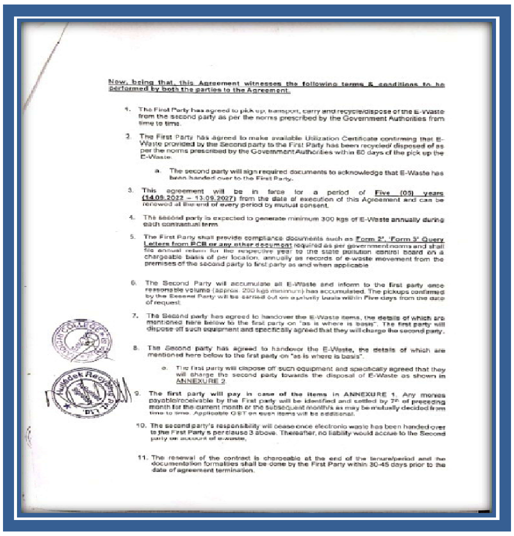
Hulladek Recycling Private Limited, a company incorporated under the Companies Act 2013 having its registered office at 4, D.L. Khan Road, Flat No. B-401, 4th Floor, Kolkata-700025, West Bengal, India (hereinafter referred to as First Party which expression shall unless contrary to and or repugnant to the context mean and include its successors representative and permitted assigns through Mr. Nandan Mall to enter into and sign this Agreement for and on behalf of the First Party.

AND

Raidighi College established in 1995, is an undergraduate college in Raidighi, West Bengal. It is affiliated with the University of Calcutta having its premises at P.O.+P.S. Sub. Division: Diamond Harbour,24 Paraganas(South) Raidighi, West Bengal 743383. There in after referred to as Second Party which expression shall unless contrary to and or repugnant to the context mean and include its successors representative and permitted assigns through Dr.Sasabindu Jana (Principal) to enter into and sign this Agreement for and on behalf of the Second Party.

A.) First Party is a registered Producer Responsibility Organization (PRO) vide The Registration No. B-29016(12)/(PRO)/18/WM-III Division dated 12.11.2018 valid up to 12.11.2023 and is authorized to undertake activities prescribed for Producer Responsibility Organizations.

B.) The Second Party in compliance of E-Waste Management Rules, 2016 & 2022 desires to have services for management of their Electronic Waste except liquid waste.



Now, being that, this Agreement witnesses the following terms & conditions to be performed by both the parties to the Agreement.

1. The First Party has agreed to pick up, transport, carry and recycle/dispose of the E-Waste from the second party as per the norms prescribed by the Government Authorities from time to time.
2. The First Party has agreed to make available Utilization Certificate confirming that E-Waste provided by the Second party to the First Party has been recycled/ disposed of as per the norms prescribed by the Government Authorities within 60 days of the pick up the E-Waste.
   a. The second party will sign required documents to acknowledge that E-Waste has been handed over to the First Party.
3. This agreement will be in force for a period of Five (05) years (14.09.2022 – 13.09.2027) from the date of execution of this Agreement and can be renewed at the end of every period by mutual consent.
4. The second party is expected to generate minimum 300 kgs of E-Waste annually during each contractual term.
5. The First Party shall provide compliance documents such as Form 2', 'Form 3' Query Letters from PCB or any other document required as per government norms and shall file annual return for the respective year to the state pollution control board on a chargeable basis of per location, annually as records of e-waste movement from the premises of the second party to first party as and when applicable.
6. The Second Party will accumulate all E-Waste and inform to the first party once reasonable volume (approx. 200 kgs minimum) has accumulated. The pickups confirmed by the Second Party will be carried out on a priority basis within Five days from the date of request.
7. The Second party has agreed to handover the E-Waste items, the details of which are mentioned here below to the first party on "as is where is basis". The first party will dispose off such equipment and specifically agreed that they will charge the second party.
8. The Second party has agreed to handover the E-Waste, the details of which are mentioned here below to the first party on "as is where is basis".
   a. The first party will dispose off such equipment and specifically agreed that they will charge the second party towards the disposal of E-Waste as shown in ANNEXURE 2
9. The first party will pay in case of the items in ANNEXURE 1. Any monies payable/receivable by the First party will be identified and settled by 7th of preceding month for the current month or the subsequent month/s as may be mutually decided from time to time. Applicable GST on such items will be additional.
10. The second party's responsibility will cease once electronic waste has been handed over to the First Party's per clause 3 above. Thereafter, no liability would accrue to the Second party on account of e-waste.
11. The renewal of the contract is chargeable at the end of the tenure/period and the documentation formalities shall be done by the First Party within 30-45 days prior to the date of agreement termination.

Fig. 11: E-Waste Agreement Copy

12. Records & data of the e-waste material procured will be maintained and transparently shared by the first party.
13. The Second Party has agreed that the general waste such as municipal solid Waste will not be included in the E Waste.
14. It is clearly agreed that all the E-waste procured by or in the possession of the second party will be exclusively managed by the first party as per the terms and conditions specified above.
15. The First Party shall conduct an 'Awareness Session' at the premises of the 'Second Party' for generating awareness about the benefits and process of e-waste recycling.
   a. The second party then shall prepare and share with first party an Awareness report to be submitted the West Bengal pollution control board.
16. Refund and Termination : During the tenure in case The First Party Fails to Deliver any of the services mentioned or any operational service failure Then it shall be a liable cause for Termination of the Agreement by the Second Party post which the balance advance amount for the year of 2022-2027 shall be refunded by the First Party to the Second Party without any interest.

"First Party"
M/s. Hulladek Recycling Private Limited
Authorized Signatory
(Mr. Nandan Mall)
Witness: -
1)

"Second Party"
Raidighi College
Authorized Signatory
Dr. Sasabindu Jana (Principal)
DR. SASABINDU JANA
PRINCIPAL
RAIDIGHI COLLEGE
Raidighi, 24 Pgs(S), Pin-743383
Witness: -
1)

Hulladek Recycling Private Limited
5, Deshpran Sashmal Road, Kolkata 700033
1800-212-7880 | 9903028800
www.hulladek.in | help@hulladek.re

Hulladek
Hungry for Waste

Payment Terms : The Second Party has agreed to pay an "agreement fee" of ₹ 7,000 /- + 18%GST annually to the first party as fee for the contract Total of ₹ 35,000 /- + 18%GST to be paid one time in advance for Five (05) years . for 5 years of the E-waste Awareness Session included.

Annexure 1

List of Waste Ewaste & Plastic Waste Items (Scrap/Non-Working)

The FIRST PARTY shall pay to the SECOND PARTY for the following items listed below :

Particulars	Weight	Price Paid by Hulladek Recycling to Raidighi College
Electronic Items (Scrap/Non-Working)	In Kgs	(Inclusive of all applicable taxes)
Mixed IT scrap lot	On Actuals	₹ 20.00 / kgs
Mixed Electricals	On Actuals	₹ 35.00 / kgs
UPS Battery	On Actuals	₹ 70.00 /kgs
Industrial Battery	On actuals	₹ 80.00 / kg
Copper Cables	On actuals	₹ 60.00 / kg
Aluminum Cables	On actuals	₹ 50.00 / kg
Air Conditioners	On actuals	₹ 50.00 / kg
Cables	On actuals	₹ 8.00 / kg
Motors (AC/DC)	On actuals	₹ 50.00 / kg
Small Miscellaneous & Consumer Items	On actuals	₹ 10.00 / kg

"First Party"
M/s. Hulladek Recycling Private Limited
Authorised Signatory
(Mr. Saidan Mati)

"Second Party"
Raidighi College
Authorised Signatory
DR. SAGARIKA MUKHOPADHYAY
PRINCIPAL
RAIDIGHI COLLEGE
Raidighi, 24 Pgs(S) Pin 743373

GSTIN: 19AADCH4384E1ZI
CPCB REGISTRATION NO.: B-29016(12)/(PRO)/18/WM-III Division

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Fig. 12 E-Waste & Plastic waste item

Hulladek Recycling Private Limited
Deshpran Sashmal Road, Kolkata 700033
1800-212-7880 | 9903028800
www.hulladek.in | help@hulladek.re

Hulladek
Hungry for Waste

The SECOND PARTY shall pay to the FIRST PARTY for the following items listed below :

Lighting Equipment (Scrap/Non-Working)

Particulars		Weight/piece	Number of Pieces/kg	Price Charged by Hulladek Recycling To Raidighi College (Inclusive of all applicable taxes)
Item	Description			
Tubelight	Big	0.030 kgs	34 units	₹ 40.00 / kg
Tubelight	Small	0.020 kgs	50 units	₹ 40.00 / kg
Pl bulb		0.025 kgs	40 units	₹ 40.00 / kg
Lamps		0.050 kgs	20 units	₹ 40.00 / kg
CFL Bulb		0.025 kgs	40 units	₹ 40.00 / kg
Incandescent bulb	AAA Battery	0.011 kgs	91 units	₹ 40.00 / kg
Pencil battery	AA battery	0.023 kgs	44 units	₹ 40.00 / kg
Pencil battery	C battery	0.018 kgs	55 units	₹ 40.00 / kg

"First Party"
M/s. Hulladek Recycling Private Limited
Authorised Signatory
(Mr. Saidan Mati)

"Second Party"
Raidighi College
Authorised Signatory
DR. SAGARIKA MUKHOPADHYAY
PRINCIPAL
RAIDIGHI COLLEGE
Raidighi, 24 Pgs(S) Pin 743373

GSTIN: 19AADCH4384E1ZI
CPCB REGISTRATION NO.: B-29016(12)/(PRO)/18/WM-III Division

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CHAPTER - 11

ENVIRONMENT AUDIT

BIODIVERSITY STATUS OF THE COLLEGE CAMPUS

11.1 Introduction

Raidighi 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.

11.2 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 from with different parts of South 24 parganas district by bus and local trains. Lot of bus services from Kolkata, is available here. The nearest railway station is Mathurapur Road, near abount 20 km from Raidighi. The nearest international and domestic airport is Netaji Subhas Chandra Bose International Airport of Kolkata.

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Location of the College

The College is located at nearest Raidighi Bus Stand, address is P.O. & P.S. : Raidighi, Dist. South 24 parganas, PIN – 743383.

.Location Map

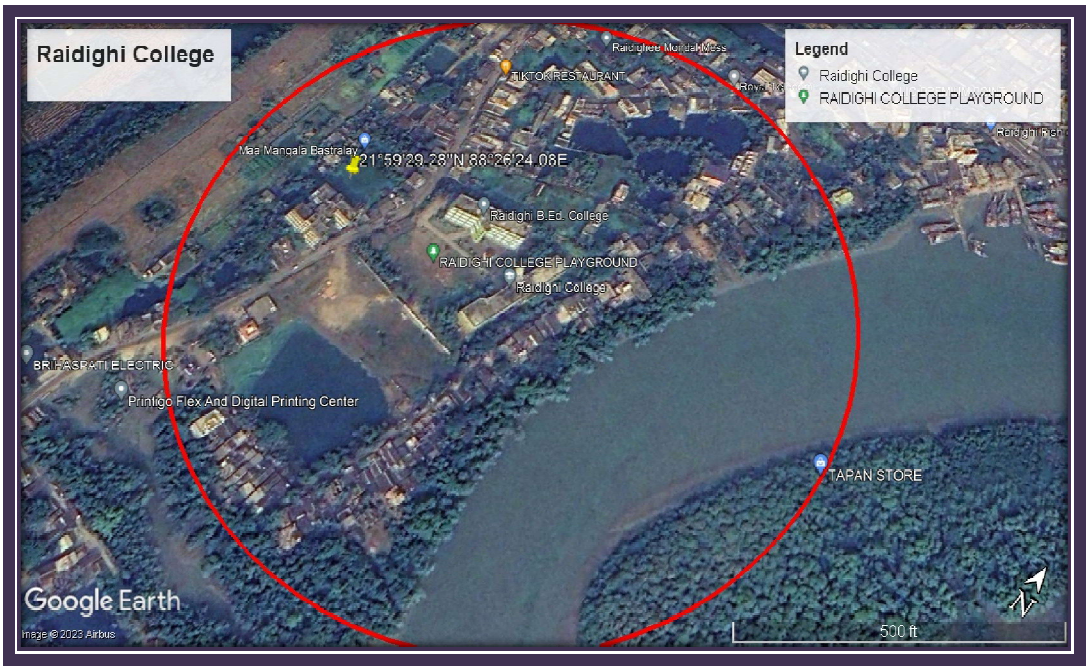


Fig. 13 : Location Map

11.3 Method of Study

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

a) Sampling was done mostly is 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. slogs and snails are more conspicuous during wet weather and especially at night when they were found using torch.

11.4 Plant diversity in the College Campus

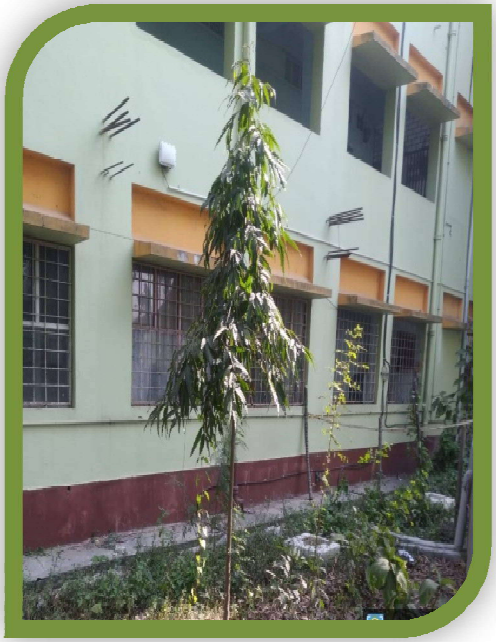
Actually, the college campus is eco-friendly with rich flora of bryophyte, pteridophytes, gymnosperms and flowering plants like trees, shrubs, herbs, grasses and aquatic plants too. The herbs mostly recorded are naturally grown in the campus. These plants are listed and depicted as following:

These plants are listed and depicted as following:

List of the Plants of College Campus

Tree

Sl.No.	Scientific name of the Plants	Family	Local/Common Names
1	*Casuarina equisetifolia* L.	Casuarinaceae	Jhau/Australian Pine
2	*Thespesia populnea* Corr.	Malvaceae	Paresh pipul /Indian Tulip
3	*Eucalyptus citriodora* (Hook.) K.D. Hill & L.A.S. Johnston	Myrtaceae	Lemon Scented Gum
4	*Alstonia scholaris* B. Br.	Apocynaceae	Saptaparni/Chhatim
5	*Callistemon linearis* Schrad.	Myrtaceae	Bottlebrush
6	*Mangifera indica* L.	Anacardiaceae	Aam, Mango
7	*Mimusops elengi* L	Sapotaceae	Bokul
8	Neolamarckia cadamba(Roxb.) Bosser	Rubiaceae	Kadam
9	*Acacia auriculiformis* A. Cunn. ex. Benth.	Fabaceae	Akashmoni/Sonajhuri
10	Monoon longifolium(Sonn.)B.Xue & R.M.K.Saunders	Annonaceae	Debdaru
11	*Livistona chinensis* (Jacquin.) R. Brown ex Martius	Arecaceae	Chinese Fan Palm/Fountain Palm
12	*Ficus religiosa*	Moraceae	Asath tree
13	*Terminalia arjuna* (Roxb.) Wight & Arn.	Combretaceae	Arjun
14	*Ziziphus jujuba*	Rhamnaceae	Tal/ Fan Palm
15	*Phyllanthus emblica* L.	Euphorbiaceae	Amlaki



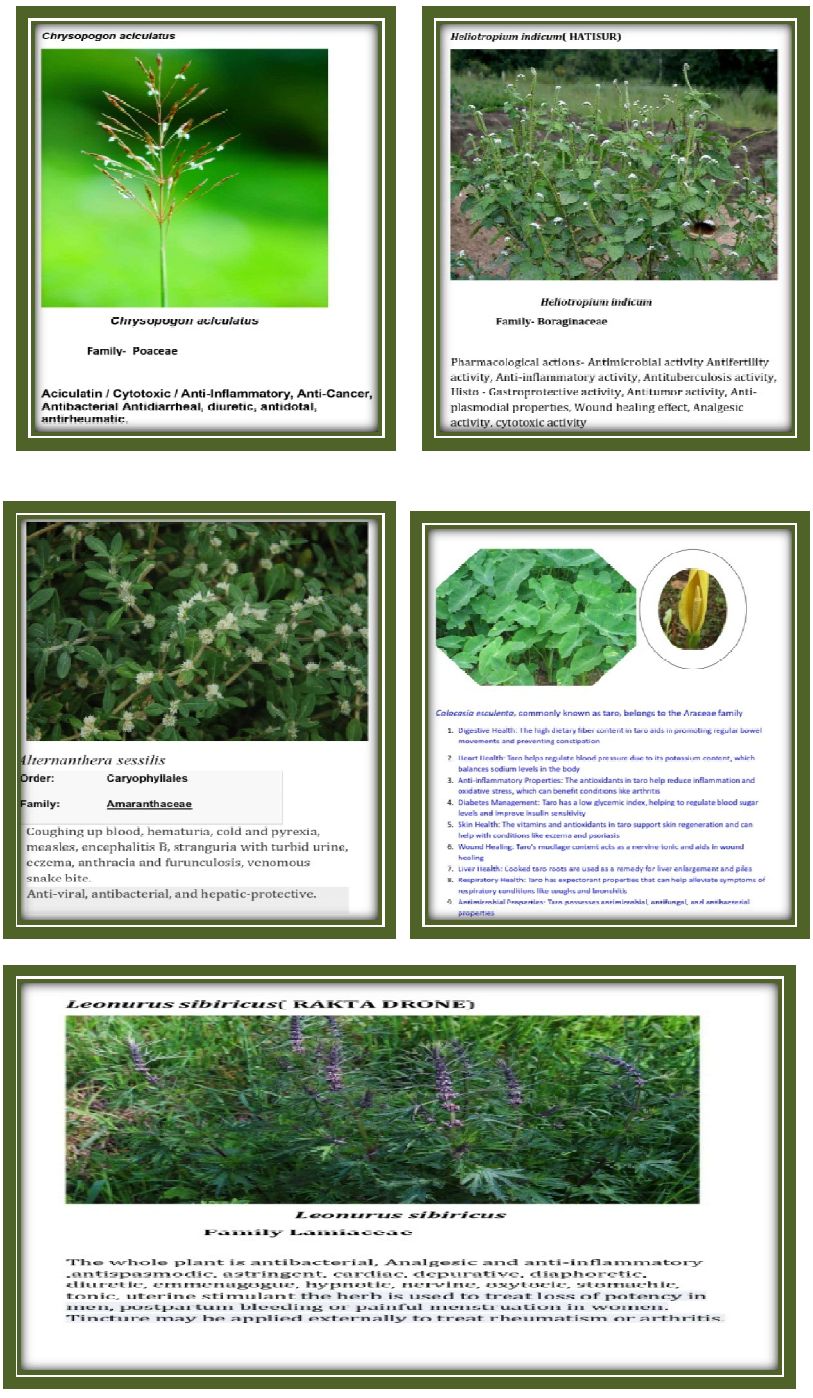


Fig. 14 : Major plants in the campus area

Shrubs

Sl. No	Scientific name of the Plants	Family	Local/Common Names
1	*Murraya exotica* L.	Rutaceae	Kamini
2	*Hibiscus rosa-sinensis* L.	Malvaceae	Jaba/China rose
3	*Gardenia jasminoides J.Ellis*	Rubiaceae	Gandharaj
4.	*Nerium oleander* L	Apocynaceae	Karabi

Gymnosperm

Sl. No	Scientific name of the Plants	Family	Local/Common Names	Remarks
1	*Cycas circinalis*	Cycadaceae	Cycas	Ornamental
2	*Zamia* sp	Zamiaceae		Ornamental
4.	*Thuja* sp	Cupressaceae	Jhau	Ornamental

Bryophyta

Sl. No	Scientific name of the Plants	Family	Local/Common Names
1	*Cyathodium* sp	Targioniaceae	
2	*Semibarbula* sp	Pottiaceae	Velvet moss

Lichen

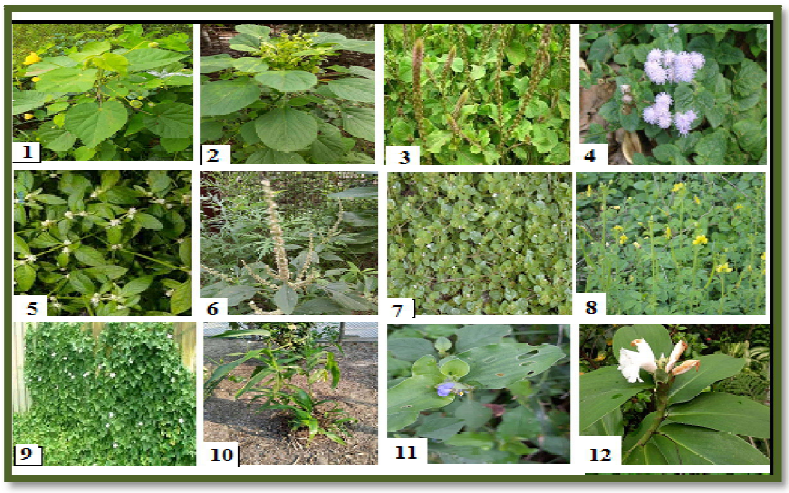
Different Crustose lichens are found to grown over the several tree trunks of the college.

It is well known that lichen is the symbiotic association between algae and fungi and a very important indicator of pollution-free environment.

Crustose Lichen growing on tree bark in college campus

Herbs

Sl.No.	Scientific name of the Plants	Family	Local/Common Names
1	*Nicotiana plumbaginifolia* Viv.	Solanaceae	Bontamak
2	*Phyla nodiflora*(L.)Greene	Verbenaceae	Bhuin-okra
3	*Nasturtium indicum* (L)DC.	Brassicaceae	Bon-sorse
4	*Physalis minima* L.	Solanaceae	Bon- tepari
5	*Solanum nigrum* L.	Solanaceae	Kakmachi
6	*Solanum sisymbriifolium* Lam.	Solanaceae	Kanta- begun
7	*Oldenlandia corymbosa* L.	Rubiaceae	Khetpapra
8	*Oxalis corniculate* L.	Oxalidaceae	Amrul
9	*Phyllanthus urinaria* L.	Euphorbiaceae	Bhuin- amla
10	*Polygonum hydropiper* (L.) Delabre	Polygonaceae	Panimorich
11	*Rumex dentatus* L.	Polygonaceae	Bon-palong
12.	*Scoparia dulcis* L.	Scrophulariaceae	Bon-dhone
13	*Blumea lacera* L.	Asteraceae	Kukshim
14	*Alternanthera philoxeroides* (Mart.)Griseb	Amaranthaceae	Sanchi
15	*Cynodon dactylon* L.	Cyperaceae	Durba
16	*Eclipta prostrata* (L.) L.	Asteraceae	Keshut
17	*Ruellia tuberosa* L.	Acanthaceae	Chatpati
18	*Enydra fluctuens Lour.*	Asteraceae	Hinche



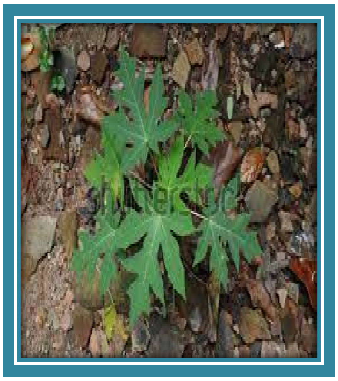
Herbs growing in the campus: (1)*Abutilon indicum*, (2) *Acalypha indica*, (3) *Aervaaspera* , (4) *Ageratum conyzoides*, (5) *Alternanthera sessilis*, (6*) Amaranthus spinosus*, (7) *Boerhaavia diffusa*, (8) *Cleome viscosa*, (9) *Coccinia grandis*, (10) *Coix lacryma-jobi*, (11*) Commelina benghalensis*, (12) *Cheilocostus speciosus*.

11.5 Medicinal Plants in the Campus:

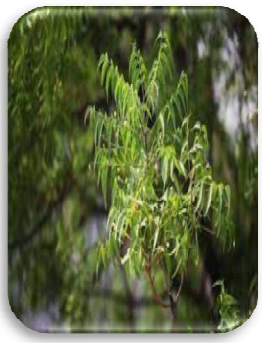
A number of plants with medicinal properties are growing in the campus, specially in the medicinal plant garden.

Sl. No.	Common Name	Scientific name	Uses
1.	Ghrita Kumari	*Aloe barbadensis Mill*	Leaves – Juice applied on head for tranquility in case of insanity. Fleshy part – in constipation, dyspepsia, menstrual complaints, eczema, diarrhea and dysentery.
2.	Basak	*Justicia adhatoda*	Couth, colds, asthma, bronchodilator
3.	Thankuni	*Cantella asiatica (Linn.) Urban*	Dysentery, Jaundice, leprosy
4.	Kulekhara	*Hygrophila schulli (Buch-ham.) M.R.et.S.M.*	Skin disease, anaemia, insomnia, rheumatism.
5.	Apang	*Achyranthes aspera Linn.*	Anti inflammatory and uterine stimulant activity, rheumatism, Hydrophobie.
6.	Kalmech	*Andrographis paniculata (Burm.f.)*	Fever, dysentery, dyspepsia, improves liver function, Leaves – in case of irregular stool, losss of appetite; roots – given to children to cure general debility.
7.	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.
8.	Chhatim	*Alstonia scholaris*	Leaves – in fever cold and cough.
9.	Amlaki	*Emblica officeinalis Gaertn*	Fruits – treat vomiting, leprosy, piles, anaemia; leaves – in ophthalmia.
10.	Kakmachi	*Solanum nigrum Linn.*	Whole plant – in asthma, bronchitis, rheumatism, hiccough, heart disease, roots – to treat urinary discase; leaves – as laxative; green fruits – paste applied on leucorrhoea; ripe fruits – to treat tuverculosis.
11.	Nayantara	*Catharanthus roseus (Linn.) G Don.*	Entire plant – to improve memory, to treat leucorrhoea, leukemia, diabetes mellitus, hypertension, intestinal works; roots – to cure septic wounds, asthma, cancer; leaves – to reduce high blood pressure, blood dysentery; latex – applied to cure cancerous wounds.
12.	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.
13.	Muktijhuri	*Acalypha indica Linn.*	Leaves – fresh juice applied to affected parts of the body in case of insect or snake-bites.
14.	Jaba	*Hibiscus rosasinensis Linn.*	Flowers – in black colour of hair, female disease; leaves – soothing, used in growth of hair, Roots – in cold.
15.	Telakucha	*Coccinia grandis (Linn.) Voigt*	Roots – in case of vomiting, burning sensation of hands and feet; Leaves – in cough and skin disease.
16.	Jhau	*Cryptomeria japonica*	Essential oil used in medicine and cosmetics.
17.	Rangan	*Lxora coccinea Linn.*	Flowers – in blood dysentery, gonorrhea; roots – in wounds of elementary canal, blood dysentery.
18.	Atibala, Potari	*Abutilon indicum*	Abutilon indicum is an Ayurvedic herb with aphrodisiac and body strengthening properties. Used in treatment of leprosy, liver disorders, ulcers, headache etc

19.	Apang	*Achyranthes aspera*	Breaks down and expels sputum collection. Useful in piles, haemorrhoids. Udaraghna. Improves blood. Shulahara. Arshohara. improves taste, relieves anorexia. useful in cardiac disorders with cholesterol deposition in blood vessels
20.	Punarnava	*Boerhavia repens L.*	Hepatoprotective activity ❖ Ca2+ channel antagonism ❖ Anti fibriyonotic activity ❖ Teratogenicity ❖ Inhibition of bone resorption ❖ Diuretic action ❖ Excellent for the heart and kidney ❖ Keeps the skin healthy ❖ Relieves oedema ❖ Balances the three doshas in the body. ❖ Relieve chest congestion ❖ Helps in preventing problems of the intestine ❖ Useful for diabetic patients ❖ Helps to prevent the breaking down of the blood clotting protein called fibrin
21.	Chakunda shak	*Cassia tora*	Cassia tora proves worthwhile in treating piles and hemorrhoids as well as relieving the pain caused on excretion., The leaves ad seeds of Cassia tora are useful in leprosy, flatulence, colic, dyspepsia, constipation, cough, bronchitis and cardiac disorders.
22.	kalkasunda	*Cassia sophera*	Osteoarthritis, Asthma, Allergic Rhinitis
23.	Kachi haldi	*Kurkuma longa, Zingiberaceae*	Liver health, Pain relief, Cancer prevention, Skin health etc.
24.	Amada	*Curcuma amada*	Pain relief, Skin health, Digestive health etc.
25.	Elaichi	*Eleteerria cardamomum*	Respiratory health, Oral health, Heart health, Digestive health etc.
26.	Banyan tree	*Ficus benghalensis*	Lower back pain, ear problem, skin issues, hair woes,
27.	kalpataru	*Ficus glomerata*	Diabetes, asthma and urinary issues
28.	Brahmi	*Bacopa monnieri*	Brahmi for hair loss, Prevents Alopecia, fair skin, treats insomnia, mental problems, treats Alzheimer's, stress reduction, memory, epilepsy treatment
29.	Arjuna	Terminalia Arjuna.	Anginal pain, hypertension, congestive heart failure







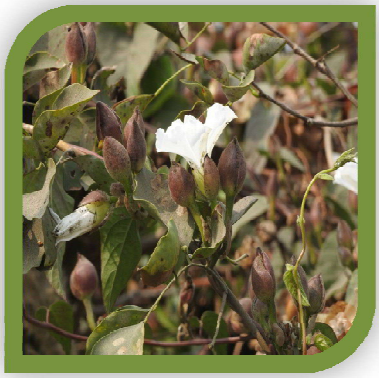



Fig. 15 : Medicinal plants in the campus area

11.6 Faunal diversity in the College Campus

Raidighi College situated in sundarban coastal region of south 24 parganas district, west Bengal. A survey was carried out to find the animal diversity in the campus of Raidighi College. The survey focused on the diversity of Arthropoda, Butterfly, Amphibian, Reptile, Birds, and mammals.

Sl. No.	**Local name Identify**	**Scientific Characteristic features / folk description**	**Indicative**	**Habitat**	**Importance**	**Present status***	**Local Distribution**
1	Kathberali	Three striped palm Squirrel *Psittacul akrameri*	Grey body with three striped.	Large canopy-treesand ground level	Pollination, seed dispersal, nutrient recycling	common	in and around Raidighi College Campus throughout village
2	Kathberali	Three striped palm Squirrel *Psittacul akrameri*	Grey body with three striped.	Large canopy-treesand ground level	Pollinatio n, seed dispersal, nutrient recycling	common	in and around Raidighi College Campus throughout village
3	Kak (House Crow)	*Corvus splendens*	Entirely black body	Very common on all habitats. Nests seen on big old trees.	visiting dead & rotten bodies as "Scavengers"	Plenty	Throughout college campus and Surrounding market areas
4	Pecha (Owl)		Grey body with white mouth	hostel building tree holes; Nests seen on old trees	Significant role inlocal pest control, for e.g., loweringthe mouse population .	seen very frequently	Raidighi college Campus; Throughout other areas
5	Cheel/Black Kite	Milvus migrans	Pale-Black body.	Large trees, roadside lamp strands	Scavenger; top predator	numerous	Through out this areas
6	Kokil/Asian Koel	Eudynamys scolopacea	Entirely Black Body.	Often seen in tree canopy during Februar y-March.	As pollinator and scavengers. Adds aesthetic value also	numerous	throughout college campus and this village araes

Sl. No.	Local name Identify	Scientific Characteristic features / folk description	Indicative	Habitat	Importance	Present status*	Local Distribution
7	Spotted Dove/ Chhite Ghughu	Sreptopelia chinensis	Greyish-brown body	Tree branches and ground	Graminivore, occasional insectivore; maintains ecosystem balance	numerous	Mostly in college campus
8	House sparrow/ Chorai	Passer domesticus	Pale brown	Almost everywh ere	Seed eaters, plays role in seed dispersal	numerous	Almost everywhere
9	Red-Vented Bulbul/Bul bul	Pycnonotus cafer	Black body with red vent	On tree branches	omnivore	numerous	Mostly inside Raidighi College, also on some road side trees.
10	Common Myna/ Salik	Acidotrheres tristris	Grey-brown body	Almost everywh ere	omnivore	numerous	Through o ut this areas
.11	Asian Pied Starling/G uye Salik	Gracupica contra	Greyish brown	On tree branches	omnivore	rare	in college campus, also on some road side trees.
12	Woodpecker	Dinopium benghalense	red, yellow, brown, golden body colour	On tree branches	Mainly insectivore , occasionally seed eater	Not much common	in college campus, also on some road side trees.
13	Moutusi/ Purple sunbird/ Durga	Cinnyris	purple coloured , metallic shine in	On shrubs	Nectarivor e, plays	common	in college campus, also
14	Tuntuni	asiaticus	males		role as pollinator		on some road side trees.
15	Magpie Robin	Copsychus saularis	Black and white body colour	On tree branches	Mostly insectivore, occasionally seed eater, plays role as pollinator	Moderatel y numerous	Through out college campus and Ward no. 26.
16	Tiktiki (House Gecko)	Hemidactylus sp	Yellow is brown body	College garden and construc tions	Pest, control of insect population		Through o ut this areas
17	Garden Lizard	Calotes versicolor	Variable colour	College campus	Seed disperser, pollinator	common	College campus and village areas

Sl. No.	Local name Identify	Scientific Characteristic features / folk description	Indicative	Habitat	Importance	Present status*	Local Distribution
18	Dhere Indur (Rat)	Rattus sp	Black or ashy black	Garbage dumps	Pest, transmission of parasites	common	Through o ut this areas
19	Kecho/ Earthworm	Lumbricus sp.	Variable morphology	Moist soil, sub surface level	Nutrient recycling	common	College campus and moist patches throughout areas
20	Cockroach	Periplaneta sp.	brown	Variable places	pest	common	College campus and moist patches throughout this areas
21	Dragonfly	Anisoptera	Variable in forms	Vegetation patches	pollinator	common	College campus and moist patches throughout this areas
22	Damsefly	Zygoptera	Variable in forms	Vegetation patches	pollinator	common	College campus and moist patches Throughout this areas
23.	Honey bees	Apis sp.	Brownish yellow	Floral units, fruit shops, organic debris	pollinator	common	College campus and moist patches throughout this areas
24	Grasshopper	Orthoptera	greenish	Grassy patches, herbs	Pollinator, nutrient recycler	common	College campus and moist patches throughout this areas

Animal Diversity (Domesticated)

Sl. No.	Name of thebreed	Indicative characteristics	Importance: advantages and disadvantages of domestication of breed	Source of the breeds	Opinions(if any) of the locals on changing pattern of domestication	Availability
1	Kukur (Dog) *Canis familiaris*	Neri/Road side sheltered	Mainly act as "scavengers", night guard for a particulararea	Desi/domest icated	Their number is increasing day by day	Plenty, throughout college campus
2	*Beral(Cat) Felis catus*	Strong flexible body; sharp teeth& Claws; usuallywhite in colour, rarely black.	Decreasing rat Population, disturbs local people by eating their foods	Stray/Feral	Their number is increasing day by day	Plenty, throughout the college campus
3	Murgi(Hen) *Gallus gallus domesti cus*	i.Poultry— Small compact light body. ii.Desi—small head with well setcomb.	These are main proteinfood for local people	i.Poultry ii.Desi	Number remained same	Available at street , every Chicken Meat Shop ; some local people are build poultry farm
4	Chhagal (Goat) *Capra aegagrus hircus*	i.Jumnapari— longears with short horns, upward curved tail, various colours— black, white and brown	These are domesticatedfor their meats and milk	i.Jumnapari ii.Nabad	Due to high price marketdemand is going to be less	Earlier DesiGoat was domesticated atevery house, but recently due to
5	Tia (Roseringe d Parrot) Psittacifor mes	Rose-ringed— green coloured body with red beak and rose-ring neck	Domesticated inside cage by very few people	Rose-ring	Number decreased	People are not interested in domestication of birds.
6	Badri (Parrot)	Yellow, blue, green with black stripes, greywhite	Domesticated At the house near College Campus.	yellow, blue, green with black stripes, grey-white	Number decreased	Breed

The college campus has a rich faunal diversity with the existence of following members:

Sl. No	**Division**	**Common Name**	**Scientific Name**	**Bengali Name**
1.	Annelida	Earthworm	*Pheretima* sp.	Kencho
2.	Arthropoda	Carpenter ant	*Camponotus* sp.	Kath pipre
3.	Arthropoda	Fire ant	*Solenopsis* sp.	Pipre
4	Arthropoda	Yellow paper wasp	*Polistes* sp.	Bolta
5	Arthropoda	Italian bee	*Apis mellifera*	Moumachhi
6	Arthropoda	Little bee	*Apis florea*	Moumachhi
7	Arthropoda	Termite	*Microtermes* sp.	Uipoka
8	Arthropoda	*Water strider*	Gerris sp.	
9	Arthropoda	Dragonfly	*Tramea limbata*	Phoring
10	Mollusca	Freshwater snail	*Bellamya bengalensis*	Gugli
11	Mollusca	Terrestrial snail	*Achatina fulica*	Sthal Shamuk
12	Mollusca	Apple snail	*Pila globosa*	Apel shamuk

11.7 Checklist of Reptiles:

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

Fig. 16 : Reptiles

11.8 Checklist of Birds:

A total of 57 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
1	Indian cormorant	*Phalacrocorax fuscicollis*
2	Little cormorant	*Microcarbo niger*
3	Little Egret	*Egretta garzetta*
4	Cattle Egret	*Bubulcus ibis*
5	Black Kite	*Milvus migrans*
6	Black shouldered kite	*Elanus axillaris*
7	Common kestrel	*Falco tinnunculus*
8	Shikra	*Accipiter badius*
9	White breasted water hen	*Amaurornis phoenicurus*
10	Pond Heron	*Ardeola grayii*
11	Common sandpiper	*Actitis hypoleucos*
12	Yellow Footed Green pigeon	*Treron phoenicoptera*
13	Rock pigeon	*Columba livia*
14	Spotted dove	*Spilopelia chinesis*
15	Ring necked dove	*Streptopelia capicola*
16	Alexandrian parakeet	*Psittacula eupatria*
17	Common Cuckoo	*Cuculus canorus*
18	Spotted Owlet	*Athene brama*
19	White throated Kingfisher	*Halcyon smyrnensis*
20	Small blue Kingfisher	*Alcedo atthis*
21	Stork billed Kingfisher	*Pelargopsis capensis*
22	Pied Kingfisher	*Ceryle rudis*
23	Common Hoopoe	*Upupa epops*
24	Chestnut headed Bee-eater	*Merops leschenaulti*
25	Green Bee-eater	*Merops orientalis*
26	Black-rumped Flameback	*Dinopium benghalense*
27	Brown-capped Pygmy Woodpecker	*Yungipicus nanus*
28	Coppersmith Barbet	*Megalaima haemacephala*
29	Blue throated Barbet	*Megalaima asiatica*

Sl. No.	Common Name	Scientific Name
30	Lineated Barbet	*Megalaima lineata*
31	Brown-capped Woodpecker	*Dendrocopos nanus*
32	Brown Shrike	*Lanius cristatus*
33	Long tailed Shrike	*Lanius schach*
34	House Sparrow	*Passer domesticus*
35	Black hooded Oriole	*Oriolus xanthornus*
36	Golden Oriole	*Orious oriolus*
37	Black Drongo	*Dicrurus macrocercus*
38	Bronze winged Drongo	*Dicrurus aeneus*
39	Common Myna	*Acridotheres tristis*
40	Asian pied Starling	*Gracupica conta*
41	Chestnut tailed Starling	*Sturnia malabarica*
42	Jungle Myna	*Acridotheres fuscus*
43	Rufous Treepie	*Dendrocitta vagabunda*
44	Common Crow	*Corvus brachyrhynchos*
45	Red vented Bulbul	*Pycnonotus cafer*
46	Red whiskered Bulbul	*Pycnonotus jocosus*
47	Common Prinia	*Prinia inornata*
48	Ashy Prinia	*Prinia socialis*
49	Common Babbler	*Turdoides caudata*
50	Brown breasted Flycatcher	*Muscicapa muttui*
51	Taiga Flycatcher	*Ficedula albicilla*
52	Tailorbird	*Orthotomus sutorius*
53	Bluethroat	*Luscinia svecica*
54	Pied Bushchat	Saxicola *caprata*
55	Oriental Magpie robin	*Copsychus saularis*
56	Pale billed Flowerpecker	*Dicaeum erythrorhynchos*
57	White Wagtail	*Motacilla alba*

Fig. 17 : Local Birds

11.9 Checklist of Mammals:

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

Fig. 18 : Mammals

11.10 Checklist of Ferns and Seasonal Flowers

Sl. No.	Local Name	Common Name	Scientific Name
1.	Fern	Fern	*Pteris spp.*
2.	Gulab	Rose	*Rosa* sp.
3.	9 o' clock plant	9 o' clock plant	*Portulaca grandiflora*
4.	Joba	Hibiscus	*Hibiscus rosa-sinensis*
5.	Marigold, Ganda	Marigold	*Tagetes erecta*
6.	Aparajita	Aparajita	*Clitoria ternatea*
7.	Maiden Pink, China pink	Maiden Pink	*Dianthus chinensis*
8.	Sandhyamani	Four o clock flower,	*Mirabilis jalapa*
9.	Nayantara	Periwinkle	*Catharanthes roseus*
10.	Shiuli	Parijat	*Nyctanthes arbor-tristis*
11.	Sthalapadma	Confederate rose	*Hibiscus mutabilis*
12.	Tagar	Tagar	*Tabernaemontana divaricata*
13.	Madhabilata	Burma creeper	*Quisqualis indica*
14.	Fishtail Fern	Fishtail Fern	Microsorum punctatum
15.	Oakleaf Fern	Oakleat Fern	Drynaria quercifolia
16.	Dog flower, Snadragon	Dog flower, Snapdragon	Antirrhinum majus
17.	Garden stock, Common stock	Garden stock, Common stock	Matthiola incana
18.	Gazania	Gazania	Gazania sp.
19.	Gladiolus	Gladiolus	Gladiolus sp.
20.	Himsagar	Flaming katy, Florist kalanchoe	Kalanchoe blossfelddiana
21.	Mike Ful	Amaryllis	Hippeastrum sp.
22.	Pansy, Garden Pansy	Pansy, Garden Pansy	Viola tricolor var.
23.	Petunia	Petunia	Petunia hybrid
24.	Verbena	Verbena	Verbena sp.

Fig. 19 : Flowering plants of the college premises

11.11 Checklist of Butterflies

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

Fig. 20 : Butterfly

CHAPTER - 12

GREEN INITIATIVES

Raidighi College aims to protect and conserve its biodiversity, fresh and clean ambiance through the following green initiatives to protect and conserve nature.

12.1 Plantation Programme

Plantation programme of Raidighi 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 the min public places as they choke drains and sewers, cause water logging and provide breeding ground for mosquitoes.

vi) Organize tree plantation programmes, awareness programmes such as Quiz, essay, painting competitions, rallys, nukkad natak etc. regarding various environmental issues and educate children about re-use of waste material & preparation of products out of waste

vii) Organize Nature Trail in Wild Life Sanctuaries/Parks/Forest are as to know about the Bio-diversity.

Fig. 21 : Plantation programme

12.2 ***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 university 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 CO_2. The tons of biomass are saved by this green computing practice

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
ix) National Pollution day
x) World Ozone Day
xi) Drive for Plastic Free Camping
xii) Awareness campaign on E-Waste Management

CHAPTER – 13

CONSOLIDATIN OF AUDIT FINDINGS

Green Audit will create a greater appreciation and under-standing of the impact of college activities on the environment. Raidighi 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. Raidighi Colleges hold adopt an Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions. White good producing companies are rapidly developing in the area of energy efficiency. Many computer hardware and electrical supply companies now cooperate with customers to reclaim old or damaged parts. Raidighi College has a tie with a Company (the entrepreneur is an alumnus of our College) which reclaims old or damaged computers and repair or replace them if possible. Although over twice as expensive up front, LCD monitors are estimated to us 40-60% less energy overall than CRTs. All computers purchased by the college have an Energy Star rating, which is beginning to be a standard requirement for computers.

13.1 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.

13.2 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 n the basis of the audit findings.

13.3 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
- Set up model rainwater harvesting system, vegetable garden, medicinal plant garden, butterfly garden etc.
- 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 & facility:

- Fire extinguishers have been placed at all strategic points. Refilling has been done before expiry of validity.
- Solid waste management system has been put in place, Solid waste are collected and put in its designated bins. Students have been advised to drop waste only in the bins earmarked for the purpose.
- Electrical installation and internal wiring are well maintained.
- Standard of housekeeping is of very high order. General cleanliners through out the college building is very very good.
- Solar Panel will be installed shortly which will reduce fossil fuel consumption.
- The college premises have proper facilities for playing Basket ball & Football, which help the students to keep physically fit.
- The college premises have a pond and some fish are cultivated there.

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 is 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) New construction or development work has to be done without cutting down any tree

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) Encouraging use of bicycles instead of motorbikes for those who come from local area (2-4 km radius).

13.2 Recommendations:

a) 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.

b) 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.

c) Establish a system of car-pooling among the staff to reduce the number of four wheelers coming to the college.

d) The Biodiversity is to be maintained while considering the plantation in future.
e) Fire safety audit is required. (in future)
f) Exhaust Gas shall be monitored, analysed and checked regularly.
g) Taps near the some room was found to non functional, should be replaced.
h) The ponds should be cleaned every year.
i) A separate enclosure needs to be made for storage of scrap and E-Waste materials.

j) 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.

k) Medicinal Garden should be keep clean.
l) Systematic plantation program should be drawn and implemented.
m) College should increase the use of Sprinklers gardening purpose
n) Medicinal garden should be improved.
o) Main meter room needs to be kept clean at all time.

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

ACKNOWLEDGEMENT

Sonar Bharat Environment & Ecology Pvt. Ltd. (SBEEPL) Green Audit Team thanks the management of Raidighi College for assigning this important work of Green Audit. We appreciate the co-operation to our team for completion of study.

Our special word thanks are extended to:

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For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Sonar Bharat Environment & Ecology Pvt. Ltd.
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Division	: 70	Current issue date	: 14.10.2022
Class	: 70.22	Current expiry date	: 13.10.2025
Process(es) not applicable	: 8.3	1st Surveillance due	: 13.10.2023
Certificate number	: IND/QMS/NAB-C3313/3200	2nd Surveillance due	: 13.10.2024
Attachment(s)	: None		

H. Narasimhaiah
Director

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THE END