

**Green Audit Report
of
KATWA COLLEGE**



2022-2023

INTERNAL QUALITY ASSURANCE CELL (IQAC)

KATWA COLLEGE

DUKBANGLOW ROAD, KATWA, PURBA BUARDHAMAN – 713 130.

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ExEcutive Summary

Rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the green campus for the institute which will lead for sustainable development. Katwa 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.

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 measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties.

Considering the present environmental problems of pollution and excessive use of natural resources, Honorable Prime Minister, Shri. Narendra Modi has declared the Mission of Swachch Bharat Abhiyan. Also, University 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, if warranted.
- 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 enhance revenue income.
- To improve process and materials efficiency, and in response to stakeholder requests for increased is closure.

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 throughout campus.
- Identification and documentation of green practices followed by university.
- 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 within 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 7 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 Footprint 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 Stakeholder.
- 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.
- Benchmarking for environmental protection initiatives.
- Financial savings through a reduction in resource use.
- Development of ownership, personal and social responsibility for the University 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 University.
- Finally, it will help to build a positive impression through green initiatives for the upcoming NAAC visit.

1.7 Introduction of Auditing Firm

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

Details of team Member

Sr. No.	Name	Designation/ Technical	Technical Experience /Qualification
1	Shri Parimal Sarkar	Legal Expert	<ul style="list-style-type: none">➤ M.Sc. in Disaster Management➤ Post Graduate Diploma in Environmental Law from National Law School, Bangalore➤ Lead Auditor in ISO 14000 (Environmental Management)
2	Shri Subrata De Sarkar	General Manager	<ul style="list-style-type: none">➤ General Manager in Central Public Sector undertaking.➤ 12 years experience in Environmental Auditing➤ Lead Auditor in ISO 50001:2011
3	Shri Suman Chchattaraj	Environmental Specialist	<ul style="list-style-type: none">➤ M.Tech in Environmental Science➤ 20 years experience in Environmental Impact Studies and Auditing

Energy Audit Team

S N	Name	Designation/ Qualification	Experience
1	Shri Suvra Majumdar	<ul style="list-style-type: none">➤ Post Graduate Diploma in Energy Management (MBA)➤ B.Tech (Electrical Engineering)	<ul style="list-style-type: none">➤ 15 years experience of Energy audit
2	Shri Gautam Ghosh	<ul style="list-style-type: none">➤ Diploma in Mechanical & Electrical Engineering from Calcutta Technical School	<ul style="list-style-type: none">➤ 27 Years experience of working in electrical engineering department in different industries.➤ 12 years experience in independent electrical auditing

1.8 List of Instruments

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	Kusam Mecco/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 Department

Sl. No.	Name of Equipment	Make	Model
1	Field Dust Sampler	Envirotech/Lata Envirotech	APM – 550, PM 2.5 & 10
2	Respirable Dust Sampler	Envirotech/Lata Envirotech	APM-460BL
3	Stack Kit Sampler	Envirotech/Lata Envirotech	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 Whather 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

KATWA COLLEGE

2.1 Introduction

The College accommodates thousands of first generation learners from the economically backward section of the rural/semi-rural population. The College tries to attract students from the minority community as far as possible. The College endeavors to inculcate communal harmony among the learners. The College achieved the status of an undergraduate College in 1959. The main campus comprises the Main Building, Science Building, B.Ed Building, Boys' Common Room, Girls' Common Room, Canteen, Administrative Building and a Post office. The second campus holds the Girls' Hostel, Principal's Quarter and Teaching Staff quarters. On the third campus stands the Boys' Hostel. The Sports Ground of the College forms the fourth campus of the College.

At the outset, the College was affiliated to Calcutta University until Burdwan University was established on 16th June 1960. The College was included into 2(f) and 12(b) categories under UGS Act. 1956 in the year 1959. The College enjoys Grant-in-Aid financial status under the Government of West Bengal.

The College sporadically suffered from an acute staff shortage, both of teaching and non-teaching staff. The College has tried to address the crisis by employing Govt. Approved Part-timers and Contractual lecturers and also by recruiting temporary teachers and when required.

2.2 History of College

During World war II, the apprehension of bombardment of Kolkata endangered exodus of people from the city Kolkata on an alarming scale as a result, the authorities of the big non Government Colleges in Kolkata in a 'dispersal' scheme proposed off-shoots of those colleges in different parts of West Bengal, miles away from the capital of which Katwa was one. True to tell, the people of Katwa then squarely refused to accept the proposal of an off shoot college at Katwa but the truth was that the govt. policy of dispersal scheme itself was enough to enthuse their minds an acclaimed social leader. Late Jitendra Nath Maitra was the pioneer, and he was later joined by many distinguished personalities of the locality, notable among them were Prof. P.N. Mukherjee, Prof. S. N. Banerjee, Dr. P. N. Bandyopadhyaya, Prof. S.P. Mukherjee, Dr. Haramohan Sinha and the renowned Bengali poets like Kalidas Roy and Kumud Ranjan Mallick who threw their weight behind the establishment of a college at Katwa. Their sincere and indefatigable efforts took on a tangible form with the inauguration of the college on 16th August. 1948.

To begin with the college was started as an intermediate college housed in Surya Narayan Memorial Hall of K D Institution with around 140-150 students. As a unique example of co-operation towards the growth of higher educational institution, the people of this locality then donated not less than Rs. 32,000/- (Thirty two thousand) the present currency valuation being at least ten times. Not only that the then Managing Committee of KDI donated to the college authorities a concrete building of four rooms and a portion of the school land which a part of the existing main building of the college was erected thereafter the college authorities made no mistake to take up the right measures at the right moment with the result that in 1959 the college achieved the status of a full fledged undergraduate college along with its affiliation to the UGC as well as sanction of a building grant Rs. 1,95,000/- there from. Withstanding the wear and tear of time and two devastating floods, the College now stands with towering glory to fulfill the mission and the vision of the organizers.

The College was initially affiliated to Calcutta University until Burdwan University was established on 16th June 1960. Its inclusion into 2(f) and 12(B) categories under UGC act 1956 took place in 1959 it now enjoys grant in aid financial status under govt. of West Bengal besides the achievements of the statutory status the college has been untiringly and sincerely carrying on its mission and maintaining a steady pace of

progress in precept of advancement of learning the college by this time has increased its faculty strength to 58 full time teachers and 30 part time teachers the college sprawling over 10 acres of land consists of four adjunct campus the campus the campus comprises the main building, Science building, Administrative building, Canteen; two common rooms (Boys and Girls) Guest room, Laboratories, Garden, Post office, Bank and an Auditorium under construction. The main building houses the central library and the library for the morning section which altogether stocks more than 40 thousands books and journals. The second campus has housed the staff quarters, Principle's residence and the two girls' hostels, the third campus accommodating the boys hostel and the Superintendents quarter. The fourth campus which is approximately 300 mt away from the main campus, encloses a playground. With the capacity of its enrollment of 3960 the college now deserves to be considered as the second biggest affiliated college under Burdwan University. This shows that from the very humble beginning, the college has progressive evolved into a big undergraduate college, offering co-education and three year under-graduate honours and general courses in Humanities Sciences and Commerce as well as one-year B.Ed courses.

2.3 Institutional Strength, and Weakness

Institutional Strength

- The College has a vast landed area.
- Uninterrupted supply of safe drinking water, power and internet/wi-fi is available in the campus.
- The College has low-cost hostel facilities for both boys and girls.
- The College hosts a Post Office which serves the local community
- The College has multi-gym funded by the State Government.
- The institution has its own staff quarters for its faculties.
- The Institution is well connected by road and railways.
- The NSS and NCC units carry out rural extension work on a regular basis.
- The College has its own playground.
- The Institution has a medicinal plant garden.
- The College offers Science subjects (both Honors & General courses) to the students.
- The College also runs a Govt. aided B.Ed. department.
- The College has an exclusive Morning section for girls.
- The College publishes a peer reviewed double blinded international research journal named *International Journal of Research on Social and Natural Sciences* and multilingual academic journal called String twice a year.
- The College motivates its teachers to take up research and MRPs and act as co-guides supervising doctoral works.
- There is a cordial relationship and good integrity among the stakeholders of the the Institution.

Institutional Weakness

- The College suffers from a shortage of classrooms.
- The number of toilets for the learners is limited.
- The Library has an acute space shortage.
- There is shortage of space in the Laboratories with the number of students increasing every year.
- The College suffers from an adverse teacher-student ratio; however vacant posts are now getting filled up.
- The College is run by a skeletal structure of non-teaching staff.
- There is no computer laboratory for the students.
- The learners are weak in communicative English. Nevertheless, the College is about to make a contract with an institute which will train students in spoken English.
- Result in the general section is not up to the mark since most students are first generation learners and come from a very weak economic background.
- Non-settlement of building grant received under X-th plan for construction of a new Ladies Hostel.
- There is no full-time Facility in the General section of the Morning Shift.
- There is no provision for proper chemical waste disposal inside the Campus.
- There is no provision for proper e-waste disposal.

2.4 Vision of the College:

- The vision of the College gradually changed with time, especially with spreading literacy mission all over West Bengal. The College tries to attract students from the minority community as far as possible. This is more important in the case of girls from the minority, who are admitted to the Morning section of the College which exclusively serves girls. The College endeavours to inculcate communal harmony among the learners by convening Saraswati puja as well as observing Navi Diwas.
- The College adopts an inclusive approach through expanding the scope of education to farther areas beyond the immediate rural belt surrounding the townships. Thus the College ventured to accommodate students from as many as the four districts, to acknowledge the collective aspiration of the prospective students from this rural belt for social identity. Simultaneously the College allows special assistance to the SC/ST and minority students. The rise in the numbers of the first generation learners became a salient feature in the rural belt mentioned earlier. This resulted in continual rise in the intake of students in the College. The College was doing its best to cater higher education to this increasing mass of aspiring students.

2.5 Mission of the College:

The mission of College is 'Advancement of Learning' – the method followed to achieve the supreme good for one self. Here in this college, the goal is to serve the students, mostly as they are, coming from economically, socially, and educationally constrained circumstances by providing them quality education by:

- i) Exposing young minds to advanced scientific topics and imparting hands-on training with sophisticated analytical instruments.
- ii) To establish in the college as a potential centre of reaserch activities thus creating a strong tradition of deep-rooted academic culture and an ambience that favours the scholarly activities of the faculty.
- iii) Imparting a character-building education by a balanced development of the body (physical) and soul (spiritual) so that the students may turn out to be wise citizens able to shoulder the responsibility of the Nation.
- iv) Developing a culture of labour and service, focus and perseverance, simple living and high thinking is transmitted to the students who are the future of the nation.

Location of the College

The College is situated at Dukbanglow Road, katwa Town, in the district of East Burdwan.

Communication and Transportation

The College is well connected by bus and train. The College is located 1.5 km. from Katwa railway station and bus stand is 2 km from the college. Distance from Katwa College to netaji Subhas Ch. Bose Airport is around 145.8 Kms.

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, KATWA COLLEGE, WEST BENGAL

4.1 General overview of the concept of landuse:

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

4.2 Methodology adopted for land use mapping

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

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 Katwa College with a view to detect the land consumption in the built-up land area.

LAND USE DATA OF COLLEGE OF KATWA COLLEGE

CATEGORIES OF LAND USE	AREA IN SQ METRES
OPEN SPACE AND PLANTATION	4771.21
Ground Coverage	3290.03
TOTAL AREA	8061.24

Ground coverage of 40.82% (i.e 3290.03 sq metres) consists of the buildings.

FINDINGS:

Katwa College, which was established in the year 1948, 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 59.18% 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

Water quality analysis was conducted by Qualissure Laboratory Services

5.1 Water Quality Analysis Test Report

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

Name & Address Of the Customer : M/s. Katwa College Dukbanglow Road, Katwa, Purba Bardhaman – 713 130.	Report No. : QLS/W/23-24/C/411 Date : 07.08.2023 Sample No. : QLS/MR/23-24/411 Sample Description : Drinking Water Sample Mark : Office Aqua guard Date of Performance : 28.07.2023-06.08.2023 Sample Drawn On : 26.07.2023
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Analysis Result

(A) Microbiological Analysis

Sl. No.	Characteristic	Limit as per Drinking Water Standard : IS:10500, 2012Amd. 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	7.64
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	346
4.	Calcium(as Ca) in mg/l	IS 3025 (Part 40)- 1991 (RA: 2019)	75	200	57.4
5.	Chloride(as Cl) in mg/l	IS 3025 (Part 32)- 1988 (RA: 2019)	250	1000	60.3
6.	Iron (as Fe) in mg/l	IS 3025(Part 53)-1988 (RA: 2019)	1.0	No Relaxation	0.21
7.	Magnesium(as Mg) in mg/l	APHA 24 th Edition – 2023, 3500 Mg	30	100	29.8
8.	Nitrate (as NO ₃) in mg/l	IS 3025 (Part 34)-1988 (RA: 2019)	45	No Relaxation	<0.5
9.	Free Residual Chlorine in mg/l	IS 3025 (Part 26): 1986(RA 2021)	0.2	1.0	<0.1
10.	Sulphate (as SO ₄) in mg/l	IS 3025 (Part 24)-1986, (RA: 2022)	200	400	32.6
11.	Alkalinity (as CaCO ₃) in mg/l	IS 3025 (Part 23)- 1986, (RA: 2019)	200	600	274.4
12.	Total Arsenic(as As) in mg/l	IS 3025 (Part 37):1988,(RA 2019)	0.01	No Relaxation	<0.01
13.	Total Hardness (as CaCO ₃) in mg/l	IS 3025 (Part 21): 2019	200	600	267.7



Fig. 1 : Drinking water sample collect

Drinking water facility at Katwa College

Total requirement of water is drawn from the bore well installed in the campus.

Water is used for drinking, canteen, toilets, laboratories, lavatories, gardening, cleaning and maintenance. The college campus has several water outlets. During the survey, no loss of water was observed, neither by leakages, or by over flow of water from overhead tanks. The data collected from the concerned departments was examined and verified. On an average the total use of water in the college in normal working day is 36,000 L/day, which include 20,000 L/day for non academic purposes, 10,000 L/day for gardening and 6,000 L/day for different laboratories.

CHAPTER – 6

AMBIENT AIR QUALITY AssEssMENT ANd MANAqEMENT

6.1 Air Quality Test Report

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

TEST REPORT

Name & Address Of the Customer : M/s. Katwa College Dukbanglow Road, Katwa, Purba Bardhaman – 713 130.	Report No.	: QLS/MR/A/23-24/C/712
	Date	: 02.08.2023
	Sample No.	: QLS/MR/A//23-24/712
	Sample Description	: Ambient Air
	Sample Mark	: Near Main Gate

Analysis Result

Location: Near Main Gate		Date of sampling : 26.07.2023-27.07.2023		
Sampling Done by: B. Mondal		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition: Partly Cloudy & Rainfall		Average Temperature : 29°C		
Barometric Pressure : 756 mm of Hg		Average Humidity : 63%		
Sl. No.	Pollutants	Result	Limit as per CPCB	Method of Test Reference
1	Particulate matter (<10µm) in µg/m ³	69	100	IS: 5182 (Part-23), RA-2017
2	Particulate matter (<2.5µm) in µg/m ³	31	60	USEPA CFR-40,Part-50, Appendix-L
3	Sulphur dioxide (SO ₂) in µg/m ³	6.1	80	IS: 5182 (Part-2)-2001, RA-2017
4	Nitrogen dioxide (NO ₂) in µg/m ³	25.6	80	IS: 5182 (Part- 6)-2006, RA-2017
5	Carbon monoxide (CO) in µg/m ³	698	2000	IS: 5182 (Part- 10):1999, RA-2014
NOTE: Limit as per CPCB notification, New Delhi, 18 th November 2009, for Ambient air quality.				



Fig. 2 : Ambient Air sample collect

AMBIENT AIR TEST REPORT

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

TEST REPORT

Name & Address Of the Customer : M/s. Katwa College Dukbanglow Road, Katwa, Purba Bardhaman – 713 130.	Report No.	: QLS/MR/A/23-24/C/713
	Date	:02.08.2023
	Sample No.	: QLS/MR/A/23-24/713
	Sample Description	: Ambient Air
	Sample Mark	: Near Staff Room

Analysis Result

Location: Near Staff room Gate		Date of sampling : 26.07.2023-27.07.2023		
Sampling Done by: B. Mondal		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition: Partly Cloudy & Rainfall		Average Temperature : 29°C		
Barometric Pressure : 756 mm of Hg		Average Humidity : 63%		
Sl. No.	Pollutants	Result	Limit as per CPCB	Method of Test Reference
1	Particulate matter (<10µm) in µg/m ³	56	100	IS: 5182 (Part-23), RA-2017
2	Particulate matter (<2.5µm) in µg/m ³	24	60	USEPA CFR-40,Part-50, Appendix-L
3	Sulphur dioxide (SO ₂) in µg/m ³	5.3	80	IS: 5182 (Part-2)-2001, RA-2017
4	Nitrogen dioxide (NO ₂) in µg/m ³	26.3	80	IS: 5182 (Part- 6)-2006, RA-2017
5	Carbon monoxide (CO) in µg/m ³	606	2000	IS: 5182 (Part- 10):1999, RA-2014
NOTE: Limit as per CPCB notification, New Delhi, 18 th November 2009, for Ambient air quality.				



Fig. 3 : Ambient Air sample collect

CHAPTER – 7

NOISE MONITORING

7.1 Ambient Noise Monitoring Status:

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

TEST REPORT

Name & Address Of the Customer : M/s. Katwa College Dukbanglow Road, Katwa, Purba Bardhaman – 713 130.	Report No. : QLS/MR/A/23-24/C/714 Date : 02.08.2023 Sample No. : QLS/MR/A/23-24/714 Sample Description : Ambient Noise Date of Performance : 28.07.2023-02.08.2023
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Sampling Done By: B. Mondal				
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
714	26.07-27.07.2023	Near Main Gate	61.3	49.8

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



Fig. 4 : Noise level monitoring

HAPTER - 8

Rain water HaRvesting system

The College has taking steps for Rain Water Harvesting system, it will be complete within 6 months.

CHAPTER - 9

ELECTRICITY CONSUMPTION (IN UNIT) AND MANAGEMENT

9.1 General Details:

Sl.No.	PARTICULARS	DETAILS	
1	Name & Address of College	Katwa College Dukbanglow Road, Katwa, Purba Bardhaman –713 130	
	Web Site	https://surividyasagarcollege.org.in	
2	Name of Contact Officer	Dr. Nirmalendu Sarkar	
	Designation	Principal	
	Name of Alternative Officer	Shri. Utpal Das	
	Designation	Associate Professor, IQAC-CO-ordinator	
3	Telephone No.	NA	
	Mobile No.	7001722941	
	Fax No.		
	e-mail ID	katcoll2009@gmail.com	
	No. of shift	7AM. TO 5 PM	
	No. of Employees (Approx)	88	
4	Electricity Consumption	Imported (Purchased) 1388	
5	Specific Energy Consumption	Fuel	Electricity
		26901.16	Rs. 12,303/- (Per month)
6	LPD	4,400/-	
7	EPI	6.08	

9.2 Electrical Details

a) Transformers

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

b) Electricity Consumption

	Particulars	Demand
A	Contract demand KVA	86.14
B	Maximum demand	86.14
C	Total Energy units consumed / year	16657
D	Avg. Power Factor(P.F.)	0.97
E	Avg. Energy bills(Rs/year)	Rs.1,47,642/-

c) Detailed list of Electric Motors operating in the college

S.NO.	NAME OF THE PLANT	RATING OF MOTOR (KW)	NO. OF MOTORS
1	Katwa College, Dukbanglow Road, Katwa, Purba Bardhaman – 713 130.	9.68 KW	5 nos.

d) **Connected Load**

	EQUIPMENT	TOTAL NUMBERS	LOAD IN KW (TOTAL)
A	Motors : Greater than 10kW	NIL	NIL
	: Less than 10 kW	5Nos.	9.68 KW
B	AC & Ventilation with TR capacity		
a)	Others (Package ACs/ Split ACs / Windows ACs) & Generator	Room AC of Split/Window type – 90.00 KW	
C	Total Process Load (in kW)	99.68 KW	
D	Total Lighting Load, Computer, Printer & Luminaries (KW) etc.	No's of lighting luminaries (LED+T/L+ (including fan) Tube Light, Led Light, etc.= 73.86 KW Electric Fan - 45.59 KW	
	Total Load (in kW)	219.13 KW	

A. Lux Measurements :

Sl.no.	Room	LUX level	Remarks
1.	Main Building		
	Ground Floor	301,299,304,296,299	
	1 st floor	298,302,304,302,300	
	2 nd floor	299,306,300,307,297	
2	Admin. Building		
	Ground Floor	302,301,305,298,304	
	1 st floor	296,302,304,300,308	
	2 nd floor	304,302,290,298,306	
3	Girls Hostel (New)		
	Ground Floor	298,294,302,306,301	
	1 st floor	306,301,300,296,303	
	2 nd floor	303,304,299,307,309	
	3 rd floor	295,303,304,300,304	
4	Boys Hostel		
	Ground Floor	306,300,302,302,299	
	1 st floor	303,304,300,299,306	
	2 nd floor	300,307,303,304,298	
5	Bio-Science Building		
	Ground Floor	301,304,303,308,299	
	1 st floor	302,300,294,296,303	
	2 nd floor	299,303,301,306,305	
6	Old Office Building		
	Ground Floor	297,301,306,301,302	
	1 st floor	300,296,304,308,299	
	2 nd floor	288,298,303,304,299	
7	B.Ed Building		
	Ground Floor	307,296,303,305,300	
	1 st floor	304,302,304,306,308	
	2 nd floor	299,301,304,309,300	

Illumination Level Comparison

Area	Average Lighting Level (LUX)	NBC Recommended
Main Building	301	300-500
Admin. Building	301	300
Girls Hostel (New)	302	300
Boys Hostel	302	300
Bio-Science Building	302	300
Old Office Building	300	300
B.Ed Building	303	300

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

The Institute has taken an important step to use solar system, so as to save some electricity. This job will be started very soon.

CHAPTER - 10

Waste Management

The present 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

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



Fig. 5 : Solid Waste

10.2 Liquid Waste

The source of wastewater is Domestic Waste Water i.e., Sewage water. The liquid waste primarily from the department of Chemistry goes to a soak pit set up inside the campus which is connected to the Municipality sewerage system

10.3 E-Waste

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

All members particularly students have been advised not to throw used pendrive etc. any where, but to keep in designated bins.

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

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

It is hope that the institution will take steps to do this very soon.



Fig. 6 : Solid Waste

CHAPTER - 11

Biodiversity status of the College Campus

11.1 Introduction

Katwa 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.

Survey Area

The green area of Katwa College covers approximately 0.49 acres out of 1.99 acres, which is about 25 percent of the total area, and is strategically distributed across different sections of the campus. The green spaces include gardens, courtyards, an open field, and a play ground, providing ample opportunities for relaxation, outdoor activities, and study in a natural setting.

Location Map



Fig. 7 : Location map

11.3 Method of Study

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

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

- i) Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were searched near pond, road beside wetland and in other possible areas. Diurnal search operations are also successful.
- j) Active invertebrates like the insects require more active search. For larger winged insects like butterflies, dragonflies and damselflies, random samplings were carried and point sampling was also done.
- k) The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or microhabitat. Searching was carried out under stones, logs, bark, in crevices in the walls and rocks and also in leaf litter, dung etc. 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

There are approximately 170 plants in the main campus of which 56 plants(approx.) are canopy trees, 28(Approx.)are plants of average length and 86(approx.) are small plants. There are 25 medicinal plants in the college Botanical Garden. These plants contribute to the Oxygen supply. The college observes Environment Day every year by planting new saplings.

These plants are listed and depicted as following:

List of the Major Plants of the Garden

কৃষ্ণচূড়া <i>Delonix regia</i> (Bojer ex Hook.) Raf. Family: Fabaceae; Clade: Rosids	বান্দরলাঠি <i>Cassia fistula</i> L. Family: Fabaceae; Clade: Rosids	মিনজিরি <i>Senna siamea</i> (Lam.) H.S.Irwin&Barneby Family: Fabaceae; Clade: Rosids
মেহগনি <i>Swietenia mahagoni</i> (L) Jacq. Family: Meliaceae; Clade: Rosids	কনকচূড়া <i>Peltophorumpterocarpum</i> (DC.) Backer ex K.Heyne Family: Fabaceae; Clade: Rosids	বকুল <i>Mimusopselengi</i> L. Family: Sapotaceae; Clade: Asterids
শিশু <i>Dalbergia sissoo</i> Roxb. ex DC. Family: Fabaceae; Clade: Rosids	শিরিষ <i>Albizia lebbek</i> (L.) Benth. Family: Fabaceae; Clade: Rosids	দেবদারু <i>Monoonlongifolium</i> (Sonn.) B. Xue & R.M.K. Saunders Family: Annonaceae; Clade: Magnoliids
ঝাউ <i>Casuarina equisetifolia</i> L. Family: Casuarinaceae; Clade: Rosids	ছাতিম <i>Alstoniascholaris</i> (L.) R.Br. Family: Apocynaceae; Clade: Asterids	নিম <i>Azadirachta indica</i> A. Juss. Family: Meliaceae; Clade: Rosids
ইউক্যালিপটাস <i>Eucalyptus tereticornis</i> Sm. Family: Myrtaceae; Clade: Rosids	সেগুন <i>Tectona grandis</i> L.f. Family: Lamiaceae; Clade: Asterids	বট <i>Ficus benghalensis</i> L. Family: Moraceae; Clade: Rosids
পাকুড় <i>Ficus virens</i> Aiton Family: Moraceae; Clade: Rosids	আম <i>Mangifera indica</i> L. Family: Anacardiaceae; Clade: Rosids	তাল <i>Borassus flabellifer</i> L. Family: Areaceae; Clade: Commelinids
শারোগো <i>Gliricidiasepium</i> (Jacq.) Kunth Family: Fabaceae; Clade: Rosids	চন্দ্রপ্রভা <i>Tecoma stans</i> (L.) Juss. ex Kunth Family: Bignoniaceae; Clade: Asterids	নাগলিঙ্গম <i>Couroupitaguianensis</i> Aubl. Family: Lecythidaceae; Clade: Asterids
বেল <i>Aegle marmelos</i> (L.) Correa Family: Rutaceae; Clade: Rosids	কাঠ-বাদাম <i>Terminalia catappa</i> L. Family: Combretaceae; Clade: Rosids	Ach <i>Morindacoreia</i> Buch.-Ham. Family: Rubiaceae; Clade: Asterids
Kurchi <i>Holarrhenapubescens</i> Wall. ex G.Don Family: Apocynaceae; Clade: Asterids		

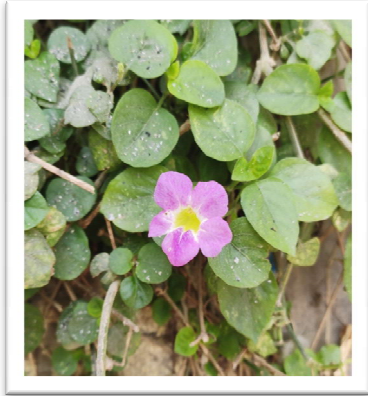


Fig. 8 : Major plant in the campus area

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	Basak	Justicia adhatoda	Cough, colds, asthma, bronchodilator
2	Apang	Achyranthes aspera Linn.	Anti inflammatory and uterine stimulant activity, rheumatism, Hydrophobie.
3	Kalmech	Andrographis paniculata (Burm.f.)	Fever, dysentery, dyspepsia, improves liver function, Leaves – in case of irregular stool, loss of appetite; roots – given to children to cure general debility.
4	Harjora	Cissus quadrangularis Linn. Syn. Vitis quadrangularis	Leaves – in bowel complaints; stem to cure scurvy, irregular menstruation, asthma, sap applied externally on forehead to cure one-sided headache.
5	Amlaki	Emblca officinalis Gaertn	Fruits – treat vomiting, leprosy, piles, anaemia; leaves – in ophthalmia.
6	Ramtulsi	Ocimum gratissimum Linn.	Leaves – Decoction of the leaf applied to treat septic wounds, Seeds – soaked in water and taken very cooling and refreshing drink.
7			
8	Jaba	Hibiscus rosasinensis Linn.	Flowers – in black colour of hair, female disease; leaves – soothing, used in growth of hair, Roots – in cold.
9	Telakucha	Coccinia grandis (Linn.) Voigt	Roots – in case of vomiting, burning sensation of hands and feet; Leaves – in cough and skin disease.
10	Arshagandha	Wythanasomnifera	Root, Leaf, Fruits and Seed
11	Akanda	Calotropisagigantea	Bark, Root, Leaf, Latex, Flower
12	Ayapan	Eupatorium triplinerve	Whole Plants
13	Tulsi	Ocimum sanctum	Leaf
14	Kari pata	Murrayakoenigii	Root, Leaf, Fruit
15	Bisallakarani	Barlerialupulina	Leaf
16	Kulephara	Hygrophilaschulli	Whole plant
17	Gurmar	Gymnemasylvestre	Root, Leaf, Fruit
18	Grikumari	Aloe vera	Leaf
19	Thankuni	Cantellaasiatica	Leaf
20	Nayantara	Catharanthusroseus	Whole Plants
21	Neem	Azadirachtaindica	Bark, Leaf, Young Stem, Unrippedfruit, Seed Oil
22	Basak	Adhatodavasika	Leaf, Flower, Bark, Root
23	Bisllakarani	Gendarussa Vulgaris	Leaf
24	Bel	Aeglemarmelos	Root, Young Leaf, Flower, Ripe and Unripped Fruit
25	Sarpagan Jha	Raunolfiaserpentina	Leaf
26	Sughni	Marsileaminuta	Whole Plant
27	Karabi	Neriumodorum	Root, Leaf, Bark, Stem
28	Black Tulsi	Ocimumtenuiflorum	Whole Plant, Leaf, Seed
29	Muthagrass	Cyperusrotundus	Root



1. *Asystasia gangetica*



2. *Hygrophila spinosa*



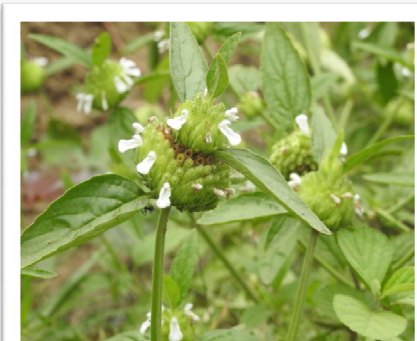
3. *Anisomeles indica*



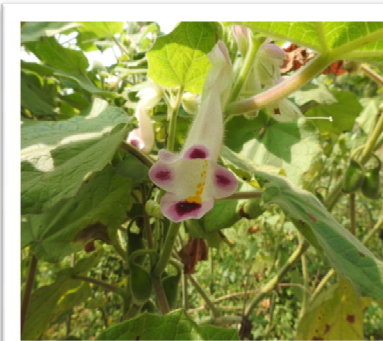
4. *Hyptis suaveolens*



5. *Leonotis nepetifolia*



6. *Leucas cephalotes*



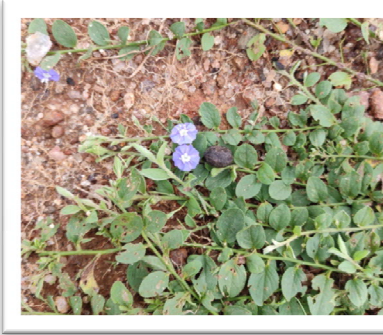
7. *Martynia annua*



8. *Vitex negundo*



9. *Clerodendrum viscosum*



10. *Evolvulus alsinoides*



11. *Ipomoea pes-tigridis*



12. *Operculina turpethum*



13. *Euphorbia tirucalli*



14. *Ricinus communis*

Fig. 9 : Medicinal plant

11.6 Checklist of Reptiles:

Sl. No.	Common name	Scientific Name	Bengali Name
1	Checkered Keelback	<i>Xenochrophis piscator</i>	Joldhora
2	Buff Striped Keelback	<i>Amphiesma stolatum</i>	Hele
3	Rat Snake	<i>Zamenis longissimus</i>	Darash
4	Skink	<i>Lampropholis sp.</i>	Anjani
5	Oriental Garden Lizard	<i>Colotes versicolor</i>	Girgiti
6	Common House Gecko/Gekko	<i>Hemidactylus frenotus</i>	Tiktiki

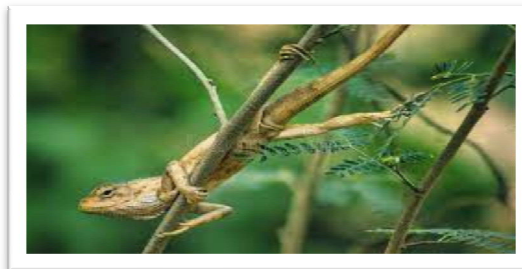
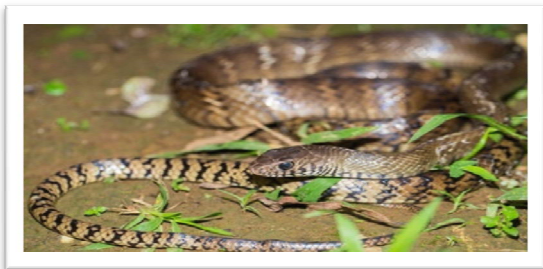
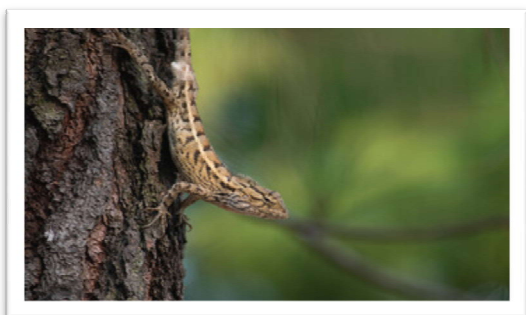


Fig. 10 : Reptiles

11.7 Checklist of Birds:

A total of 59 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	<i>Phalacrocorax fuscicollis</i>
2	Little cormorant	<i>Microcarbo niger</i>
3	Little Egret	<i>Egretta garzetta</i>
4	Cattle Egret	<i>Bubulcus ibis</i>
5	Black Kite	<i>Milvus migrans</i>
6	Black shouldered kite	<i>Elanus axillaris</i>
7	Common kestrel	<i>Falco tinnunculus</i>
8	Shikra	<i>Accipiter badius</i>
9	White breasted water hen	<i>Amaurornis phoenicurus</i>
10	Pond Heron	<i>Ardeola grayii</i>
11	Common sandpiper	<i>Actitis hypoleucos</i>
12	Yellow Footed Green pigeon	<i>Treron phoenicoptera</i>
13	Rock pigeon	<i>Columba livia</i>
14	Spotted dove	<i>Spilopelia chinesis</i>
15	Ring necked dove	<i>Streptopelia capicola</i>
16	Alexandrian parakeet	<i>Psittacula eupatria</i>
17	Common Cuckoo	<i>Cuculus canorus</i>
18	Spotted Owlet	<i>Athene brama</i>
19	Common Hoopoe	<i>Upupa epops</i>
20	Chestnut headed Bee-eater	<i>Merops leschenaulti</i>
21	Green Bee-eater	<i>Merops orientalis</i>
22	Black-rumped Flameback	<i>Dinopium benghalense</i>
23	Brown-capped Pygmy Woodpecker	<i>Yungipicus nanus</i>
24	Coppersmith Barbet	<i>Megalaima haemacephala</i>
25	Blue throated Barbet	<i>Megalaima asiatica</i>
26	Lineated Barbet	<i>Megalaima lineata</i>
27	Brown-capped Woodpecker	<i>Dendrocopos nanus</i>
28	Brown Shrike	<i>Lanius cristatus</i>
29	Long tailed Shrike	<i>Lanius schach</i>

Sl. No.	Common Name	Scientific Name
30	House Sparrow	<i>Passer domesticus</i>
31	Black hooded Oriole	<i>Oriolus xanthornus</i>
32	Golden Oriole	<i>Oriolus oriolus</i>
33	Black Drongo	<i>Dicrurus macrocercus</i>
34	Bronze winged Drongo	<i>Dicrurus aeneus</i>
35	Common Myna	<i>Acridotheres tristis</i>
36	Asian pied Starling	<i>Gracupica conta</i>
37	Chestnut tailed Starling	<i>Sturnia malabarica</i>
38	Jungle Myna	<i>Acridotheres fuscus</i>
39	Rufous Treepie	<i>Dendrocitta vagabunda</i>
40	Common Crow	<i>Corvus brachyrhynchos</i>
41	Red vented Bulbul	<i>Pycnonotus cafer</i>
42	Red whiskered Bulbul	<i>Pycnonotus jocosus</i>
43	Common Prinia	<i>Prinia inornata</i>
44	Ashy Prinia	<i>Prinia socialis</i>
45	Common Babbler	<i>Turdoides caudata</i>
46	Brown breasted Flycatcher	<i>Muscicapa muttui</i>
47	Taiga Flycatcher	<i>Ficedula albicilla</i>
48	Tailorbird	<i>Orthotomus sutorius</i>
49	Bluethroat	<i>Luscinia svecica</i>
50	Pied Bushchat	<i>Saxicola caprata</i>
51	Oriental Magpie robin	<i>Copsychus saularis</i>
52	Pale billed Flowerpecker	<i>Dicaeum erythrorhynchos</i>
53	White Wagtail	<i>Motacilla alba</i>
54	Pied Wagtail	<i>Motacilla alba</i>
55	Yellow Wagtail	<i>Motacilla flava</i>
56	Citrine Wagtail	<i>Motacilla citreola</i>
57	Purple rumped Sunbird	<i>Leptocoma zeylonica</i>
58	Silver billed Munia	<i>Lonchura punctulata</i>
59	White throated Fantail	<i>Rhipidura albicollis.</i>



Fig. 11 : Local Birds

11.8 Checklist of mammals:

Sl. No.	Common name	Scientific name	Bengali name
1	Indian palm squirrel	<i>Funumbulus sp.</i>	Kathberali
2	Frugivorous bat	<i>Suborder Megachiroptera</i>	Badur
3	Insectivorous bat	<i>Suborder Microchiroptera</i>	Chamchike
4	House mouse	<i>Mus musculus</i>	Indur
5	Rat	<i>Rattus norvegicus</i>	Dhere indur
6	Cat	<i>Felis Catus</i>	Biral
7	Dog	<i>Canis lupus familiaris</i>	Kukur
8	Rabbit	<i>Oryctolagus cuniculus</i>	khargosh

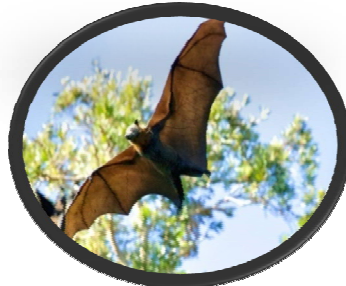


Fig. 12 : Mammals

11.09 Checklist of Ferns and Seasonal Flowers

Sl. No.	Local Name	Common Name	Scientific Name
1.	Bird-nest-Fern	Bird-nest Fern	Asplenium sp.
2.	Fern sp.		
3.	Fishtail Fern	Fishtail Fern	Microsorium punctatum
4.	Oakleaf Fern	Oakleat Fern	Drynaria quercifolia
5.	Dog flower, Snadragon	Dog flower, Snapdragon	Antirrhinum majus
6.	Garden stock, Common stock	Garden stock, Common stock	Matthiola incana
7.	Gazania	Gazania	Gazania sp.
8.	Gladiolus	Gladiolus	Gladiolus sp.
9.	Himsagar	Flaming katy, Florist kalanchoe	Kalanchoe blossfeldiana
10.	Maiden Pink	Maiden Pink	Dianthus deltoids
11.	Mike Ful	Amaryllis	Hippeastrum sp.
12.	Pansy, Garden Pansy	Pansy, Garden Pansy	Viola tricolor var.
13.	Petunia	Petunia	Petunia hybrid
14.	Verbena	Verbena	Verbena sp.





Fig. 13 : Flower of the college premises

CHAPTER - 12

GREEN INITIATIVES

Katwa 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 Katwa 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.

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 CO₂. The tons of biomass are saved by this green computing practice

CHAPTER – 13

Consolidation of Audit Findings

Green Audit will create a greater appreciation and understanding of the impact of college activities on the environment. Katwa 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. Katwa 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.

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 on 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.

CHAPTER - 14

ConCl usion and ReCommendations

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

14.1 Suggestions

- a) Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- b) Increase recycling education on campus.
- c) Increase awareness of Environmentally Sustainable Development – Use every opportunity to raise public, government, industry, foundation, and college awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
- d) Collaborate for Interdisciplinary Approaches – Convene college faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- e) Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing strategy to reduce the environmental impact of its purchasing decisions.
- f) Increase reduce, reuse, and recycle education on campus.

14.2 Recommendations:

- a) *Declare the campus plastic free and implement it thoroughly.*
- b) *Avoid plastic/thermocool plates and cups in the college level or department level functions.*
- c) *Noise level monitoring shall be done as per the guideline of “Noise Pollution (Regulation and Control) Rules ‘2000’.*
- d) *The Biodiversity is to be maintained whole considering the plantation in future.*
- e) *Awariness among students and staff about green environment shall be done use tools like display boards.*
- f) *The surroundings of the College should be keep clean.*
- g) *New construction or development work has to be done without cutting down any tree.*
- h) *A closed area between main garden and office building seems to be requiring intense maintenance.*

Fire Extinguisher

- *Fire extinguisher are required to be kept within the College campus area.*
- *At least two 10 kg capacity extinguisher is to be placed on each end of the floor. Regular refilling should be ensured and date of refilling should be clearly marked.*

Medicinal Garden

- *Medicinal Garden should be keep clean. Systematic plantation program should be drawn and implemented.*

Energy Consumption

- *Solar Panel are to be installed on the roof of the building.*
- *Sensor light may be fixed in the toilets for conservation of energy.*
- *Replace incandescent and CFL lamps with LED Light*
- *Replace LCD computer monitors with LED monitors.*
- *Cleaning of tube lights/bulbs should be done on a regular basis to remove dust.*

Drinking Water

- *Adequate number of taps for safe drinking water should be placed at strategic locations.*

Waste Water

- *Waste water from all around the campus flows into the municipal drain and those drains must be cleaned in regular interval.*

Solid Waste

- *Vermy compost method should be adopted to convert solid waste into fertilizer and use for the garden.*
- *More dustbin should be arranged on every floor of the College*

E-Waste

- *A separate enclosure needs to be made for storage of scrap and E-waste materials.*
- *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.*
- *The College should take steps for disposal through the approved vendors.*
- *No other material can be kept in E-Waste room.*

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THE END