MUC WOMEN'S COLLEGE BURDWAN, PURBA BARDHAMAN

ESTD. 1955

REPORT ON GREEN/ENVIRONMENTAL AUDIT ACADEMIC PERIOD: 2022-'23

Prepared by The Green Audít Team The Uníversíty of Burdwan Purba Bardhaman

Schedule for Environmental/Green Audit

July 22, 2024 Time	Schedule	Venue
11:30 AM	Introductory Meeting	Principal's Office
12:00 NOON	Meeting with Coordinator IQAC and Members	Principal's Office
12:00 NOON	Presentation by Convener of Green Audit Committee& Members	Principal's Office
02:00 PM	Lunch	
02.30 PM	Interaction & Physical visit with Convener & Committee Members	Physical facility in and around the campus
03.00 PM	Visit to Campus	
04:45 PM	Exit Meeting	Seminar Hall, Academic Building
05:30 PM	Tea	

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I. Introduction

1. Introduction

Maharajadhiraj Uday Chand Women's College was established on 1955 and started withsubjects like Sanskrit, Bengali, English, History and Philosophy, later science courses were started in 1957.Since inception it is affiliated to the University of Burdwan. Initially, it was meant for disseminating higher education for the women in the local area. It was the first women's college in Burdwan district under the University of Burdwan, Burdwan. The establishment of MUC Women's College, Burdwan, Purba Bardhaman stands as a testament to the commitment to educational accessibility, addressing the needs of the girl students and fostering a conducive environment for higher learning. Now, College offers16 UG Hons. courses, 4 General one PG Course in English. Presently, there are 3 Girls' Hostels accommodating more than 300 students.

The College was first accredited by NAAC in 2004 with B+ Grade, during Second cycle it scored B+ in 2012 with CGPA of 2.72 followed by Third cycle on 2018 with 2.64 and Graded as B+.Now, the College voluntarily has started the Environmental/Green audit for the last year2022-'23 to look into its strengths and weaknesses and identify the scope of further improvement.

Audit Committee

The authority of the University of Burdwan has constituted a three members committee to conduct Environmental/GreenAudit of the MUC Women's College, Burdwan, Purba Bardhaman. The Audit Committee comprises the following members:

- Dr TanmoyDasgupta, Professor & Former Head, Deptt. of Business Administration, and Director, MMTTC, The University of Burdwan, Burdwan
- Dr ApurbaRatanGhosh, Professor & Head, Deptt. of Environmental Science, The University of Burdwan, Burdwan
- Dr GouriSankarBandyopadhyay, Principal, Syamsundar College, Shyamsundar, PurbaBardhaman

II. Objective & Scope of the Audit

Members along with the Teacher-in-Charge, Dr Mallika Chakraborty in presence of Convener of Green Audit Committee and IQAC members at a preliminary meeting, held on 22-07-2024 at 11.30 am, outlines the broad objectives of the environmental audit as an assessment of the College. Accordingly, the audit team members decided to look into the prevailing situation at the College along the following aspects in course of the audit.

The team is empowered and expected to express their views and give suggestions for the improvement of the systems being followed by the College.

II. Executive Summary

MUC Women's College, Burdwan, Purba Bardhaman started on 1955. In accordance with the "Format of Green Audit: Questionnaire", MUC Women's College, Burdwan, Purba Bardhamanis performed the audit on22nd of July, 2024. The purpose of the audit was to propose some best practices to be followed in near future in the campus which are in accordance with the Green Policy. With this in mind, the specific objectives of the

audit were to evaluate the adequacy of the management control framework of Environment Sustainability.

The analysis was based upon a physical examination of the different sectors including green areas*etc*., and standards that govern the environmental sustainability, and on the results of preliminary interviews with personnel considered key in the environmental management in the campus.

The methodology used included the physical inspection of the campus, review of the relevant documentation and interviews.

III. Observations

a. General

iii. The College comprises the total campus area of 23,471.8 sq. m. with a built up area of 8,810 sq. m. maintaining a green area of 14, 661.8 sq.m. in and around the campus.

College has a total campus area of 23,471.8 sq.m., built up area 8,810 sq. m.and green area of 14,661.8 sq. m. College has taken some efforts for sustainable development in the College campus and to maintain greenery.

1. College has constituted "Environment & Natural Resource Management Committee" and team members to help the Audit Team members.

2. Some of the best practices such as maintaining tree plantation, introducing plastic free zone, celebration of World Environment Day, Earth Day, World WaterDay, etc., are followed in the campus organized by the NSS.

3. College organises Tree Plantation Programs on regular basis; entire campus is divided into different plots for maintain the greenery as well as giving exposure to the students about green campus.

4. College has storing-cum-dumping pit. Disposal mechanism of all degradable and nondegradable solid wastes is followed its own system, local municipality collect these wastes for disposal.

5. E-wastes are stored in a dedicated place.

6. Collegefollows some practices relating to Environmental Awareness programmesby involving students, NSS/NCC.

7. College maintains the ecological balance in the campus through maintaining gardens.

8. Rainwater is collected in specific water tank and used purposefully.

9. College has taken initiative for preparation of composting pit/vermicomposting pit.

10. Proposal of preparation of definite Butter Fly Garden is initiated.

11. NSS units adopted one village Sahachetan near Burdwan Town and actively participate on *Swachha Bharat Abhiyan*.

13. College installed 22 KV solar panels in 2017; *ZillaParisad* has sanctioned 25 KV Solar Panels during 2013; College has 3 Green Generators for uninterrupted power supply.

On detailed review, it was observed that the college has already taken some measurements constitute "Green Audit Committee" to implement the Green Policy with applicable standards. In addition, College is taking care of to improve their efficiency, fairness and consistency.

IV. Suggestions

1. College is requested to constitute the "Eco-Club" properly and prepare the Green/Environmental Policy. During formation of "Environment & Natural Resource Management Committee" College should follow the composition, where Teacher-in-Charge/Principal will act as Chairperson/Chairman with inclusion of student members from SEM I, III & V.

2. College is requested to maintain the gardens at different locations through students of different departments.

3. Medicinal Garden should be maintained properly.

4. Butterfly Garden be initiated in order for proper maintenance.

5. Students should be trained to handle the PBR through workshop *etc.*, mapping of plants be done accordingly.

6. Safe disposal methods should be adopted for solid, liquid, wooden wastes, electrical wastes, etc., through proper disposal methods.

7. Existing compostingsystem be managed properly.

8. Formal MoU with Local Municipality be maintained for long-term basis and periodical monitoring.

9.College should maintain the 'Green Budget' for the said purposes.

10. Plantation program be monitored and periodical maintenance of plants be followed through students of different departments.

AUDIT FRAMEWORK AND DETAILED ANALYSIS

V. Detailed findings & Analysis

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

Control objectives	Control(s)	Audit Observations
Maximize the	Reduce the absolute amount of waste that	The College has used some control
proportion of waste	it produces from the Institute & Staff	measures to reduce the waste that it
that is recycled &	offices.	produces from the departments, staff
minimize the quantity		offices, inside Campus, etc.
of non-recyclable		Segregation method is followed
refuse		properly by installing collecting bins
		in different locations of the buildings.
	Make full use of all recycling facilities	College should dispose all wastes
	provided by City Municipality and private	through local municipality.
	suppliers, including glass, cans, white,	
	coloured and brown paper, plastic bottles,	
	batteries, print cartridges, cardboard and	
	furniture.	The College uses different king for
	Compost, or cause to be composted, all organic waste, green waste and un-	The College uses different bins for disposal of different types of wastes.
	recycled cardboard produced in or	The fallen dead leaves from the
	collected from kitchens, gardens, offices	garden be managed properly in the
	and rooms.	composting/cistern pit.
	Recycle or safely dispose of white goods,	Safe disposal methods should be
	computers and electrical appliances.	adopted for electrical wastes, printer
		cartridges, etc., through proper
		disposal methods.
	Use reusable resources and containers and	College should take proper steps for
	avoid unnecessary packaging where	management of vegetable, food wastes
	possible	produced from canteen/Hostels.
	Provide sufficient, accessible and well-	The College has limited scope of
	publicized collection points for recyclable	accessible and well-publicized
	waste, with responsibility for recycling	collection points for recyclable waste.
	clearly allocated	
	Make specific arrangements for events,	
of wastes during	such as cultural Events, internal and	special events or occasions, such as
special events/	external seminars and conferences, where	Cultural Events, International and
occasions	significant recyclable waste is likely to be	National seminars and Conferences,
	produced, in order to both minimize the	etc., be disposed through own system
	waste produced and maximize what is	
	recycled/reused	

Control objectives	Control(s)	Audit Observations
	Promote reuse of items and waste recycling among staff, students and conference guests through training, posters and incentives	The College has limited scope of reuse of items and waste recycling among staff, students and conference guests through some incentives.
	Dispose all waste, whether solid or otherwise, in a scientific manner and ensure that it is not released directly to the environment	Yes, the College is trying to follow environment friendly disposal management system and ensures that it is not released directly to the environment.
Reduce energy consumption, especially of energy derived from fossil fuels	Support renewable and carbon-neutral electricity options on any energy- purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.	College follows paper-less communications through using digital media like Website notice, Whatsapp, generate e-noticefor academic/ administrative purposes.
	Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon- neutral electricity	College has to maintain sources of renewable energy and carbon-neutral electricity like solar panels.
	Look into the possibility of on-site micro- generation of renewable electricity.	College has proposed for solar street lamps.
	Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs	The College is using LED light as much as possible.
Effective energy consumption and management practices	Encourage staff, students and conference guests to save energy through visible reminders, incentives and information to increase awareness. This particularly concerns turning off electrical appliances when not in use in both communal and residential rooms	College has a mechanism to reduce the misuse of electricity by turning off the appliances when not required through MCB. All the stakeholders are aware and doing their bests and practices to save electricity.
	Ensure that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available	Students and all the members are used to follow this practice.
	Ensure that the equipment's running on standby mode, reduce the energy consumption on standby mode or minimize the running of equipment's on standby mode	Maintaining energy saving mechanism for most of the instruments; some of the equipment's are running on standby mode.

Control objectives	Control(s)	Audit Observations
	Purchase efficient and environmentally sound appliances and consider replacing old stock with 'greener', more efficient alternatives.	Presently, College is using environmental-friendly appliances as much as possible and taking initiative replacing all the tube lights with LEDs, <i>etc.</i> , as effective alternatives.
Minimize the use of unsustainable transport	Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staff and students.	The College issituated at the heart of the Town and is well connected through bus services& rail; usually, most of them avail bus& rail services.
	Reduce the proportion of travel on the University/Institute business carried out in private transport and eliminate unnecessary and inefficient use of the University/Institute vehicles Promote car sharing / car pool among the students and faculty members	College does not have any common bus services to all stakeholders. College has car parking and cycle shed for students as well as staff members. No, the College does not promote car sharing/car pool among the students and faculty members.
Minimize consumption of water	Repair sources of water leakage, such as dripping taps and showers as quickly as possible.	College should follow regular checking and maintenance of pipelines to control the water wastage through dedicated personnel.
	Install appliances which reduce water consumption Encourage a decrease in water usage among staff, students and conference	Practised as much as possible. All the stakeholders of the College are encouraged in judicious use of water.
	unong start, statemes and conference guests Use an efficient and hygienic water storage mechanism is to minimize the loss of water during storage	College is taking some steps to aware about use of hygienic water, proper storage of water. Advanced Sensor-based system be introduced to minimize the loss of water during storage, as well as in some places for effective saving of electricity.
	Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity	Inside the Campus building, there are existing two water cooler & purifier installed in the strategic location for the students and other members; <i>proper maintenance be adopted</i> .
	Install Water recycling mechanism, such as rain water harvesting system	Rainwater harvesting system is used purposefully. It can be used for gardening and cleaning; College may develop groundwater recharge system more judiciously.

Control objectives	Control(s)	Audit Observations
Minimize the risk of environmental health	Ensure that all cleaning products used by the University/Institute staff have a minimal detrimental impact on the environment, i.e., are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations	Negligible amount of cleaning/washing liquids are used in the College. <i>College may maintain 'Green Budget' for</i> <i>the said purposes.</i>
	Minimize the use of fertilizers and pesticides in the University/Institutional gardens, opting for the use of compost produced on site wherever possible	College uses mostly organic fertilizersfor maintenance of gardens, infected plants as and when required basis.
	Dispose the chemical waste generated from the laboratories in a scientific manner	Disposal of solid wastes are managed. Drainage of liquid wastes from wash rooms, labs and other similar sources be managed properly. Liquid wastes from Chemistry department be managed properly.
	Reduce the practice of burning plastic and other materials that emit the harmful gas on burning is prevented in the campus.	No such burning.
Maintenance of green campus	Ensure the green environment	College is positive about increasing greenery. Tree plantation programmes are followed in different occasions on year-wise.
	Establish a Garden in the campus	Students should be trained to handle People Biodiversity Register (PBR).
	Encourage the faculties and students to plant trees in the garden	College conducts tree plantation programmes through students and staff members on year-wise. Choice-plantation and fruit-plantationsbe followed on regular basis considering the suitability of the region.
	Reviews periodically the list of trees planted in the garden periodically	Periodical maintenance of gardens/plants be followed through student members.
Ensure that environmental awareness is created	Conduct environmental awareness workshops as a part of the program.	College celebrates World Environment Day, Earth Day, World Animal Welfare Day, <i>etc.</i>
	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	College conducts environmental awareness programmes to ensure environmental sustainability.
	Reduce the rate at which the University/Institute contributes to the depletion and degradation of natural resources	College is not directly or indirectly responsible in depletion and/or degradation of natural resources.

Control objectives x	Control(s)	Audit Observations
	Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service	Compulsory ENVS paper as per University guidelines for all the students of all streams are mandatory to have an awareness on Environmental.
Ensure that the buildings conform to green standards	Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission	Presently, there is no proposal of new construction.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Establish the University/Institute Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy	College should prepare College Environmental policy.
	Ensure that on the Nature Club/Environmental Committee there will be appropriate representatives of the relevant university departments and authorities – such as catering, gardening, maintenance, cleaning and finance	College may constitute one Eco Club for better functioning.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Ensure that on the Environmental Committee there will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact	College is required to reframe the Committee time-to-time; one Green Officer may be included in this Committee for maintaining budget.
	Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will monitor progress and set measurable targets wherever possible	College may adopt some steps for better disposal of 'Plastic Wastes'.
	Ensure that the Environmental Policy is enforced regardless of whether its requirements exceed the mandate of the law	Beautification and cleanliness be maintained involving students of different departments; the Green Policy of the College be framed.
	Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice	Members of the team constituted by the College authority are actively engaged in maintaining green practices.
	Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings	First 'Green Audit' is conducted on 22 nd of July2024 based on the report of year 2022-'23.

VI. Recommendations

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Considering the audit, for	allowing recon	imendations were	made to the	management
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Criteria	Recommendations		
Publication of Audit Report	1. Formation of the proper "Environmental Committee"		
	2. Resolutions of the Committee along with audit report be published in the College		
	website.		
Maximize the proportion of	1. Composting system be developed for degradable/bio-wastes in a proper way.		
waste that is recycled &	2. College may go for partnership with <i>Local Municipality</i> in monitoring the disposal		
minimize the quantity of non-	of solid wastes through sharing some outreach programs also.		
recyclable refuse	4. Composting/Vermicomposting should be prepared considering its vegetable		
	wastes, food wastes from canteens and campus litters.		
Reduce energy consumption,	1. Use energy efficient lighting/solar light fully in and around the campus; Ecological		
especially of energy derived	street/Green corridor may be developed in and around the campus.		
from fossil fuels,	2. The control switch, MCB for monitoring of energy and sensor-based system for		
	water consumption building wise/department wise be maintained through the		
	involvement of student members.		
	3. Pedestrian access be marked.		
Maintenance of Campus and	1. PUC (Pollution under control) certificate for all the vehicles entering the campus		
biodiversity	to be made mandatory and to be checked by security.		
	2. Students be aware importance of Medicinal Gardens and PBR for different		
	locations. Proper training, workshop on maintenance of PBR for local villages and		
	different locations as an outreach program be initiated.		
	3. Choice-plantation, fruit-plantation, artificial nesting, <i>etc.</i> , be followed to maintain		
	attract birds and other animals within the campus.		
	4. Proposal of Butterfly Garden may be initiated.		
Proper cleaning of water	1. Management of dead leaves, litters of trees inside the campus be taken care off on		
storage Tanks	regular basis.		
	2. Sensor-based system be maintained for checking of wastage of tank water.		
Project-based learning on	1. Creation of opportunity to start with technical, skill-oriented and hands-on-training		
Environment related subjects	programmes for environmental monitoring.		
	2. Recognition/Awards on green & clean campus from authorised		
	persons/organisations.		

VII. Objectives and Scope

The purpose of this audit was to ensure that the Green Management Practices are followed and implemented in the campus, across all departments, administrative bodies and students.

VIII. Methodology

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

a. In order to meet these objectives, this audit was based on report submitted by the College authority and reviewing of relevant documents as far as possible and interviews with authority, Coordinator and staff members physically.

b. Review of the Documentations

c. For the purpose of this audit the Green Policy of the institute was reviewed. Other relevant standards, Green audit framework *etc.*, was also considered.

Interviews

Interviews were conducted with the Teacher-in-Charge, Green Audit Committee and IQAC Coordinator and also members of the Committee.

Physical Inspection

Physical inspection was made on 22nd of July, 2024 and this audit report was prepared based on the physical verification and validation and interaction with the members of the College.

IX. Declaration

I agree with all the recommendation and observations mentioned in this report.

Date: 22/07/2024 Place: MUC Women's College Burdwan, Purba Bardhaman

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Signed by College Teacher-in-Charge with Seal **Teacher-in-Charge** M.U.C. Women's College Purba Bardhaman

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AUDIT REPORT ON ENVIRONMENTAL AUDIT/ GREEN AUDIT

CERTIFICATE

This is to certify that the Environmental Audit/Green Audit Report and Energy Monitoring & Management System followed at MUC Women's College, Burdwan, Purba Bardhaman(AISHE Code: C-44657) is based on the original data collected during the period of 2022-'23. This has been assessed and is applicable to providequality ambience for continued Higher Education, Training and Mental health to the students for their smart future and career. Further, it is certified that the baseline data was prepared by internal Environment & Natural Resource Management Committee team members of MUC Women's College, Purba Bardhaman and submitted to us. The content of the baseline data of the study and Energy Monitoring & Management System has been personally verified by the Expert Team "Green Audit Team" constituted by the University of Burdwan, Burdwan for validity and reliability. The data used in the study are original in nature and have not been presented or published elsewhere. Data & Photographs used in the report are taken by the College 'Green Audit Committee' team members during preparing their Report of the concerned year 2022 - '23.

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Date: 22/07/2024

To Dr Mallika Chakraborty Teacher-in-Charge MUC Women's College Burdwan Purba Bardhaman West Bengal

Website: www.mucwcburdwan.org E-mail: mucwcburdwan@gmail.com

Subject: Environmental Audit Report Submission from Experts

Dear Sir/Madam,

After verification of all the aspects in the College and necessary assessment of the report on "Environmental/Green Audit" mentioning the "Energy Monitoring & Management System" submitted by your College for the period of 2022-'23, here, we are submitting the Report of "Environmental/Green Audit" of your College of the period of 2022-'23 for your kind perusal in the attached sheet. We request you to please acknowledge and oblige.

Sincerely yours,

Dr Fanmoy Dasgupta Professor & Head Deptt. of Business Administration The University of Burdwan Burdwan

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MAHARAJADHIRAJ UDAY CHAND WOMEN'S COLLEGE

Affiliated to

The University of Burdwan



Green Audit / Green Campus

Arranged by

Department of Botany

MAHARAJADHIRAJ UDAY CHAND WOMEN'S COLLEGE

B.C. Road, Purba Burdwan, West Bengal - 713 104, India

GREEN CAMPUS FOR HEALTHY ENVIRONMENT:

BOTANY DEPARTMENT

MAHARAJADHIRAJ UDAY CHAND WOMEN'S COLLEGE B.C. ROAD, BURDWAN- 713 104

1. About College:

Socio-economic developmental ideals cannot be achieved without ensuring participation of women in Higher Education. Eminent educationists and social reformers of Burdwan felt this truth way back in the 1950's, and a Women's College was established in the palace gifted by Maharajadhiraj Uday Chand Mahatab, former Raja of Burdwan, on 28th July 1955. Later, a portion of Anjuman Kachhari attached to the palace was also gifted to the College. As a mark of gratitude, the institution has been named after Maharajadhiraj Uday Chand Mahatab and known as Maharajadhiraj Uday Chand Women's College (M.U.C. Women's College).

Initially it was affiliated to the University of Calcutta; the University of Burdwan became the affiliating university after the establishment of the university in 1960. The college had a modest beginning with only Intermediate Arts and General Degree Course in Arts. Over time, it responded to the growing demand for higher education among women by introducing Honours Courses in various Arts and Science subjects. As the institution flourished and the number of students increased, the college introduced a Morning Shift in 1970, running parallel to the Day Shift.

M.U.C. Women's College evolved into a prestigious institution in the Burdwan District, offering not only traditional education but also responding to the changing needs of women by introducing technical-vocational courses since 2005. The college, recognized by the UGC and accredited by NAAC, has been visited by notable figures such as Hon'ble Ms Padmaja Naidu, the first woman Governor of West Bengal, and Dr. Bidhan Chandra Roy. Celebrating its Golden Jubilee in 2004-05 and Diamond Jubilee in 2014-15, the college remains committed to academically and culturally enlightening women, contributing to their empowerment in society.

2. Green Audit:

The Green Audit encompassed many key areas, these areas included:

- Optimal Daylight Design & Ventilation
- Water Efficiency & Conservation:
- Wastewater Management
- Energy Efficiency & Conservation
- Temperature and Acoustic Control
- Paper Waste Reduction
- E-Waste Management:
- Solid Waste Management:
- Green Landscaping

2.1. Optimal Daylight Design & Ventilation

- All the building receives good daylight due to the large windows.
- Corridors are wide with good ceiling height.
- Classrooms also have wide doors and large windows. Windows are kept open to receive air and sunlight.
- Due to the location and on ground floor certain room like library in Golden jubilee building, Philosophy Department, in Heritage building (a portion), cash, office and account section

do not receive ample natural light. Hence these rooms are provided with LED and CFL tube lights.













Fig: Good quantity of sunlight enters class room, laboratory, staircase, and corridor and some building areas not received ample sunlight.

2.2. Water Efficiency & Conservation:

• Water from bore well is pumped to storage tank (10 KL capacity -32 in Nos.) located on different building terrace. Stored water is used for flushing and cleaning.

• For the maintenance of water purifiers and aqua guards, the

• college has signed AMC (Annual Maintenance Contract) with a local agency.

• Mops and floor cleaner are used for floor cleaning.

• If water leakage is observed, in-house plumber (vendor listed Plumber) is called immediately to attend to the complaints.

• Rainwater harvesting recharge pits are provided for bore wells. There is one open well in the institute. This storage water uses for gardening.



Fig: Rain water harvesting

2.3. Wastewater Management:

- Sanitary wastewater generated from washrooms is connected to sewerage system provided by Burdwan Municipality.
- Chemical wastewater generated mainly from Chemistry department in chemical labs in the institute is treated with maintained charcoal pit which then connected to sewerage system.

2.3.1. Disposal of wastes generated in Microbiology Laboratories including other department of biological sciences i.e., Botany, Nutrition and Zoology.

- Three major categories of waste materials are generated in our Microbiology laboratory-
- (a) Chemical wastes (approx 1-2 lt/month), which may be again divided into two
- subcategories-
- (i) Toxic- such as, Ethidium bromide (a potent carcinogen, used in the
- visualization of DNA on agarose gel), acrylamide, methanol, various
- types of acids and dyes, etc.
- (ii) Non-toxic- such as different medium components
- (b) Organic wastes (approx. 10-12 kg/ month)- used bacteriological and fungal media,
- non-pathogenic bacterial and fungal cultures, cotton, brown papers, etc
- (c) Pathogenic and unknown microorganisms isolated from various ecological and
- clinical samples; used human blood samples.
- Toxic chemicals are neutralized using high-alkaline solutions and deposited in an
- activated charcoal chamber maintained by college.
- Non-toxic medium components and chemicals are released through the drainage system.
- Used bacteriological culture medium along with pathogenic and nonpathogenic bacterial
- Live cultures, used cotton plugs, papers, and similar materials are autoclaved in autoclavable bags and plant specimens and other biological samples are also processed accordingly. The college sweeper then disposes those bags and biological waste in municipal waste vats.
- The byproducts of mushroom cultivation and bio-fertilizers (*Azotobacter*, *Rhizobium*) and phosphate solubilizing bacteria are applied to garden to increase in garden soil fertility.



Fig: Activated charcoal pit and dedicated autoclave for pathogenetic waste material

2.4. Energy Efficiency & Conservation:

- 2.4.1. Electricity:
 - A single electricity meter is provided for the entire complex including hostel and staff quarter. The monthly average electricity consumption from January to February 2023 is 15343KWh (units).

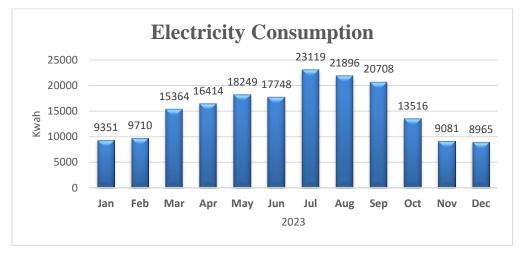


Fig: The above graph indicates that the energy consumption in Jan to Dec – 2023. The maximum energy consumptions for 2023 are in the month of July and the minimum energy consumption is in Nov. Further we presume that the institute has summer recess in May / June each year and Nov-Feb comes in winter season, the consumption in these months is lower consumption in compare to Jul, Aug and Sep.

The areas of major consumption of electricity are:

- Lights (LED and CFL) 507 approximately
- Fans 308 nos. approximately
- Air Conditioners 36 nos.
- Computers 26 units
- Printers 20 units
- Projector 18 units
- Refrigerator-15
- The refrigerator installed are with three- to five-star ratings (standards set by Bureau of Energy Efficiency (BEE)]
- All the computers have LED screens; Computers are always kept on standby mode with power saving screensavers.
- Multiple tube lights and fans are connected to MCB.
- There is renewable source of energy used e.g. Solar panel to meet the electricity requirements in the college.





Fig: Solar panel installed in the rooftop

• Solar heater has been installed in hostel roof for student hostel.



Fig: Solar heater

• Solar street light also installed in college premises.



Fig: Solar street light

2.4.2. On site energy generation (usage of LPG/ fuel):

- LPG gas cylinders line is used in chemistry laboratories and in the hostel building for cooking. Gas cylinders are refilled as and when required.
- There are 2 diesel generators (green / sound proof) used in the premises.



Fig: Green generator sound proof

2.5. Temperature and Acoustic Control:

• The front side of college is very close road side so there is little beat of noise pollution. In this context college has done various type of tree plantation around the building which help in reducing temperature and acoustic control.

2.6. Paper Waste Reduction:

Being academic institution, waste paper is the main solid waste generated in the premises. The institution has taken steps to minimise and avoid paper usage.

- Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalisation (scanning) is practised.
- The college library is connected to under the Inter Library Loan facilities with Online Public Access Catalogue (OPAC), COHA, INFLIBNET N-List.
- Internal notices and communications are through E mail/SMS/ WhatsApp etc
- Faculty and office staff uses old papers and envelops for internal usages as rough work, file markers, page separators etc
- Paper notices are displayed on the notice boards. The dissertation reports, journals, and answer papers are stored in archives.

2.7. E-Waste Management:

- College is digitalized to some extent.
- The institute has 126 PCs, 15 printers, projector 18 in working condition. The generation of E-waste is also large.
- All E-waste is collected from respected department and store in a dedicated "E- waste" store room, this e-waste is the given to authorise recycler.



Fig: E-waste room

2.8. Solid Waste Management:

- Hostel and staff quarter are the main area where biodegradable waste is generated.
- The amount of biodegradable waste generation is nearly 14-15 kg/day.
- In other areas like classrooms, office it is mostly paper waste and plastic wrappers.
- Waste is placed directly into the dust bin or vat and then collected by a sweeper who hands it over to the municipal garbage van/vat.



Fig: Use dust bin for solid waste



Fig: Initiative taken by students for green and clean campus



Fig: Steps towards plastic free campus

2.9. Green belt/ Landscaping:



COLLEGE CAMPUS PLANT BIODIVERSITY

Our college campus is gifted with significant green cover. There are more than 150 important plants counted in the campus along with climbers & seasonal/ornamental one. However, considering the future environmental

scenario, plantation with scientific and systematic approach has been recommended for the entire college campus. A botanical garden with special consideration to rare and endangered plant has been proposed within the campus under the supervision of botany department.

Activities organized to create greenery and its conservation at college campus is as follows-

- Uses of medicinal plants.
- Identification of plants species.
- Conservation of some threatened plants.
- Plantation of different plant species.

Uses of medicinal plants:

There are many medicinal plants planted in college "Medicinal plant garden". The plants have medicinal value but students don't have knowledge how to use and they can't identify the particular plants, so faculty members of Botany Department help them to identify with scientific name and provide information about medicinal uses of the plants.

Identification of plant species:

There are so many plant species present at college campus. The faculty members of the Botany Department audited and taxonomically identified various plant species including herbs, shrubs and trees. And tagging was done on to the plants.

Conservation some threatened and exotic plants:

The best practices were adopted to conserve some threatened & exotic plants. Moreover, some exotic beautiful plants were planted in garden and other parts of college campus.

Herbal Garden ("Dr Janaki Ammal Herbal Garden"):

The Dr. Janaki Ammal Herbal Garden has been established on the college campus (09.02.24) to provide students with foundational knowledge of herbal

medicine. This garden features a diverse collection of significant herbs, carefully selected to enhance the educational experience.

By incorporating a variety of important herbs, the garden serves as a living laboratory for students to explore and understand the properties and uses of herbal drugs. This hands-on approach not only enriches their theoretical knowledge but also offers practical insights into the world of herbal medicine.



Fig: Herbal Garden

Plantation of different plant species:

To develop eco-friendly atmosphere and to maintained Phyto diversity at the college campus, plantation program is organized every year by involving all students including NSS, Principal / TIC, faculty members of all departments and staff member. Throughout the year different plantation programs were organized. Indoor plants were potted along the corridors and entrance of the building. To keep the campus green, we regularly nourish and maintain the gardens. Large trees are planted in the peripheral side of our playground. Some botanical plant specimens have been planted in our both medicinal garden and college campus which are regularly used for practical classes. Moreover, every

year we try to plant new trees. Seasonal flower garden is also a unique feature of this college.

After a daylong survey, we have divided the college campus into different block. The following table shows different blocks along with the number of plant species and their local and scientific names.



Fig: Medicinal plant garden of the plants

	A. Front side of College Campus (Open Space)				
Sl.No.	Local Name	Scientific Name	Quantity		
1.	Bokul	Mimusops elengi	1		
2.	Bel	Aegle marmelos	2		
3.	Segun	Tectona grandis	4		
4.	Neem	Azadirachta indica	1		
5.	Mohua	Madhuca longilofia	1		
б.	Ruber plant	Ficus elastica	1		
7.	Kathal	Artocarpus heterophyllus	2		

8.	Champa	Michelia champaca	3
9.	Debdaru	Polyalthia longifolia Polyalthia longifolia	2
10.	Dracaena	Dracaena sp	5
11.	Fish tail Palm	Caryota sp	20
12.	Panthopadap	Ravenala madagascariensis	2
13.	Krishnachura	Caesalpinia pulcherrima	1
14.	Mehogoni	Swietenia mahagoni	3
15.	Peara	Psidium guajava	3
16.	Tagar	Tabernaemontana divericata	15
17.	Aam	Mangifera indica	4
18.	Dracaena	Dracaena sp	1
19.	Jhau	Thuja (large round)	13
20.	Kanta jhau	Thuja	33
21.	Рере	Carica papaya	1

	B. Garden in the Front side of College Campus				
Sl.No.	Local Name	Scientific Name	Quantity		
1.	Water weeds	Hydrilla	One pot		
2.	Nayantara	Catharanthus sp	2		
3.	Cycas	Cycas sp	3		
4.	Boat lily	Rhoeo discolor	Several small		
			individuals		
			together		
5.	Jaba	Hibiscus rosa-sinensis	2		
б.	Ban Chalta	Dillenia pentagyna	1		
7.	Fern(Durgajhap)	Lygodium flexosum	1		
8.	Orchid	Eulophia explanata	2		
9.	Kali musli/Talamuli	Curculigo orchioides	2		
10.	Ishwarmul/Hansolata	Aristolochia indica	2		
11.	Golap	Rosa sp	4		

12.	Rangan	Ixora sp	3
13.	Sthalapadma	Hibiscus mutabilis	1
14.	Pati limbu	Citrus auruntiifolia	2
15.	Hasnu hana	Cestrum nocturnum	1
16.	Eucalyptus gach	Eucalyptus sp	1
17.	Bohera	Terminalia belierica	1

C. Girls hostel block			
Sl.No.	Local Name	Scientific Name	Quantity
1.	Aam	Mangifera indica	7
2.	Kathal	Artocarpus heterophyllus	6
3.	Asoke	Saraca asoca	1
4.	Sabeda	Manilkara zapota	1
5.	Dalim	Punica granatum	1
6.	Payera	Psidium guajava	6
7.	Sajne gach	Moringa oleifera	6
8.	Segun	Tectona grandis	2
9.	Mehogoni	Swietenia mahagoni	1
10.	Falsa	Grewia asiatica	1
11.	Debdaru	Polyalthia longifolia	3
12.	Golap	Rosa sp	4
13.	Dracaena	Dracaena sp	1
14.	Jaba	Hibiscus rosa-sinensis	2
15.	Kolke	Thevetia neriifolia	2
16.	Kanchan	Bauhania variegata	2
17.	Krishnachura	Caesalpinia pulcherrima	2
18.	Tentul	Tamarindus sp	1
19.	Kochu	Colocosia sp	Numerous
20.	Kuksim	Vernonia cineria	Numerous
21.	Fish tail Palm	Caryota sp	12
22.	Batabi lebu	Citrus limetta	1
23.	Pati limbu	Citrus auruntiifolia	2

24.	Tagar	Tabernaemontana divericata	6
25.	Orchid	Vanda sp	Numerous
26.	Reri	Ricinus communis	1
27.	Рере	Carica papaya	10
28.	Bandar lathi	Cassia fistula	1
29.	Jamrul	Syzygium samarangense	1

	D. Back side of old building			
Sl.No.	Local Name	Scientific Name	Quantity	
1.	Kamini	Murraya paniculata	3	
2.	Batabi lebu	Citrus limetta	1	
3.	Chatim	Alstonia scholaris	1	
4.	Payera	Psidium guajava	3	
5.	Aam	Mangifera indica	4	
6.	Khatal	Artocarpus integrifolia	4	
7.	Рере	Carica papaya	2	

E. Boundary line of Play Ground			
Sl.No.	Local Name	Scientific Name	Quantity
1.	Karabi	Nerium sp	2
2.	Christmas tree	Araucaria sp	2
3.	Tagar	Tabernaemontana divericata	4
4.	Golap	Rosa sp	6
5.	Jaba	Hibiscus rosa-sinensis	3
6.	Rangan	Ixora coccinea	2
7.	Peyara	Psidium guajava	6
8.	Jhinti	Barleria cristata	2
9.	Sonajhuri	Acacia auriculiformis	4
10.	Sandhamoni	Mirabilis jalapa	6
11.	Kadam	Anthocephalus cadamba	1
12.	Рере	Carica papya	4

13.	Neem	Azadirachta indica	3
14.	Aam	Mangifera indica	4
15.	Khatal	Artocarpus integrifolia	1
16.	Khat golop	Plumeria sp	1
17.	Mehogeni	Swietenia mahagoni	1
18.	Belful	Jasminum sp	2
19.	Kamini	Murraya paniculata	2
20.	Dumur	Ficus cunia	1
21.	Kola	Musa sp	2
22.	Neem	Azadiracta indica	2
23.	Tentul	Tamarindus sp	1
24.	Sajne	Moringa oleifera	2
25.	Bel	Aegle marmelos	1
26.	Kolke	Thevetia neriifolia	2
27.	Radhachura	Delonix regia	1
28.	Fish tail Palm	Caryota sp	20
29.	Aswatha	Ficus religiosa	1
30.	Shal	Shorea robusta	1
31.	Bakul	Mimusops elengi	1
32.	Begun	Solanum melongena	4
33.	Nayantara	Catharanthus sp	2
34.	Gandha	Tagetes patula	8
35.	Chandramallika	Chrysanthemum sp	6
36.	Atosi/ jhumjhumi	Crotalaria sp	1
37.	Lili	Amaryllis sp	2
38.	Chatim	Alstonia scholaris	1
39.	Kanchan	Bauhania variegata	1
40.	Bhumi amla	Phyllanthus niruri	Numerous
41.	Mukto jhuri	Acalyphy indica	Numerous
42.	Barokarni	Euphorbia hirta	Numerous
43.	Khetpapra	Oldenlandia corymbosa	Numerous
44.	Kuksim	Vernonia cineria	Numerous

45.	Tridhara	Tridax procumbens	Numerous
46.	Chaya	Aerva sp	Numerous
47.	Telakucha	Coccinia grandis	Numerous
48.	Ogiera	Eleutheranthetra ruderales	Numerous
49.	Chinese brake fern	Pteris vittata	Numerous
50.	Kansira	Commelina benghalensis	Numerous
51.	Amrul	Oxalis corniculata	Numerous
52.	Kukursunga	Blumea lacera	Numerous
53.	Kalmegh	Andrographis paniculata	Numerous
54.	Punanava	Boerhaavia repens	Numerous
55.	Clock plant	Malvastrum tricuspidatum	Numerous
56.	Siam weed	Eupatorium odoratum	Numerous
57.	Salpani	Desmodium gangeticum	Numerous
58.	Fern	Christella dentata	Numerous
59.	Kochu	Colocosia sp	Numerous
60.	Pindi	Rungia pectinata	Numerous
61.	Blue trumpet	Ruellia tuberosa	Numerous
62.	Kanta note	Amaranthus spinosus	Numerous
63.	Durba ghas	Cynodon dactylon	Numerous
64.	Sursuri ghas	Eragrostris tenella	Numerous
65.	Chorkanta	Chrysopogon aciculatus	Numerous
66.	Crowfoot	Dactyloctenium sp	Numerous
67.	Ghrita kumari	Aloe vera	4
68.	Lanka	Capsicum annuam.	6
69.	Bokul	Mimusops elengi	1

	F. Medicinal plant garden				
Sl.No	Local Name	Scientific Name	Quantity		
1.	Satamuli	Asparagus racemosus	3		
2.	Sarphagandha	Rauwolfia serpentina	4		
3.	Kanakchandrika	Rauwolfia canescens	1		

4.	Arrowroot	Maranta arundinacea	6
5.	Citronella	Citronella nardus	Numerous
6.	Ranchita	Pedilanthus tithymaloides	2
7.	Aswagandha	Withania sominifera	1
8.	Pashanvedi	Coelous froskholii	8
9.	Bamanhati	Clerodendron siphonanthus	5
10.	Chandan tulsi	Ocimum canum	Numerous
11.	Sankar-jata	Uraria picta	5
12.	Mahabringaraj	Wedelia calendulacea	7
13.	Sada chita	Plumbago zeylanica	8
14.	Khas	Andropogon muricatus	Numerous
15.	Rambask	Justicia adhatoda	1
16.	Haritaki	Terminalia cirrina	1
17.	Choto elachi	Elettaria cardamomum	5
18.	Curchi	Holerrhena antidisentrica	4
19.	Lotcan	Bixa cordifolia	4
20.	Pipal	Piper longum	2
21.	Labanga	Syzygium aromaticum	1
22.	Daruchini	Cinnamomum zeylanicum	1
23.	Sankha puspa	Canscora decusatas	6
24.	Jarool	Lagestroemia speciosa	1
25.	Google	Commiphora weightii	1
26.	Hena	Lawsonia inermis	4
27.	Sada ata	Annona squamosa	1
28.	Sada Chandan	Santalum sp	1
29.	Bahera	Terminalia belerica	1
30.	Kaju	Anacardium occidental	2
31.	Kamranga	Arerrhoa carambola	1
32.	Falsa	Grewia asiatica	1
33.	Pathar kuchi	Bryophyllum pinnata	20
34.	Anantamul	Hemidesmus indicus	4
35.	Jasti modhu	Glycyrrhiza glubra	5

26	D 1 1'		
36.	Babchi	Psoralea coryfolia	6
37.	Basak	Adhatoda vasica	2
38.	Cinchona	Cincona sp	4
39.	Lajjaboti	Mimosa pudica	4
40.	Karabi	Nerium indicum	2
41.	Gandha bhadulia	Paederia foetida	4
42.	Palash	Butea monosperma	1
43.	Hijol	Baringtonia acutangula	1
44.	Pan karpur	Cinnamomum camphora	1
45.	Karpur	Ocimum kilimandscharium	1
46.	Sodhal	Intsia retusa	1
47.	Grita kumary	Aloe vera	8
48.	Dalim	Punica granatum	3
49.	Sajne gach	Moringa oleifera	2
50.	Khatal	Artocarpus integrifolia	2
51.	Bel	Aegle marmelos	2
52.	Atosi/ jhumjhumi	Crotalaria sp	2
53.	Aswatha	Ficus religiosa	1
54.	Shal	Shorea robusta	5

	G. Staff quarter block			
Sl.No	Local Name	Scientific Name	Quantity	
1.	Chinese brake fern	Pteris vitata	Numerous	
2.	Soft fern	Christella dentate	Numerous	
3.	Mango	Mangifera indica	06	
4.	Chatim	Alstonia scholaris	01	
5.	Neem	Azadiracta indica	03	
6.	Kanchan	Bauhania variegata	01	
7.	Tagor	Tabernaemontana divericata	04	
8.	Kolke	Thevetia neriifolia	02	
9.	Golap	Rosa sinensis	06	

10.	Sandha moni	Mirabilis jalapa	04
11.	Peyara	Psidium guajava	05
12.	jam	Syzygium cumini	01
13.	Khatal	Artocarpus integrifolia	05
14.	Kola	Musa sp	04
15.	Korobi	Nerium oleander	03
16.	Durba ghas	Cynodon dactylon	Numerous
17.	Sursuri ghas	Eragrostris tenella	Numerous
18.	Punarnava	Boerahaavia diffusa	Numerous
19.	Blue trumpet	Ruelia tuberose	Numerous
20.	Kuksim	Vernonia cinerea	Numerous
21.	Kanta note	Amaranthus spinosus	Numerous
22.	Debdaru	Polyalthia longifolia	1
23.	Shiuli ful	Nyctanthes arbour-tristis	1
24.	Kamini	Murraya paniculata	2
25.	Pathabahar	Unidentified	2
26.	Mukta jhuri	Acalypa indica	Numerous
27.	Curry pata	Murraya koenigii	2
28.	Kalmegh	Andrographis paniculata	Numerous
29.	Tridax	Tridax procumbens	Numerous
30.	Golap jamun	Syzygium jambolanum	1
31.	Bel	Aegle marmelos	1
32.	Рере	Carica papaya	2
33.	Arhar	Cajanas cajan	1
34.	Jaba	Hibiscus rosa-sinensis	2
35.	Mousumbi lebu	Citrus limetta	1
36.	Lanka	Capsicum annuam.	10
37.	Tal gach	Borassus flabellifer	2
38.	Belful	Jasminum sp	1
39.	Gandga	Tagetes patula	10

H. Garden near RM Building			
1.	Tulsi	Ocimum santum	1
2.	Kuksim	Vernonia cinerea	Numerous
3.	Grass	Cynodon dactylon	Numerous
4.	Fish tail Palm	Caryota sp	8
5.	Golden edge	Duranta erecta	Numerous
6.	Tridhara	Tridax procumbens	Numerous

Well maintained garden with green play ground has added beauty to our college and boosts for the healthy & pollution free climate for everybody on the campus. Medicinal and plant garden has established in the college campus and hostel with proper maintenance by the gardener. Around 150 known and rare plant species are maintained in the college campus and medicinal garden with their labelling. In our college we are having huge green sprinklers for natural beauty. Hence, we are given name our campus as "*Green Campus*"



Fig: Green corridors and indoor plants improve air quality in campus buildings.



Fig: Botany Department Students' Plantation Program

Suggestions for Future Development of a Green & Clean Campus:

- 1. Enhance campus greenery by increasing tree and medicinal plant plantations.
- 2. Increase and optimize the solid and liquid waste management capacity.
- 3. Implement another unit of water-harvesting plant systems.
- 4. Adopt eco-friendly management practices.
- 5. Promote organic farming to support nature and the environment.
- 6. Establish a pollution-free zone.
- 7. Raise awareness about cleanliness and the maintenance of flora and fauna.