GREEN AUDIT REPORT

2021-22

Mazbat College, Mazbat,

District-Udalguri, BTR, Assam-784507

Prepared by

Department of Economics

Audited By

Department of Botany and Zoology
LOKD College, Dhekiajuli

Submitted to

IQAC, Mazbat College

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MAZBAT COLLEGE
Mazbat, Udalguri, B.T.A.D.

LOKANAYAK OMEO KUMAR DAS COLLEGE

SCIENCE FORUM

Accredited by NAAC (Second Cycle) B+

DHEKIAJULI, SONITPUR, ASSAM, 784110

E-mail: lokdcollege.444@rediffmail.com

Date:-

CERTIFICATE

This is to certify that Mazbat College has conducted detailed Environmental Green Audit of their campus and has submitted necessary data and credentials for scrutiny. The activities and measures carried out by the college have been verified based on the report submitted and was found to be satisfactory. The efforts taken by the faculty and students towards environment and sustainability are highly appreciated and commendable.

Green Audit conducted by

Dr. Seema Sarkar
Assistant Professor & Head
Department of Botany
LOKD College, Dhekiajuli
District-Sonitpur, Assam

Head,
Department of Botany
L.O.K.D. College

GREEN AUDIT REPORT, 2020-2021

1. Name of the College : Mazbat College, Mazbat, District- Udalguri, Assam-784507

Campus area : 34788 sq. mts

Built up area : 4211 sq. mts

2. Year of establishment : 1988

Brief History:

Mazbat College a pioneer Institution of higher education, is located in Udalguri district of Assam. Established in 1988, with the permission from the Gauhati University, and later affiliated by Gauhati University under UGC Act 1956 under section 2(F). Currently the College is affiliated to Bodoland University. The College is offering a large number of subjects in Arts stream in the Under Graduate Level.

Scope and Goals of Green Auditing:

Green audit serve as a means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities and save money and achieve values of virtue. Once a baseline data is prepared after the auditing process, the data can serve as a point of departure for further action in campus greening. It will also help the college to compare its programmes and activities with other peer institutions, identify areas for improvement and prioritise the implementation of future projects. The data will also provide a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs.

Simple but effective system was devised and applied to prepare a baseline data and monitor the environmental performance of Mazbat College. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

General and Specific Objectives of Green Auditing:

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.

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The specific objectives are:

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

Target Areas of Green Auditing:

Energy Audit:

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

Water Audit:

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

Biodiversity Audit:

All plant and animal species including humans- are linked together in a complex web of life; we depend upon biodiversity for our survival. Biodiversity is the key to healthy ecosystems and ultimately a healthy planet. It keeps the air and water clean, regulates our climate and provides us food, shelter, clothing, medicine and other useful products. Each part within this complex web diminishes a little when one part weakens or disappears.

The trees work hard to keep the air we breathe clean and healthy. Their leaves take in much of the poisonous unwanted carbon dioxide in the air, and replace it with the oxygen we need for healthy living. In this process, the plants with the help of sunlight, water, minerals and the green material called Chlorophyll within the leaves change the carbon-dioxide into food for

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themselves. When doing this they release oxygen into the air which is vital for all life on earth. The roots of trees dig deep into the earth and hold it together so that the rain and wind cannot wash or blow it away. This is very important as the earth has only a very thin layer (seldom more than one foot) of fertile soil covering it.

Biodegradable and hazardous Waste Audit:

This indicator addresses biodegradable waste from college and canteen, paper waste to hazardous wastes of computer laboratory and worn-out electric & electronic goods, and plastic wastes. Hazardous materials represent significant risks to human health and ecological integrity. Hazardous wastes are also leached out through the e-waste generated in the campus. They often persist in the environment leaving a legacy of land and water contamination for generations. They also accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects, and other tragedies. The minimization, safe handling, and ultimate elimination of these materials are essential to the long-term health of the planet.

Audit Stage:

Green auditing was done by involving students supported by teaching and non-teaching staff of the college. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities (lights, taps, toilets etc.) as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and the impact that they have. The staff and learners were interviewed to get details around usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Water, biodiversity and Waste management.

Site Inspection:

Site inspection was done by Faculty and students. The process of green audit was an enriching environmental awareness programme for the students who participated in the green auditing. The experience of green auditing was a first time experience for most of the students. They shared their expectations about a green campus and gave suggestions for the audit recommendations.

Review of documents and records:

Documents such as electricity bills, purchase register, and stock registers were examined and data was collected.

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Review of policies:

Discussions were made with the college governing Body and with the Principal regarding policies on environmental management. The college is very keen in bringing green practices in order to make an environment friendly centre for learning and research. The management is eager to understand the measures practised in disposal of hazardous waste and better waste disposal or recycling methods possible. The management is keen in installation of renewable energy sources and hence bring down the excessive cost and wastage of financial resources.

Audit teams:

Teams for various auditing were formed in order to collect information and map the electrical and water equipment's and devices used in various buildings and campus premises. Flora and fauna diversity were identified and listed. Water outlets fixed in the college garden, playground and in every nook and corner were identified and marked in order to find out its quantity used and frequency of usage.

Post Audit Stage

Energy Usage (Approx.)	
Electricity charges	Rs 12000/ month
Cost of Gas cylinders	Rs 1150 / month
Cost of generator fuel	Rs 3000/ month

Checklist of electrical equipments in college

No.	Devices	No.
1.	Number of CFL bulbs	1
2.	Number of Incandescent bulbs	4
3.	Number of LED bulbs	78
4.	Fluorescent Tube lights	41
5.	LED Tube Light	83
5.	Fans	136
6.	ACs	1
7.	Computers	38
8.	Water pump	7
9.	Photocopier	2

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10.	Printers	6
11.	LCD projector	7
12.	Television	1
13.	Number of inverters	3

A hybrid source of energy comprising solar type of non-conventional category of energy will be a good energy management system for the college. It has been noticed that college already installed Solar Panels. A talk regarding On Grid Power supply with APDCL is going on.

Electricity charges per month are Rs.12000.00. Awareness programmes for the stakeholders to save energy may also increase sustainability in the utilization of various energy sources. Although staff are encouraged to switch off their own lights, monitors and other equipment, the college administrative staff should carry out a lock down of the building at the end of every day and switch off any lights or equipment that have been left on. The College should improve its monitoring and reporting of energy usage and provide information to campus users.

Another important source of alternative energy source is solar power. No greenhouse gas emissions are released into the atmosphere when one uses solar panels to create electricity. And because the sun provides more energy than we'll ever need, electricity from solar power is a very important energy source in the move to clean energy production. College has to consider accelerating the process of moving towards Solar Energy since solar panels had been installed already.

Older wiring if necessary has to be replaced. The college is nearly 32 years old, therefore wiring maybe replaced from electricity leakage and to protect college and its appliances from potentially dangerous or expensive damage that may arise due to faulty wiring.

Existing energy management methods in the campus:

Older and damaged equipment's are replaced if necessary.

Wiring and electrical maintenance are periodically monitored and replacements are made.

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Water Usage

Drinking water filtration facility installed	02
Number of toilets	17
Number of toilet flush's	17
Number of urinals for boys	12
Number of water taps	28
Number of wash basins	07
Quantity of water pumped	1500 ltr

Water Audit (approx)

Activity	**Water used per activity (litres)**	**Number oftimes activity done each day**	**Average water used by a person each day (litres)**
Hands & face wash	0.75 litres	2 times a day	1.5 Litres
Toilet flush (Staff)	3 litres	2 times a day	6 Litres
Toilet (students)	2 litres	2 times a day	4 Litres
Drinking (cup)	0.5 litres	2 times a day	1 Litre
College garden	100 litres/day	Once a day	100 Litres
Total			**112.5 Litres**

The water audit was done during the second week of February where the usage of water is at the peak. The main source of water is ground water.

Leakage has to be prevented and various other sources of water need to be found out as well. Drip irrigation should be practiced in gardens.

A major preference to the recycling of water may be adopted in the college for an efficient water management. Awareness programmes for the management of sustainable water use will be highly efficient in this college. Efficient water saving devices should be installed in all toilets. New toilets that are to be installed should have a dual flush system in place. Water management systems are to be introduced in the urinals. Some alternatives include spray taps, which can save about 80% of water and energy used for hand washing.

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Existing water management methods installed in the campus:

1. Rain water harvesting system has been installed.
2. Ponds in the campus work as Water reservoir.
3. Water conservation and green awareness campaigns have been conducted on behalf of Eco Club.
4. More greenery has been added consistently in order to improve ground water resource.

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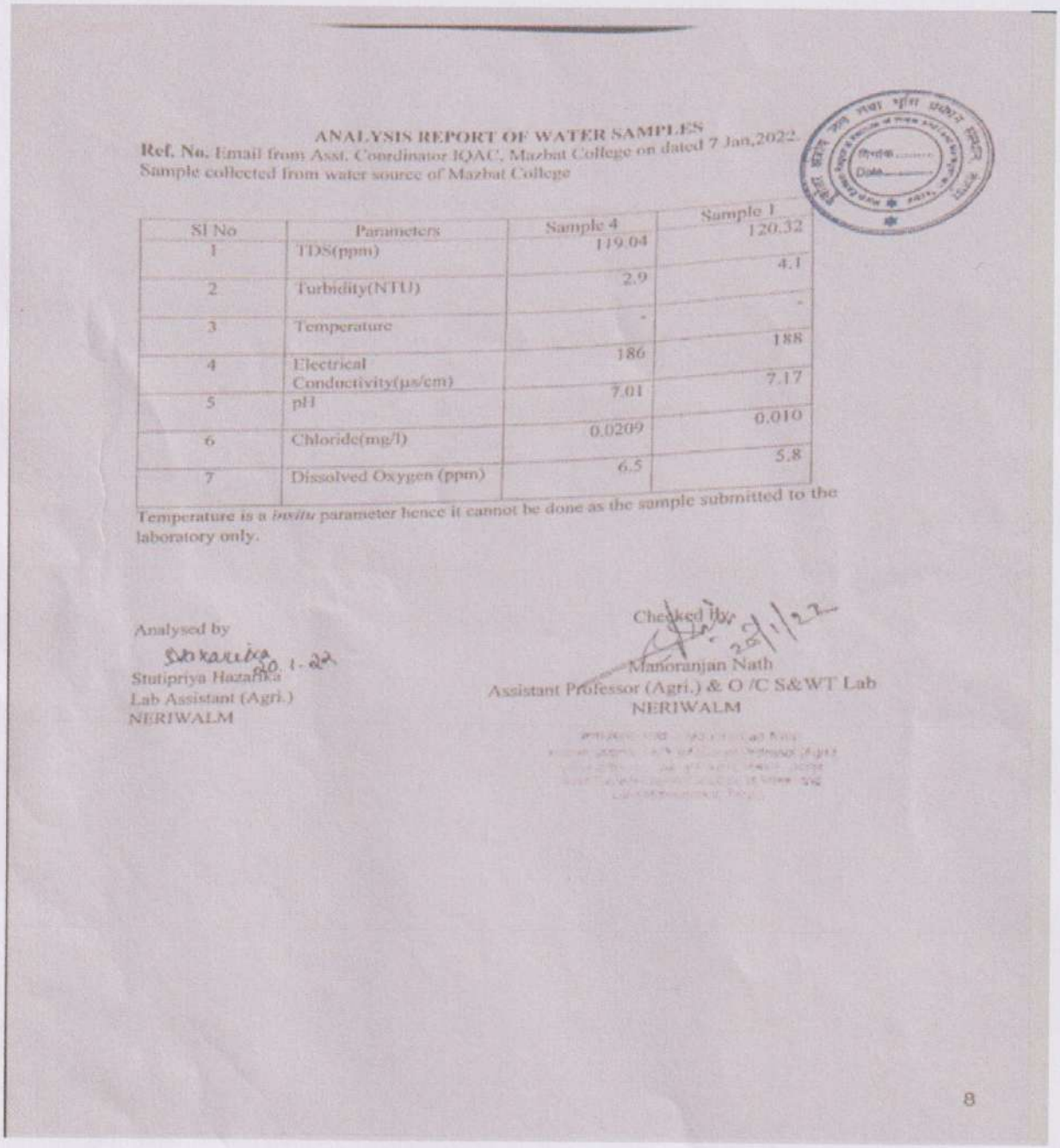
Analysis of Water Samples of Mazbat College.

Report prepared and analysed by NERIWALM, Tezpur, Assam, India



ANALYSIS REPORT OF WATER SAMPLES

Ref. No. Email from Asst. Coordinator IQAC, Mazbat College on dated 7 Jan,2022.
Sample collected from water source of Mazbat College

Sl No	Parameters	Sample 4	Sample 1
1	TDS(ppm)	119.04	120.32
2	Turbidity(NTU)	2.9	4.1
3	Temperature	-	-
4	Electrical Conductivity(µs/cm)	186	188
5	pH	7.01	7.17
6	Chloride(mg/l)	0.0209	0.010
7	Dissolved Oxygen (ppm)	6.5	5.8

Temperature is a *in-situ* parameter hence it cannot be done as the sample submitted to the laboratory only.

Analysed by
Stutipriya Hazarika
Lab Assistant (Agri.)
NERIWALM

Checked by
Manoranjan Nath
Assistant Professor (Agri.) & O /C S&WT Lab
NERIWALM

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Four samples were collected from different water sources and out of four two reports were analysed by NERIWALM officials.

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Waste measure and its disposal:

- Total Stakeholders –1300
- Class rooms –11
- Other rooms –24
- Number of Garbage dumps – 06
- Number of toilets - 26
- E-wastes- computers, electrical and electronic parts – Disposal by selling
- Plastic waste- Burning, dumping pit
- Solid wastes – Damaged furniture, paper waste, paper plates, food wastes
- Waste water – Washing, urinals, bathrooms
- Sanitary Napkin incinerator - 1

Quantity of waste generated:

- Bio degradable – 1 kg/day (office)
- Non bio degradable – 0.5 kg/day (office)
- Bio degradable – 0.3 kg/day (lab)
- Non-bio-degradable – 0.5 kg/day (lab)
- Canteen waste (biodegradable)– 14 kg/day
- Non-biodegradable – ½ kg/day

Waste:

- Biodegradable waste = 24 kg/day
- Non-biodegradable waste = 2 kg/day

A composting pit is highly essential for the treatment of bio degradable waste generated from the canteen, food leftover by students and staff, office and from the college campus cleaning process.

Different methods such as pit composting, vermi-composting, bacterial composting using bacterial consortium may be used to treat the bio degradable waste. E-waste, plastic, glass, tin waste etc. generated from the college can be collected properly and may be handed over to the local self-governments for proper disposal or else college should install proper chemical disposing unit. E-waste, plastic and glass bottles, other plastic wastes, cans, broken glass wares, tins etc., may be recycled or sold out.

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The College has missed few major recycling opportunities, with the exception of food waste from the dining halls and installation of sanitary napkin incinerator at Girls' Common room. Different coloured bins maybe placed in order to collect and segregate various types of waste. Training and campaigns in cotton bag making for students and staff will reduce use of throw away plastic carry bags. Periodical training in health & hygiene, waste management and disposal, green healthy practices may inculcate a positive attitude for a clean and healthy living.

Existing waste management methods practiced:

- Cleaning the campus on daily basis.
- Segregation of waste into degradable and non-degradable by the cleaning staff.
- Waste bin's in placed in corridors, office and staff rooms.
- Incinerators to burn sanitary napkins.
- Paper waste for recycling.
- E-waste and plastic waste disposal at VCDC collection centre.
- Campaigns for reduce, reuse and recycle by Eco club and NSS.

Greenery in Campus:
Total list of campus plant species identified –

List of Plants seen in College Campus during Audit

SL No	Scientific name of the plant	Local/Common name	Family	Uses
1	*Acacia melanoxylon*	Australian acacia	Mimosaceae	Social Forestry
2	*Cassia grandis*	Cassia	Fabaceae	Ornamental plants
3	*Cassia javanica*	Cassia	Fabaceae	Oranamental plants
4	*Grevillea robusta*	Silver oak	Proteaceae	Ornamental forestry
5	*Cassia abbreviata*	Cassia	Fabaceae	Ornamental plant
6	*Delonix regia*	Gulmohar	Fabaceae	Edible, Ornamental plant
7	*Gmelina arborea*	Gamhar	Liliaceae	Medicinal plant
8	*Magnolia champaca*	Champa	Magnoliaceae	Ornamental tree
9	*Terminalia chebula*	Xilikha	Combretaceae	Timber, Medicinal

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10	*Ficus sycomorus*	Dimoru	Moraceae	Traditional uses
11	*Ficus glomeruta*	Dimoru	Moraceae	Traditional uses
12	*Samane asaman*	Rain tree	Fabaceae	Shade tree
13	*Rauwolfia caffra*	Sarpagandha	Apocynaceae	Medicinal plant
14	*Mesua ferrea*	Nagchampa	Calophyllaceae	Medicinal plant
15	*Terminalia arjuna*	Arjun	Combretaceae	Medicinal plant
16	*Sasa palmata*	Broadleaf bamboo	Poaceae	Shade plant
17	*Tabernemontana divaricata*	Pinwheel flower	Apocynaceae	Medicinal plant
18	*Phyllanthus emblica*	Amlokhi	Phyllanthaceae	Fruit ,edible
19	*Carica papaya*	Papaya	Euphorbiaceae	Fruit,Young leaf,edible
20	*Thuja orientalis*	Thuja	Coniferae	Ornamental plant
21	*Morus nigra*	Mulberry	Moraceae	Medicinal plant
22	*Azadiractha indica*	Neem	Meliaceae	Medicinal plant
23	*Dypsis lutescens*	Areca palm	Arecaceae	Ornamental plant
24	*Pinus sp*	Pine	Pinaceae	Timber plants
25	*Polyalthia longifolia*	Debadaru	Annonaceae	Ornamental plant

LIST OF FAUNA FOUND WITHIN MAZBAT COLLEGE

Invertebrates:

Sl No.	English Name	Scientific Name
1	Earthworm	*Pheretima posthuma*
2	Leech	*Hirudinaria granulosa*
3	Honey bee	*Apis indica*
4	Butterfly	*Lepidoptera sp.*
5	Cockroach	*Periplanata americana*
6	Apple snail	*Pila globosa*

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7	Stick insect	*Ctenomorphodes chronus*
8	May Fly	*Rhithrogena germanica*
9	Wasp	*Ropalidia marginata*
10	Grasshopper	*Poekilocerus pictus*
11	Gray Leaf insect	*Phyllium pulchriphyllium*
12	Fruit Fly	*Drosophila melanogaster*
13	House Fly	*Musca domestica*
14	Dragon Fly	*Sympetrum flaveolum*
15	Mosquito	*Culiseta longiareolata*

Vertebrates:

Sl No.	English Name	Scientific Name
AMPHIBIA		
1	Toad	*Bufo melanostictus*
2	Indian Skipping Frog	*Euphlyctis cyanophlyctis*
3	Ornamented pygmy frog	*Microhyla ornate*
4	Indian Bullfrog	*Hoplobatrachus tigerinus*
5	Leaf Frog	*Hylarana tytleri*
6	Frog	*Rana tigrina*
REPTILES		
1	Garden Lizard	*Calotes versicolor*
2	House Lizard	*Hemidactylus frenatus*
3	Monocled Cobra	*Naja kaouthia*
4	Branded Krait	*Bungaras fasciatus*
5	Stripped Keelback	*Amphiesma stolatum*
6	Water snake	*Enhydris enhydris*

7	Ornate Flying Snake	*Chrysopelea ornata*
8	Common Wolf Snake	*Lycodon aulicus*
9	Rat Snake	*Ptyas mucosa*
10	Checkered Keelback	*Xenochrophis piscator*
AVES		
1	Barn Owl	*Tyto alba*
2	Cattle Egret	*Bubulus ibis*
3	Red Vented Bulbul	*Pycnonotus cafer*
4	House Crow	*Corvus splendens*
5	Spotted Dove	*Spilopelia chinensis*
6	Indian Pond Heron	*Ardeola grayii*
7	House Sparrow	*Passer domesticus*
8	Small Indian Kite	*Milvus migrans govinda*
9	Red – wattled Lapwing	*Vanellus indicus*
10	Rock Pigeon	*Colomba livia*
11	Koel	*Eudynamys scolopaceus*
12	Common Kingfisher	*Alcedo atthis*
13	Hill Myna	*Gracula religiosa*
14	Common Myna	*Acridothres tristis*
15	Open bill stork	*Anastomus oscitans*
16	Indian woodpecker	*Melanerpes superciliaris*
17	Rose ringed parakeet	*Psittacula krameri*
MAMMALS		
1	Indian palm squirrel	*Funambulus palmarum*
2	Monkey	*Rhesus macaque*

3	Rat	*Rattus norvegicus*
4	Bat	*Pteropus medius*
5	Indian mongoose	*Herpestes edwardsii*

Conclusion and Recommendations:

Green Audit is the most efficient way to identify the strength and weakness of environmental sustainable practices and to find a way to solve problem. Green Audit is one kind of professional approach towards a responsible way in utilising 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 considers 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 actions and become a more sustainable institution.

Suggestions:

Some of the very important suggestions are:-

1. Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
2. Increase recycling education on campus.
3. Increase Awareness of Environmentally Sustainable Development- Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
4. Educate for Environmentally Responsible Citizenship- Establish programs to produce expertise in environmental management, sustainable economic development, population and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.

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5. Practice Institutional Ecology-Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
6. Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.
7. Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
8. Increase reduce, reuse, and recycle education on campus.

Recommendations:

1. Installation Biogas plant and Compost units.
2. Solar panels to be made functional soon to generate electricity.
3. Dig more rain water pits in the 30 acre campus wherever possible and maintain it regularly.
4. Set up water recycling unit where the recycled water can be used for gardening in college.
5. Grow up vegetable garden and medicinal garden and gradually develop it as a nursery.
6. Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
7. Display boards of fauna diversity to generate enthusiasm for learners.
8. Organize earn while learn eco-friendly programmes like jute bag making, paper plates making etc.
9. Conduct seminars, workshops and exhibitions on environmental education.
10. Establish water, energy and waste management systems.
11. Avoid plastic/thermocol plates and cups in the college level or department level functions.

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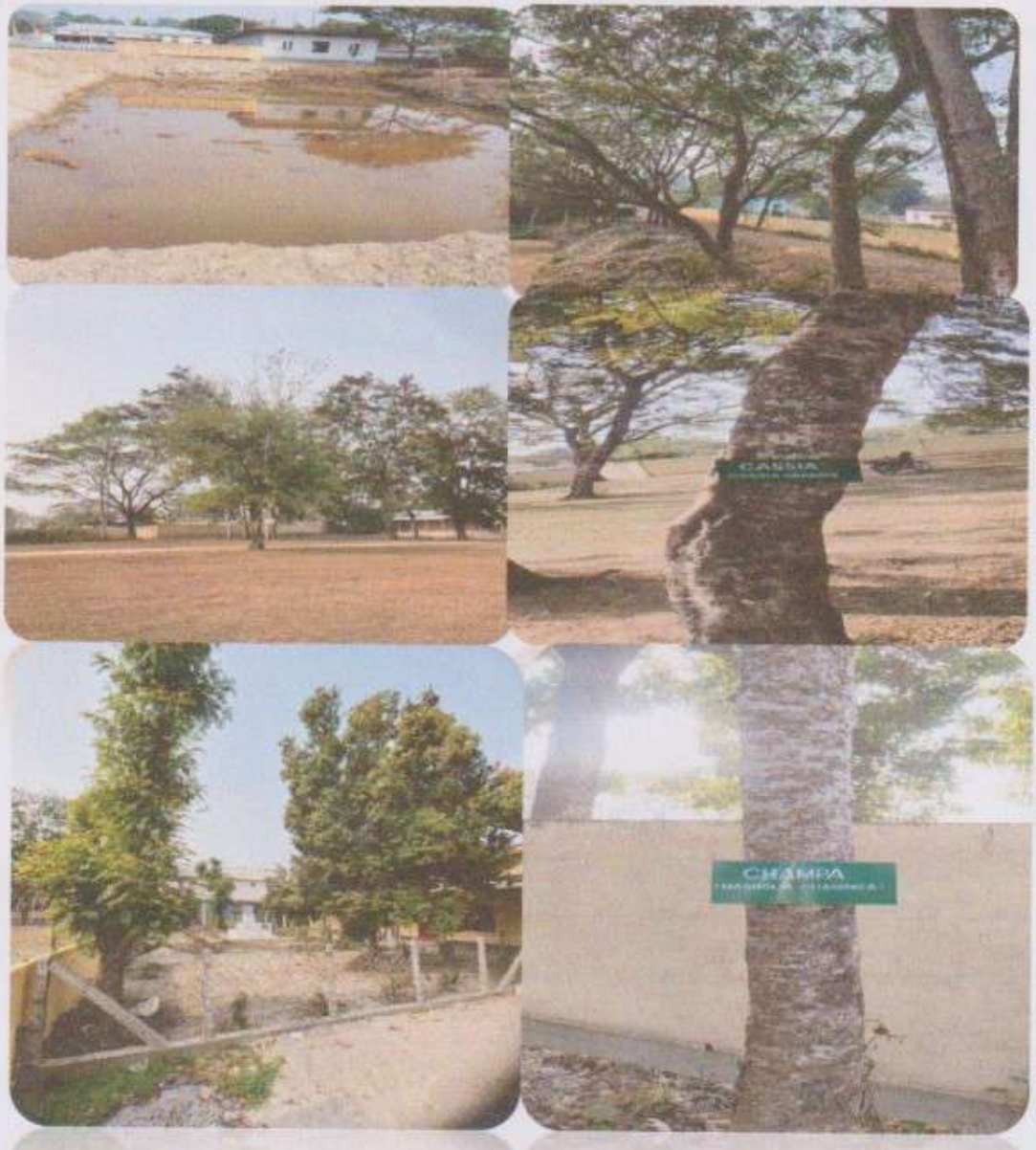
Campus Photos regarding green initiatives



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