

## 7.1.6 Quality audits on environment and energy

### *CONTENTS*

1. Overview
2. Objectives of the green audit
3. Introduction
4. Methodology
5. Survey of the Flora and Fauna of the campus
6. Water management audit
7. Sound pollution audit
8. Renewable Energy audit
9. Waste management audit

### **Introduction**

Rangia College was established in the year 1963. From the inception of the college has scenic beauty. The college continues to focus to keep the greenery of the campus. To enhance the greenery of the campus, the college makes plantation a habit. A Verity of species is planted in different areas of the campus. The following initiative has been taken by the authority

- a. There are approximately 150 varieties of species on the campus. All plants have been labeled with local and scientific names.
- b. The sericulture garden is converted as ECO Zone. A variety of butterfly and migratory birds, insects have visited the ecozone making a hot spot of Flora and Fauna for the students especially studying live science. The botany department uses the reach biodiversity elements for its practical and project work.
- c. A Botanical garden under the Department of Botany is under construction.

- d. A pond at the entrance of the college campus enhances biodiversity with the presence of a variety of fish, amphibians, reptiles, etc. It also gives shelter to many watery bodies of the campus.
- e. The cleanness of the campus and good drainage system keep the campus clean.
- f. World environment day and environmental-related seminars, popular talks are organized in the campus.
- g. Environmental Studies is a compulsory subject for first-semester students. Therefore, environmental classes are regularly taken by the departments.
- h. The campus has been declared a Tobacco-free zone. The initiative has been taken to reduce the use of paper in official work by digitalizing the administration.
- i. To aware the students of the college towards the plantation a project named “ My Plant My responsibility" has been running since 2017. In this project, a student is asked to plant a tree and look after the same during his stay in the institution. In this regard, the college published a booklet (log book) to help the students to record the development of the plan and thereby develop a relationship with the plant as well as the environment.

### **Over view of Green Audit**

Green Audit is a process of systematic identification, quantification, recording and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green audit can be a useful tool for a college to determine

Φ. The type and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Φ. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self enquiry is a natural and necessary outgrowth of a quality education

Φ. It could also be stated that institutional self enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future.

Φ. To generate awareness among the students on environmental sustainability as it is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent

### **Objectives**

In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep campus environment clean since its inception. The purpose of the present green audit is to identify, quantify, describe framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are

1. To develop ethics value system among the students on Environmental sustainability.
2. To enhance the curriculum of Environmental Studies.
3. To improve the environmental standards.
4. Reduction of financial expenditure
5. Lay out map marking the open areas of the college.

### **Methodology**

The methodology include:

- Φ. Physical inspection of the campus
  - Φ. Observation the environmental component sites
- Φ. Documentation
- Φ. Report preparation.

### ***Environmental awareness initiatives taken by the College.***

- Φ. IQAC published a handbook titled “ My Plant My Responsibility” to aware students of environmental issues.
- Φ. Programs have been organized like plantation, a related day observed, cleanliness of the campus etc.

Φ. Labeling, maintaining the Botanical garden and five gardens are lookup by the Department of Botany, NSS, and Bharat Scout and Guide.

Φ. Pond at the entrance is a rich biodiversity ecosystem. Students used the resource for academic purposes.

**Observation**

Layout map of the college



**Land used data**

Areas	Open area	Latitude	Longitude
14.28	5.12	91.61401	26.42725

**Flora Fauna of the campus**

The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation

programme's organized by the authority and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people aroundof the college in terms of contributing to our environment by providing oxygen, improving air quality,climate amelioration, conservation of water, preserving soil, and supporting animal species.



Green Campus of the College

The Fauna Diversity of Rangia College studied by Department of Zoology and documented as follows

<b>Fauna Group</b>	<b>Scientific name</b>
Spider	Myrmachne orientalis (Family Salticidae); Nephila plipes(Family-Nephilidae); Heteropoda sp (Family-Sparassidae); Phintella vitatta (FamilySalticidae)
Other insect	Scarlet dragonfly; Pantala flavescens (wandering glider), grasshoppers, microbes
Moth and Butterfly	Antheria assmensis;Bombyx mori;Philosamia ricini; Junonia atlites atlites ; Commander (Moduza procris procris);Ethope himachala ; Melanitis leda leda ; Paltoporia paraka paraka; Ypthima baldus ; Acraea terpsicore ; Elymnias hypermnestra undularis;Mycalesisperseusblasius;Tanaecialepidealepidae; Euploea core core
Birds	Acridotheres tristis (Common myna); Streptopelia orientalis (Oriental Turtle Dove); Athene noctua ( little owl ); Pycnonotus cafer (Red-vented Bulbul), crows, sparrows.
Reptile	squirrels, mouse, snake, lizard

### ***Water Audit***

The average rainfall of Assam is 2,818mm. The rainy season of Assam are from April to September with 361mm of precipitation.

Q Rain recharge the two ponds located inside the campus.

Φ. Rainwater harvesting plan provides water in the toilets inside the campus.

Φ. Outlet of the rainwater used to resurge the groundwater in the ECO Zone park.

### ***Report of the water of the samples***

1. Pond at the entrance of the college gate
2. Pond near the eco zone park
3. Water of the bore tube well

	<b>Sample 3</b>	<b>Sample 2</b>	<b>Sample 1</b>
Colour			
pH / 6.5-6.8	7.1	A/F	A/F

Iron	0.22
Alkalinity	166
Turbidity	2.5
Calcium Hardness	11.22
Total dissolve solid	160
Chloride	76.57
Floride	0.58
Total Hardness	70
<b>Nitrates</b>	<b>71</b>

### **Noise Level of campus**

Φ. Majority of students come from the local city and around a 10 km radius of the subdivision.

The most common vehicle used is bicycle, motorbike and e rickshaw

Φ. The most common vehicle used is the bicycle, motorbike and e rickshaw. Stands are provided for bicycles and motorcycles. Strict restrictions are given not to blow horns inside the college campus.

Φ. Big trees in front of the college campus reduce the sound pollution due to the railway track 500mt from the main gate

### **Solid Waste management**

Initiatives have been taken under the aegis of the institution for the management of the different types of waste, both degradable and non-degradable,.

For solid waste management, there are two concrete dustbins. One is set behind the library of the institution and another one has been kept behind the college canteen.

Liquid waste has been tried to manage through the construction of proper drainage facilities.

Regarding e-waste management, there is a committee that handles the whole task of e-waste management. e-waste is auctioned every year is one-way help in managing the issue also provides an earning source for the institution.

In the case of liquid waste generated in the chemical laboratory, they are separated as a chlorinated and non-chlorinated solvent which can be reused. Further biodegradable solid waste is reused as organic fertilizer through vermin-composting.

The effluents/ liquid waste from chemicals used in the laboratory Chemistry/ Botany/ Zoology are treated scientifically by making a leak-proof sanitary tank so that the toxic metals/ chemicals reagents cannot percolate through the soil in the surrounding areas. The non-biodegradable solid

wastes like plastics, cups, etc. generated on the college campus are burnt through incineration. The biodegradable part like herbs, plants, etc. generated in the college are used as manure by vermin composting.

Type of Waste	Disposal Method	Remarks
<b>E-waste</b> <b>Quantity:</b>	Collected in stores room	Collected by
Solid Waste		
<b>Bio-degradable</b> Organic Waste	Dumped into the composed pit	Decomposed organic matter will be used as manure to the plants in the campus.
Inorganic waste Chemicals, glass	Earthen pits	Precautions have been taken while disposing
Electrical waste Tube lights, bulbs, wires.	Keep in store room	
Timbers Furniture scraps, Sanitary Waste	Keep in store room	Reuse as per requirement
Scrap equipments	Kept in store room	Sold collected mass.
Equipment waste	Kept in store room	Sold to vendors

### Renewable Energy initiatives

- Φ. Four solar panel pole has been installed in specific locations.
- Φ. Rainwater harvesting plan provides water in the toilets inside the campus.
- Φ. Outlet of the rainwater used to resurge the groundwater in the ECO Zone park.

### Energy Audit

In the present study, college electricity audit has been done. In this study considered practical laboratory, instrument, Fans, air conditioners, Computers etc are considered in this study. We have studied total budget of the college, total economic investment of college on the electricity

Sr. No.	Month	Amount paid(RS)	Consumption Unit (KWhr)



1	July 2020	14,712.00	1421
2	August 2020	20842.00(A)	25.38
3	September 2020	26,418.00	51.76
4	October 2020	34243.00(A)	--
5	November 2020	69,445.00	4282
6	December 2020	34,385.00	4262
7	January 2021	39,419.00	4888
8	February 2021	59,136.00	3561
9	March 2021	75,330.00(A)	--
10	June 2021	94,323.00	1804
Total Power Consumption in Yearly		<b>3,37,838.00</b>	<b>~20.294</b>
Average Power Consumption in Monthly			<b>~1600</b>

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