TINSUKIA COLLEGE

TINSUKIA, ASSAM

GREEN AUDIT

(2020-21)

Prepared By

IQAC, TINSUKIA COLLEGE

Green Audit
Tinsukia College
Tinsukia, Assam

1. Introduction:

The term Green acronymically is called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The green audit practically involves energy conservation, use of renewable sources, rain water harvesting and water conservation, efforts of carbon neutrality, plantation, hazardous waste management & E-waste management. The concept of green audit can be used as a management tool to evaluate the environmental standards; thereby can perform better and better for the sustainable development of the organization. It is necessary to conduct a green audit in college campus because student should be aware of it, its advantages to save the planet & they become good citizen of our country. Green audit and sustainable development is intricately related to each other. Strong green audit process facilitates sustainability and help to reduce the wastage

2. About the College:

The inception of Tinsukia College in the Year 1956 was the result of strenuous efforts of Late B. K. Saraswatji. Before the college came to be located in the present premises at Kachujan, in 1961 it started out in the present premises of Senairam Higher Secondary School on the 1st September, 1956. The College was started as an Arts college initially at intermediate level but in the very next year Commerce Stream was also introduced. In 1957 itself the college was upgraded to Degree Level. The year 1964 has a special significance in the annals of Tinsukia

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College when Science Stream was also added making it a full fledged multi- faculty degree college. For an Institution to rise to this level within eight years of its inception is a feat in itself. Till 1964, the college conducted courses under the auspices of Gauhati University but after establishment of Dibrugarh University in 1965, it was brought in to the jurisdiction of the said University. The College had been running on public contribution and generous donation from philanthropist till 1962 but in 1962 the college was accorded the status of "Deficit Grant-in-Aid" college which enabled it to receive financial grants from the Govt. of Assam. Later on in 1969, the College was recognized by the University Grant Commission, New Delhi, which resulted in receipt of planned financial assistance from UGC for various development schemes. Few years back, the Govt. of Assam took a historic decision to provincialise all deficit grant-in-aid Colleges with effect from 1st December 2005. Now the College enjoys the status of "Provincialised College".

The College grew from strength to strength on the merit of its students, the dedication of its teachers and the vision of the Principal. An Institution which began its academic endeavour with four faculties and handful of students; has correctly a student enrolment of more than 2500 and faculty strength of more than seventy. This co-ed Institution has been imparting education both at higher Secondary and Degree Levels in five faculties of Arts, Science, Commerce, Management (BBA) and Computer Application (BCA). It has altogether seventeen regular teaching departments and two professional degrees and a number of Certificate Courses. In addition to that Krishna Kanta Handique State Open University Study Centre at the College premises is offering a wide range of choice to students.

The College has an infrastructure built on a sprawling campus covering an area of about 18 Bighas. The facilities include a big Library, well Stocked with Books and journals, Photocopiers, Computers well equipped Laboratories, Girls Hostels, a large auditorium Canteen, a garden with canopies etc. As per the recommendation of NAAC and Internal Quality Assurance Cell is in place to improve quality of education and support services offered by the college to its stakeholders.

The college has produced illustrations of alumni who have occupied distinguished positions in various spheres and eloquent testimony to the calibre of education imparted by this college. They are eminent scientists, industrialist, academician, politicians, corporate heads, doctors, engineers, chartered accountants, lawyers, writers, artists and performing

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artists. The college has a permanent alumni association which has initiated several steps for the all around development of the college.

3. Objectives:

The main objectives of a green audit are to promote the Environment Management and Conservation in and around the College Campus.

The main objectives of carrying out Green Audit are:

- To bring awareness amongst students about the real concerns of the environment and sustainability
- To preserve the environment and mitigate the threats paused to the health of living beings.
- To bring out a status report on environmental compliances.

4. Methodology:

The methodology of Green Audit includes different tools such as, physical inspection of the campus, observation and review of the documentation, interviewing stakeholders, measurements, data analysis and recommendations. The study covers the following areas:

- Energy Conservation
- Water management
- Waste management
- E-waste management
- Green area management

5. Observations and Recommendations:

5.1 Energy Use and Conservation:

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

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Tinsukia College obtains the electric power from APDCL, Govt. of Assam and its own generations from solar panels and Generators. Presently, the college consumes about 4000 units and out of which 25 Units are generated for the solar panel. During power cuts by ASEB, Tinsukia, our College maintains its power supply from two Generators of capacities 10 KVA & 40 KVA installed within the campus. Most of the energy is used in lighting the Campus as well as the Office, Class rooms and Laboratories. Besides, our college consumes electric energy for ACs, Computers, Fans and Scientific equipment. Considering the economic standpoint of energy, our college uses CFL and LED bulbs. In addition to these there are few solar-powered lights to illuminate the campus.

Observations:

Energy source utilized by the campus is mostly the electricity supplied by APDCL. Yet a small part of total consumption is compensated by solar energy. CFL & LED bulbs, Neon as well as LED tubes are used to illuminate class rooms, seminar halls, verandas and campus. In comparison to the total area of academic and administrative blocks, library, girls' hostel, less number of AC's are used for cooling as the campus naturally cooled due to sufficient greenery.

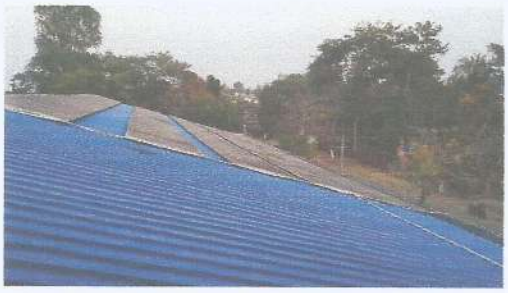

Fig. 1.a: Solar Panel of Tinsukia College

Fig. 1.b: Solar Panel of Tinsukia College

Fig. 1.c: Solar Lamp of Tinsukia College

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Recommendations:

- Supply of electricity to the classrooms, administrative block should be shut down from the other parts of the main building after occupancy time for saving electricity
- More renewable sources of energy such as more solar panels should be installed for energy supply.
- Installation of LED lamps instead of CFL and replacing the old tube lights with the new LED tubes.

5.2 Water Uses:

This indicator states water consumption, water sources, irrigation, storm water. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

Observations:

The major sources of water in the College campus ~~is~~ are ground water procured by bore wells and stored in reservoirs. Water is mainly used for drinking, conducting practical in the laboratories, bathroom, toilet and gardening. The average water needed in the college is about 20,000 litres per day. Lots of UV and RO filters have been installed for drinking purposes in the entire department, teachers' common rooms, library and college canteen. Besides, a large cooler cum filter is installed for common use, especially for students. Microbial and Physicochemical analysis of water samples from college campus and surrounding areas had been carried out and the findings are attached in annexure-1.

Recommendations:

- Since there is enough rainfall in this region during the monsoon, rain water harvesting may be introduced by installation of rain water harvesting units in the campus.
- Care should be taken to avoid culminating wastage of both water and electrical energy due to overflow from reservoirs and misuse of running water.
- The spent water from the RO installations should be reused for purposes such as gardening, in the washroom etc.

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- Water testing should be carried out in a regular interval of every five years for finding the change in quality of water.

5.3 Waste Management:

This indicator specifies waste production and disposal of different wastes both biodegradable and non-biodegradable such as paper, food, plastic, construction, glass, dust *etc*. Besides, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. This survey focused on volume, type and current management practice of waste generated in the campus.

Observations:

Waste generation from tree foliages and lawn management is a major solid waste generated in the campus. The other waste generated is segregated at source by providing separate dustbins for biodegradable and non-biodegradable. The waste generated by newspapers, magazines, cartons and examination oriented waste are stored in the proper places and disposed of from time to time. The plastic waste generated in the college office, canteen, and departments and overall in the campus is regularly put in the 'plastic bank'. Metal waste, concrete waste and wooden waste are stored and given to authorized scrap agents for further processing. Twin bins are installed at different places in the campus to dispose of waste of the two categories, (i) degradable and (ii) non-degradable, separately. Biodegradable waste from the filled in bins are then dumped in pits. Personnel from the local Municipal Board collect the non-biodegradable wastes on every weekend. Two vermi-composting plants had been initiated by the college.

Recommendations:

- Take initiatives to reduce all kinds of waste that is produced in the college campus.
- Make an arrangement for recycling facilities from the authorized body or install at least one recycling unit.
- Take initiatives to make the campus plastic free.
- Awareness campaigns should be conducted from time to time to make everyone in the campus aware of hazardous impacts of waste and minimize the same.
- Important and confidential papers after their validity to be sent for pulping.

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5.4 E-Waste Management:

E-waste is described as the electrical or electronic equipment that's been discarded. This includes working and broken items that are thrown in the garbage or donated to a charity reseller. E-waste is particularly dangerous due to toxic chemicals that can damage human health and the environment.

Observations:

E-waste generated in the campus is very less in quantity. The E-waste and defective item from the computer laboratory are being stored properly. E-waste is stored and given to authorized scrap agents for further processing.

Recommendations:

- The lifespan of all electrical and electronic appliances should be prolonged in order to avoid the generation of E-waste.
- Annual Maintenance Contracts should be signed with the authorized dealers for regular maintenance of these equipments.
- The institution should contact approved E-waste management and disposal agencies for safe disposal of E-waste in a scientific manner.

5.5 Green area management:

This indicator includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

Observations:

The campus and nearby areas of the college play an important ecological role within the campus and also the adjoining areas. The college celebrates days like the World Environment Day, Biodiversity Day, World Sparrow Day, and Ozone Day with great importance to generate awareness among the students, faculties as well as staff members under the banner of Environment and Climate Cell. Popular talks on environmental problems are organized.

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Our college has started a vermi-composting Plant. The main purpose of this is to reduce biodegradable waste in the college campus. The compost thus produced is used in the floricultural activities within the campus. The main benefit of this process is reducing the waste in the campus and also generating awareness among the students.

Fig. 5.a: A Religious Tree (Wood Apple)

Fig. 5.b: Tree Plantation on World Biodiversity Day

Fig. 5.c: Tree Plantation on World Environment Day

Fig. 5.d: Green House at Botanical Garden

Fig. 5.e: Green Campus Area

Fig. 5.f: Endangered Plants at Botanical Garden

Fig. 5.g: Herbal Garden at the campus

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Biodiversity available in the Campus:

List of plants:

FAMILY	SCIENTIFIC NAME	ENGLISH
Acanthaceae	1. *Graptophyllum pictum*	
Agavaceae	2. *Dracaena fragrans*	
	3. *Dracaena dermensis*	
Alangiaceae	4. *Alangium chinensis* **(Lour.)Rehder.**	
Amaryllidaceae	5. *Crinum jagus*	
Anacardiaceae	6. *Mangifera indica*	Mango
	7. *Spondius pinnata*	
Annonaceae	8. *Polyalthia longifolia* **(Sonn.) Thwaites**	Must Tree
Apocynaceae	9. *Allamanda cathartica* **L.**	
	10. *Alstonia scholaris* **(L.) R.Br.**	Devil's tree
	11. *Cascabala thevetia* **(L.) Benth. & Curz.**	Yellow oleander
	12. *Nerium indicum* **Mill.**	Rosy oleander
	13. *Plumeria accuminata* **R.Br.**	Frangipani
	14. *Rauwolfia serpentina* **(L.) Benth. & Curz.**	Serpentine
	15. *Tabernaemontana divaricata* **(L.)R.Br.**	Wax flower
Araliaceae	16. *Heteropanax fragrans* **Seem.**	
Araucariaceae	17. *Araucaria cookii*	
Arecaceae	18. *Areca catechu* **L.**	
	19. *Calamus viminalis* **Willd.**	
	20. *Caryota mitis*	

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	21. *Livistona chinensis*	
	22. *Livistona genkinsiana* **Griff.**	
	23. *Wettinia hirsuta*	
Angiopteridaceae	24. *Angiopteris evecta*	
Averrhoaceae	25. *Averhoa carambola* **L.**	
Bignonaceae	26. *Spthodea spicata* **Beauv.**	Scarlet Bell/ Indian Tulip Tree
Bixaceae	27. *Bixa orellana* **L.**	
Bombacaceae	28. *Bombax ceiba* L.	Silk cotton
Caesalpinaceae	29. *Bauhunia acuminata*	
	30. *Cassia fistula*	
	31. *Cassia javanica*	
	32. *Delonix regia*	
Caricaceae	33. *Carica papaya*	Papaya
Clusiaceae	34. *Mesua ferrea* L.	Stone Wood tree
Combretaceae	35. *Quisqualis indica*	
	36. *Terminalia curieta* **Roth.**	Combretaceae
	37. *Terminalia cebula* **Retz.**	Chebulic-myrobalan
	38. *Terminalia citrina* Roxb. ex Fleming,	Chebulic-myrobalan
Cupressaceae	39. *Cunninghamia lanceolata*	
	40. *Cupressus arizonica*	
	41. *Juniperus communis*	
	42. *Thuja orientalis*	
Cyatheaceae	43. *Cyathea gigantea*	

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Cycadaceae	44. *Cycas revoluta*	
Dilleniaceae	45. *Dillenia indica* **L.**	
	46. *Dillenia pentagyna* **Roxb.**	
Euphorbiaceae	47. *Codiaeum variegatum*	
	48. *Euphorbia tithymaloides* **L.**	**Redbird flower/ Christmas candle**
	49. *Mallotus tetracoccus* **(Roxb.) Kurz**	Monkey-face
	50. Phyllanthus embelica	
Flacourtiaceae	51. *Flacourtia jangomus* ***(Lour.)Reesh.***	
Lauraceae	52. *Cinamomum zeylanica* **Breyn.**	
	53. *Persea bombycina* **(King ex Hook. F.)Kostel.**	
Lythraceae	54. *lagerstroemia spciosa* **(L.) Persl.**	Indian Lilac
Magnoliaceae	55. *Magnolia hookeri* **(Cubitt. & Smith.)Raju & Nayer**	
Malvaceae	56. *Hibiscus rosa-sinensis* **L.**	China Rose
Marantaceae	57. *Phrynium pubinerve* **Bl.**	
Meliaceae	58. ***Melia azadirach* L.**	
	59. ***Toona chinensis***	
Menispermaceae	60. ***Tinospora sinensis***	

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Mimosaceae	61. *Albizia lebbeck* **Benth.**	Parrot tree
	62. *Albizia odoratissima* **(L.f.) Benth.**	
	63. *Calliandra surinamensis* **Benth.**	
	64. *Samanea saman*	
	65. *Tamarindus indica*	
Moraceae	66. *Artocarpus intergra* **Thunb.**	Jack fruit
	67. *Ficus elastrica* **Roxb**.	Rubber Tree
	68. *Ficus hispida* **L.**	
	69. *Ficus rumphii*	
Musaceae	*70. Heliconia rostrata*	
	71. Musa velutina	
Myrsinaceae	72. *Ardisia elliptica* **Thunb.**	
Myrtaceae	73. *Callistemon linearis* **DC.**	
	74. *Eucalyptus globulus* **Labill.**	
	75. *Psidium gujava* **L.**	
	76. *Syzygium aromaticum* **(L.) Merr.**	Clove
	77. *Syzygium cumini* **(L.) Skeel.**	Black Plum
	78. *Syzygium jambos* **(L.) Alston.**	
Nyctaginaceae	79. *Bougainvillea glabra*	
Oleaceae	80. *Nyctenthes arbor-tristis* L.	Coral jasmine
	81. *Jasminum sambac* **(L.) Aiton**	**Arabian jasmine**
Orchidaceae	82. *Arundina graminifolia*	

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Pandanaceae	83. *Pandannus fascicularis*	
	84. *Pandanus tectorius*	
Papilionaceae	85. *Derris indica* **(Lamk.)Bennet**	
Passifloraceae	86. **Passiflora suberosa L**	**Corkystem passionflower**
Pinaceae	87. *Pinus insularis* **Endl.**	Pine
Poaceae	88. *Bambusa multiplex*	
	89. *Bambusa ventricosa*	
	90. *Dinochola malayana*	
	91. *Saccarum spontaneum*	
	92. *Thysanolaena maxima*	
Porteaceae	93. *Gravellea robusta*	
Rhamnaceae	94. *Zizyphus mauritiana* **Lamk.**	
Rubiaceae	95. *Gardenia angustata*	
	96. *Ixora parviflora*	
Rutaceae	97. *Agele marmelos* **Corr.**	Wood apple
	98. *Citrus medica*	
	99. *Citrus reticulata*	
	100. *Murraya koengii* (L.) Spreng.	Curry Leaf Plant
Sapotaceae	101. *Mimosops elengi* Roxb.	Indian Madler/ Elengi
	102. *Manikara zapota*	
Smilacaceae	103. *Smilax zeylanica* L.	Indian Sarsaparilla
Solanaceae	104. *Brugmansia suaveolens* (Willd.) Sweet	Angel's trumpet
	105. *Solanum torvum* Sw.	

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Strelitziaceae	106. *Ravenala madagascarensis* **J.F. Gme**	Traveller's Tree
Theaceae	107. *Camellia sinensis* **L.**	Tea Tree
Thymeliaceae	108. *Aqularia malaccensis* **Lam.**	
Tiliaceae	109. *Grewa serrulata*	
Verbenaceae	110. *Clerodendrum glandulossum* **Coleb.**	
	111. *Duranta repens* L	
	112. *Gmelina arborea* Roxb.	
	113. *Lantana cámara var. aculeata* **(L.) Mold.**	Lantana
Zingiberaceae	114. *Curcuma aromatica* **Salisb**	Wild turmeric
	115. *Hedychium coronarium* **J. Koenig.**	**White garland lily / White ginger lily**

Recommendations:

- Review periodically the list of trees planted in the campus, allot numbers to the trees and keep records. Assign scientific names to the trees. There should be vernacular names in the floras.
- Ensure that an audit is conducted annually and action is taken on the basis of the audit report, recommendation and findings.
- Celebrate more specific days related to the environment for uplifting awareness of the students.

6. Conclusion:

The environmental awareness initiatives adopted by the college is praiseworthy. The installation of solar panels, vermicomposting plant, herbal garden and plantation are noteworthy. Noble efforts such as new plantation of orchids, medicinal plants *etc.* are undertaken by the administration to make the campus green. A few recommendations are added to further enhance the environmental and sustainability index of the college. This may lead to a prosperous future in the context of a Green Campus & thus sustainable environment and community development.

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As part of systematic green audit of the campus, all the environmental related matters are monitored including illumination and ventilation of the classroom. It was observed that illumination and ventilation is satisfactory.

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